Visual TikZ

Version 0.66

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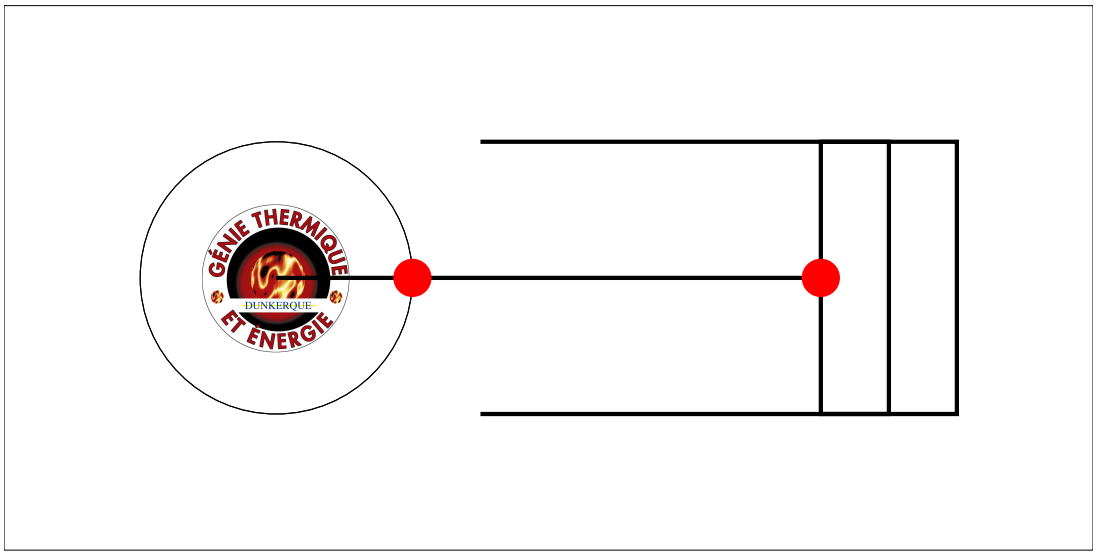
mis à jour le 31 mai 2018



Objectifs :

- Avoir une image par commande ou par paramètre.
- Avoir un texte réduit au strict minimum.
- Etre le plus complet possible au fil de mises à jour régulières.
- Garder la même structure que visuel pstricks

Remarques : Le code donné est minimal et ne sert qu'à montrer les commandes concernées. Les effets sont parfois exagérés pour bien les mettre en évidence. Pour en savoir plus, vous pouvez voir la documentation. Pour se faire j'ai indiqué le numéro de Section de pgfmanual

Vous pouvez me contacter à mon e-mail personnel pour

- me signaler les erreurs que vous avez constatés (merci d'indiquer la page où vous l'avez constaté)
- me faire part de vos commentaires, suggestions ...

Quoi de neuf ! :

- Ajout de la library chains 67
- Ajout de la library through 60
- Ajout de la library turtle 184
- Ajout de la library positioning 56
- Ajout du module tikzsymbols 155
- mise à jour du module tikzducks 149
- mise à jour des modules shape 91

Merci à :
Till Tantau , Alain Matthes , Jim Diamond , Falk Rühl , Axel Kielhorn , Nils Fleischhacker , Michel Fruchart , Ben Vitecek

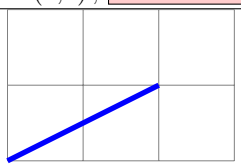
Table des matières

1 Chargement de TikZ

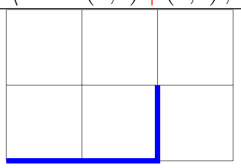
Charger l'extension : \usepackage{tikz}

2 Les figures de base

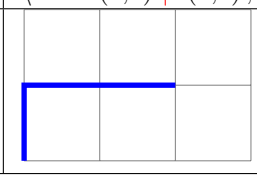
\draw (0,0) - - (2,1) ; PGFmanual section : 14-2



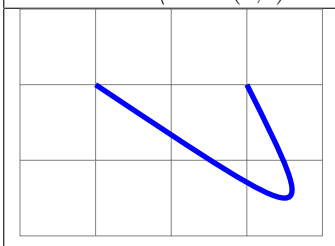
\draw (0,0)-| (2,1) ;



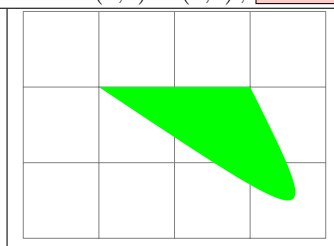
\draw (0,0) |- (2,1) ;



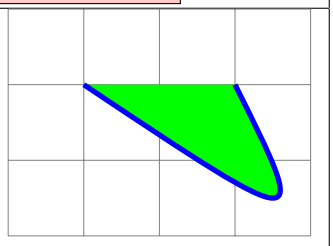
\draw (0,2) . . controls (3,0) .. (2,2) ; PGFmanual section : 14-3



\draw

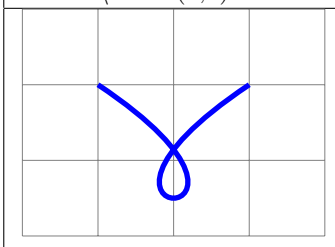


\fill

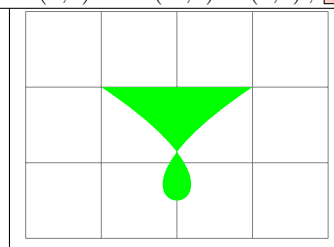


\filldraw

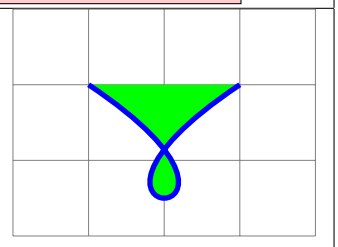
\draw (0,2) . . controls (3,0) and (-1,0) .. (2,2) ; PGFmanual section : 14-3



\draw

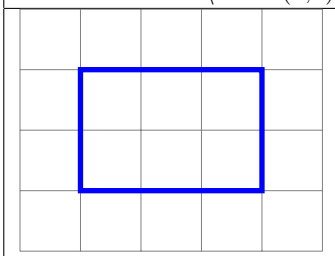


\fill



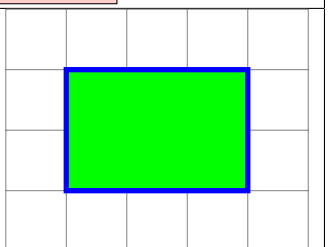
\filldraw

\draw (0,0) rectangle (3,2) ; PGFmanual section : 14-4



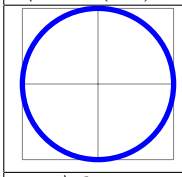
\draw

\fill

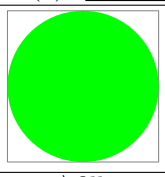


\filldraw

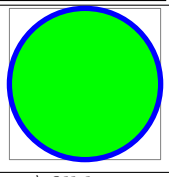
\draw (1,1) circle (1) ; PGFmanual section : 14-6



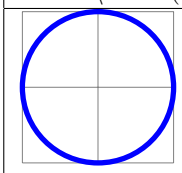
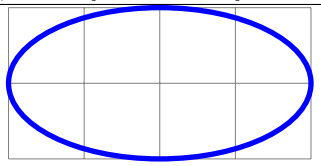
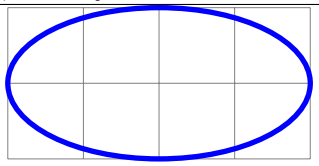
\draw

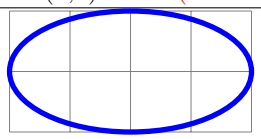
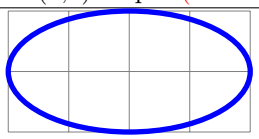


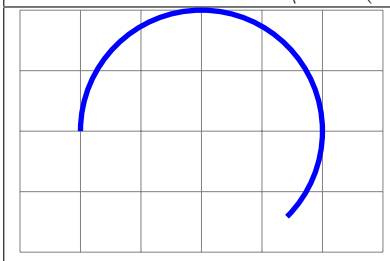
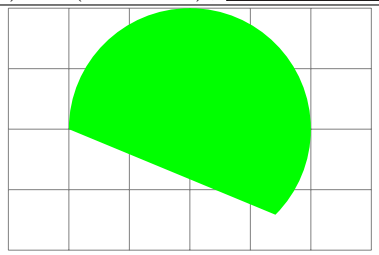
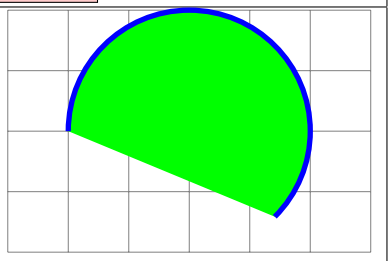
\fill

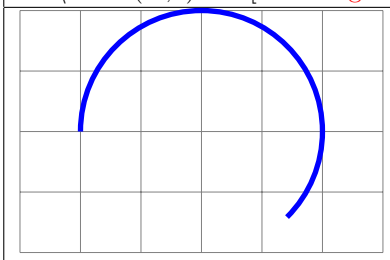
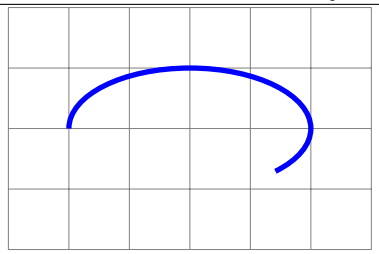
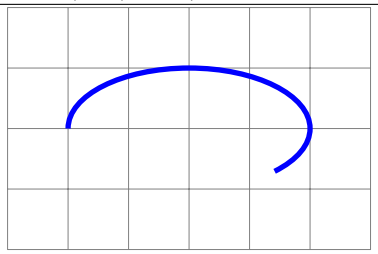


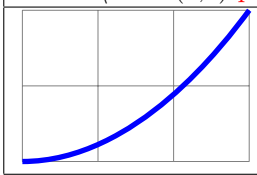
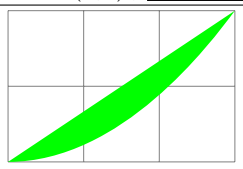
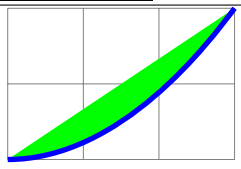
\filldraw

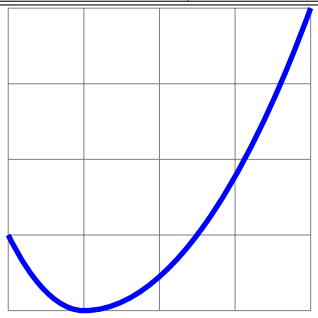
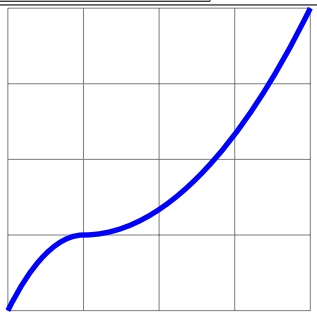
\draw (1,1) circle [radius=1cm] ;		\draw (1,1)ellipse [x radius=2cm,y radius=1cm]
		
radius=1cm	x radius=2cm,y radius=1cm	

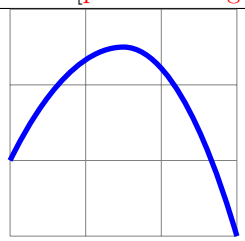
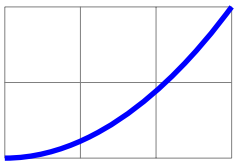
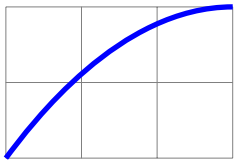
\draw (1,1) circle (2 and 1) ;	\draw (1,1) ellipse (2 and 1) ;
	

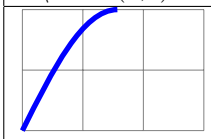
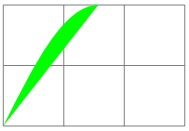
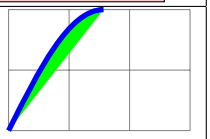
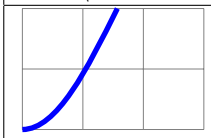
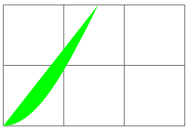
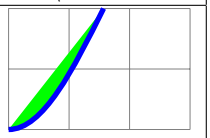
\draw (-2,0) arc (180 :-45:2) ; PGFmanual section : 14-7		
		
\draw	\fill	\filldraw

\draw (-2,0) arc [start angle=180, end angle=-45,radius=1]		\draw (-2,0) arc (180 :-45:2 and 1)
		
radius=1	x radius=1,y radius=.5	

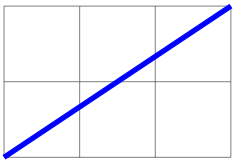
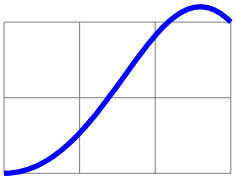
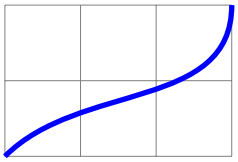
\draw (0,0) parabola (3,2) ; PGFmanual section : 14-9		
		
\draw	\fill	\filldraw

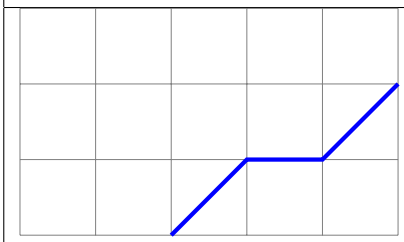
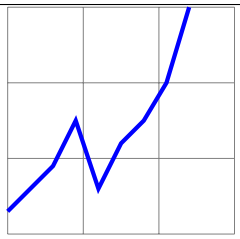
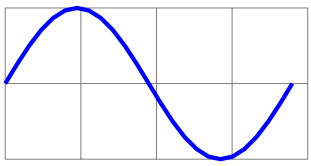
\draw(0,1) parabola bend (1,0) (4,4) ;	\draw(0,0) parabola[bend pos=0.25] (4,4) ;
	

\draw(0,1) parabola [parabola height=2cm] (3,0) ;	\draw(0,0) parabola[bend at start] (3,2) ;	
		
	[bend at start]	[bend at end]

\draw (0,0) sin (1.57,2) ; PGFmanual section : 14-10		
		
\draw	\fill	\filldraw
		
\draw (0,0) cos (1.57,2) ;		

PGFmanual section : 14-13

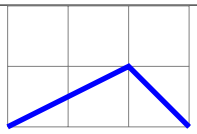
		
\draw (0,0) to (3,2) ;	\draw[out=0] (0,0) to (3,2) ;	\draw [in=-90] (0,0) to (3,2) ;
voir section 7.6 page 51		

Dessin avec plot PGFmanual section : 14-12 PGFmanual section : 22		
une liste de coordonnées	un fichier de coordonnées	une équation mathématique
		
plot coordinates {(2,0) (3,1) (4,1) (5,2)}	plot file {table.dat}	plot (\x,{sin(\x)})
voir page 159		

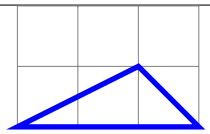
3 Chemin

3.1 Notion de Chemin

PGFmanual section : 14

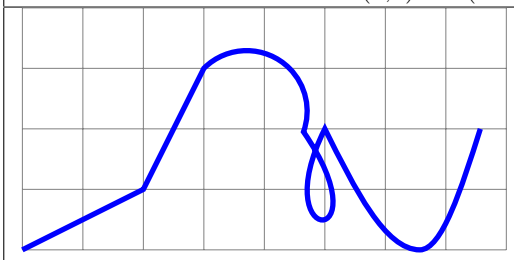


\draw (0,0) - - (2,1) - - (3,0) ;

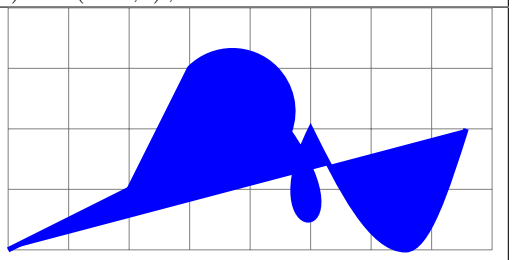


\draw (0,0) - - (2,1) - - (3,0) - - cycle ;

\draw (0,0) - - (2,1) - - (3,3) arc (135 :-20:1) .. controls (6,0) and (4,0)
.. (5,2) sin (6.57,0) cos (7.57,2) ;

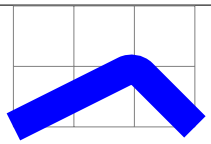


\draw

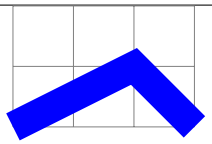


\filldraw

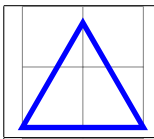
PGFmanual section : 14-5



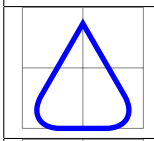
\draw [rounded corners] (0,0) – (2,1) – (3,0) ;



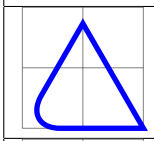
\draw [sharp corners] (0,0) - - (2,1) - - (3,0) ;



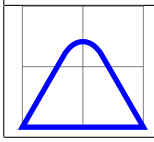
\draw [rounded corners=0.5cm] (0,0) - - (1,1.732) - - (2,0) - - cycle ;



\draw (0,0) - - (1,1.732) [rounded corners=0.5cm] - - (2,0) - - cycle ;

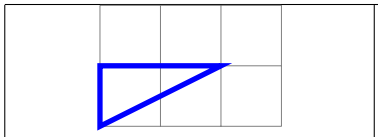


\draw (0,0) - - (1,1.732) - - (2,0)[rounded corners=0.5cm] - - cycle ;

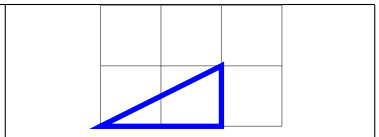


\draw [rounded corners=0.5cm] (0,0) - - (1,1.732)[sharp corners] - - (2,0) - - cycle ;

PGFmanual section : 14-2-2

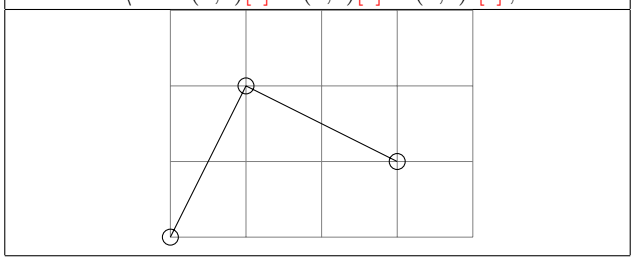


```
\draw (0,0) - - (2,1) -| cycle ;
```



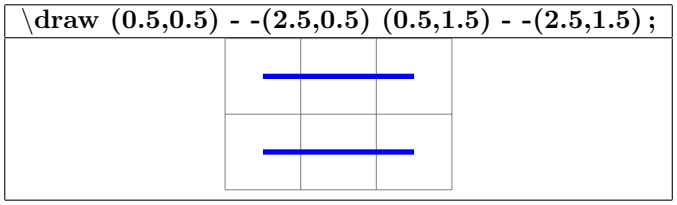
```
\draw (0,0) - - (2,1) |- cycle ;
```

```
\tikz [c/.style={insert path={circle[radius=3pt]}}]
  \draw(0,0)[c] – (1,2)[c] – (3,1) [c] ;
```

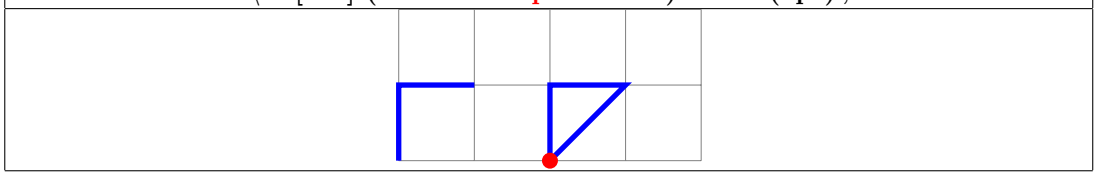


Coupure de chemin PGFmanual section : 14-1

```
\draw (0.5,0.5) - -(2.5,0.5) (0.5,1.5) - -(2.5,1.5) ;
```



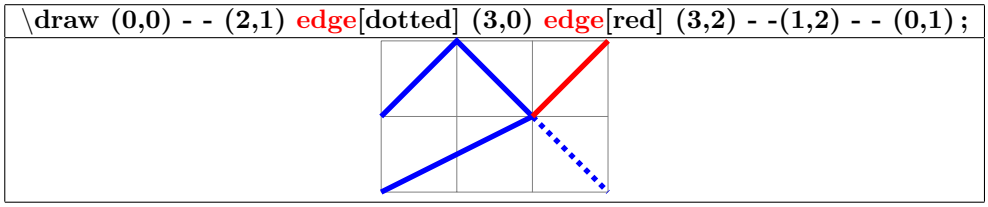
```
\draw (0,0) - - (0,1) - - (1,1) (2,0) - - (2,1) - - (3,1) - - (current subpath start) ;
  \fill[red] (current subpath start) circle (3pt) ;
```



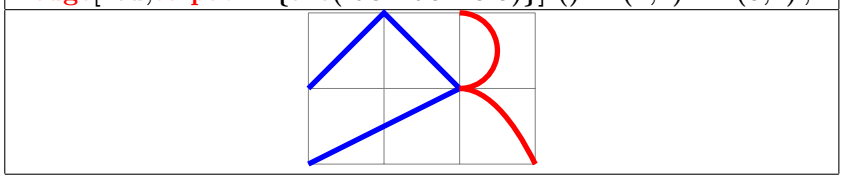
3.2 Chemins dans un chemin

PGFmanual section : 17-12

```
\draw (0,0) - - (2,1) edge[dotted] (3,0) edge[red] (3,2) - -(1,2) - - (0,1) ;
```



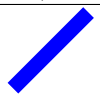
```
\draw (0,0) - - (2,1) edge([red,to path={parabola (3,0)} ] ()
  edge[red,to path={arc(-90 : 90 : 0.5)}] () - -(1,2) - - (0,1) ;
```



4 Les paramètres disponibles

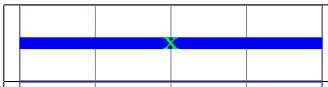
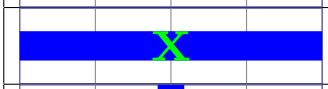
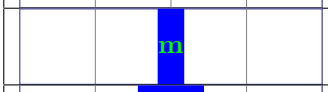
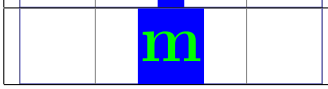
4.1 Épaisseur de ligne

PGFmanual section : 15-3-1

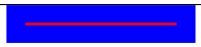
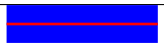
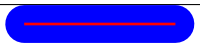
\tikz \draw[line width=.2cm] (0,0) - - (1,1) ;			
			
[line width=.2cm]	[ultra thin] (0.1pt)	[very thin] (0.2pt)	[thin] (0.4pt)
			
[semithick] (0.6pt)	[thick] (0.8pt)	[very thick] (1.2pt)	[ultra thick] (1.6pt)

4.2 Dimensions disponibles

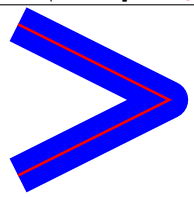
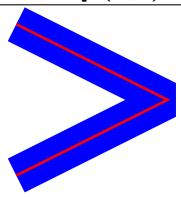
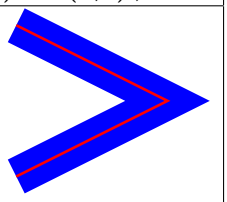
	\draw[line width=10pt] (2,0) to (2,1) ;
	\draw[line width=10bp] (2,0) to (2,1) ;
	\draw[line width=10mm] (2,0) to (2,1) ;
	\draw[line width=1cm] (2,0) to (2,1) ;
	\draw[line width=1in] (2,0) to (2,1) ;

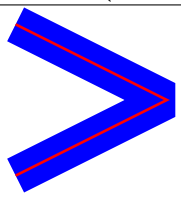
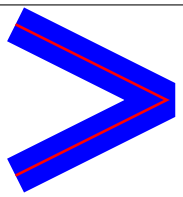
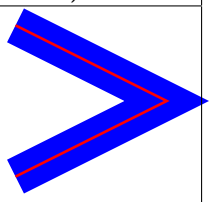
	\draw[line width=1ex] (0,0.5) to (4,.5) ;
	\Huge \draw[line width=1ex] (0,0.5) to (4,.5) ;
	\draw[line width=1em] (2,0) to (2,1) ;
	\Huge \draw[line width=1em] (2,0) to (2,1) ;

4.3 Terminaisons de lignes

		
[line cap=rect]	[line cap=butt]	[line cap=round]

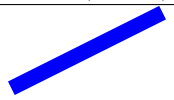
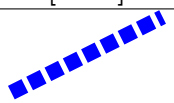
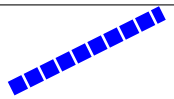
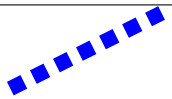
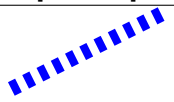
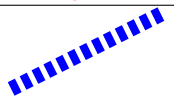
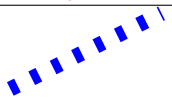
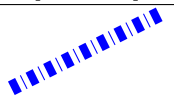
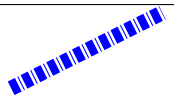
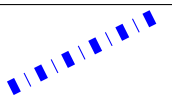
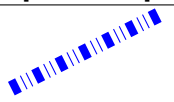
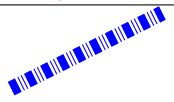
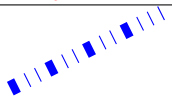
4.4 Jonction de lignes

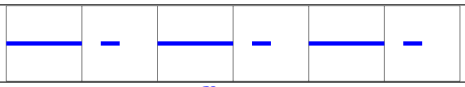
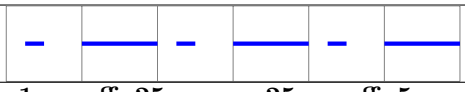
\draw[line join=round] (0,0) - - (2,1) - - (0,2) ;		
		
[line join=round]	[line join=bevel]	[line join=miter]

\draw[miter limit=1] (0,0) - - (2,1) - - (0,2) ; (Par défaut : : miter limit=10)		
		
miter limit=1	miter limit=2	miter limit=3

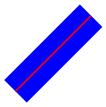
4.5 Styles de ligne

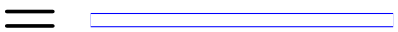
PGFmanual section : 15-3-2

\tikz \draw[solid,line width=2mm] (0,0) - - (2,1) ;		
		
[solid]		
		
[dotted]	[densely dotted]	[loosely dotted]
		
[dashed]	[densely dashed]	[loosely dashed]
		
[dash dot]	[densely dash dot]	[loosely dash dot]
		
[dash dot dot]	[densely dash dot dot]	[loosely dash dot dot]


[dash pattern= on 1cm off 0.25cm on 0.25cm off 0.5cm]

[dash pattern=on 1cm off .25cm on .25cm off .5cm,dash phase=1cm]

PGFmanual section : 15-3-4

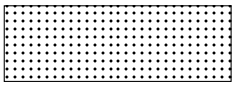
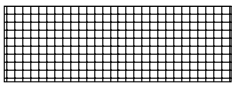
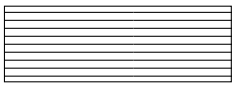
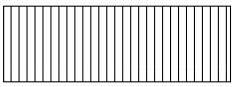
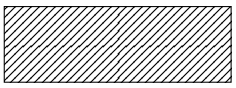
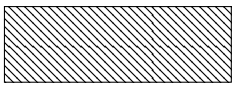
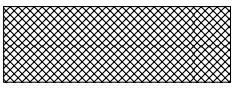
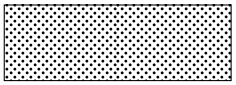
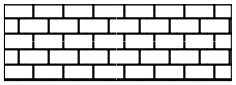
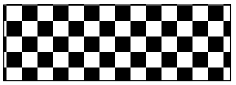
\tikz \draw[line width=.2cm,double] (0,0) - - (1,1) ;			
			
double	draw=blue,double=red	double distance=.3cm	double distance between line centers =.3cm

\Huge = \tikz \draw[double equal sign distance] (0,0) - - (4,0) ;	
	
\Huge	\large

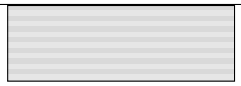
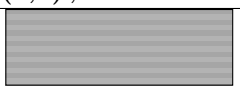
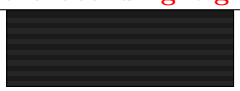
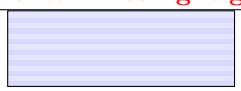
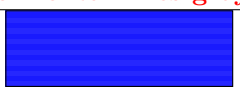
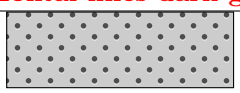
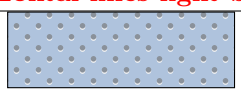
4.6 Remplissage en motifs

PGFmanual section : 15-5-1 PGFmanual section : 60

Charger l'extension : \usetikzlibrary{patterns}

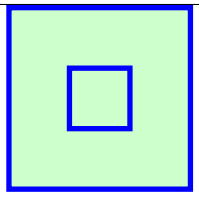
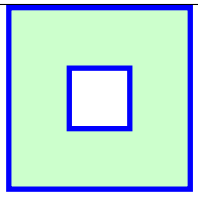
\draw[pattern= dots] (0,0) - - (3,1) ;		
		
dots	fivepointed stars	sixpointed stars
		
grid	horizontal lines	vertical lines
		
north east lines	north west lines	rosshatch
		
crosshatch dots	bricks	checkerboard

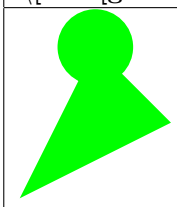
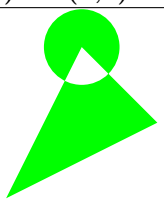
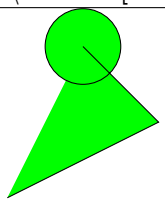
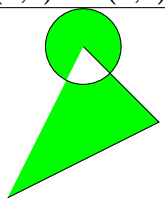

\draw[pattern=fivepointed stars,pattern color=red] (0,0) rectangle (3,1) ;

\draw[pattern=checkerboard light gray] (0,0) - - ((3,2) ;		
		
checkerboard light gray	horizontal lines light gray	horizontal lines gray
		
horizontal lines dark gray	horizontal lines light blue	horizontal lines dark blue
		
crosshatch dots gray	crosshatch dots light steel blue	

4.7 Règle de remplissage

PGFmanual section : 15-5-2

nonzero rule (Par défaut :)	
	
\filldraw [fill=green !20] (0,0) - - (0,3) - - (3,3) - - (3,0) - - cycle (1,1) - - (1,2) - - (2,2) - -(2,1) - - cycle ;	\filldraw [fill=green !20] (0,0) - - (0,3) - - (3,3) - - (3,0) - - cycle (1,1) - - (2,1) - - (2,2) - -(1,2) - - cycle ;

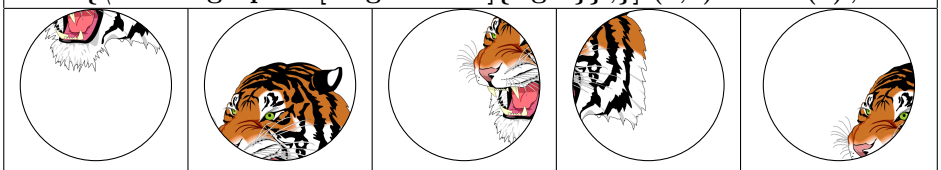
even odd rule			
\[fill=[green] (0,0) - - (2,1) - - (1,2) circle (.5cm) ;		\filldraw[fill=green] (0,0) – (2,1) - - (1,2) circle (.5cm) ;	
			
[fill=green]	[even odd rule,fill=green]	[fill=green]	[even odd rule,fill=green]

4.8 Remplissage à l'aide d'une image

PGFmanual section : 15-6

\draw [path picture={ \node at (path picture bounding box.center) {\includegraphics[height=3cm]{tiger}} ;}] (0,1) circle (1) ;		
		
(0,1) circle (1)	(0,0) - - (-1,1) - - (0,2) - - (1,1) - - cycle	(1,0) parabola[parabola height=2cm] (3,0)

\draw [path picture={ \node at (path picture bounding box.north) {\includegraphics[height=3cm]{tiger}};}] (0,1) circle (1);



north	south	east	west	south east

4.9 Ombrage

4.9.1 Ombrages disponibles

PGFmanual section : 15-7

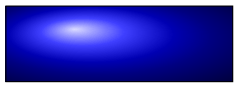
\shade (0,0) rectangle (3,1);

\shadedraw (0,0) rectangle (3,1);

\shadedraw[shading=axis](0,0) rectangle (3,1);

axis

radial



ball

[left color=red]

[right color=green]

left color=red,right color=green

[top color=red]

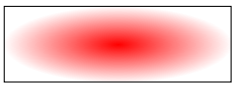
[bottom color=green]

middle color=red

shading angle=90

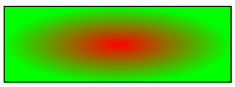
right color=green
[shading angle=45]

left color=red
shading angle=-45



inner color=red

outer color=green



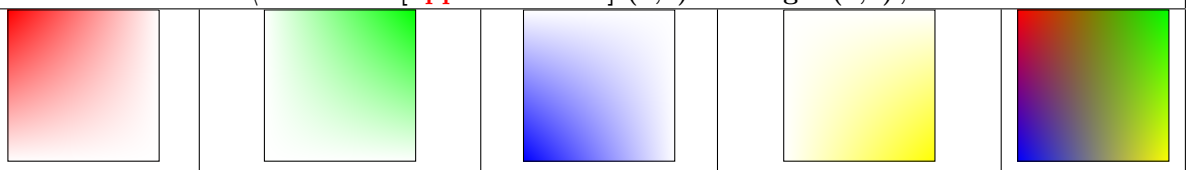
inner color=red outer color=green

4.9.2 Bibliothèque shadings

PGFmanual section : 65

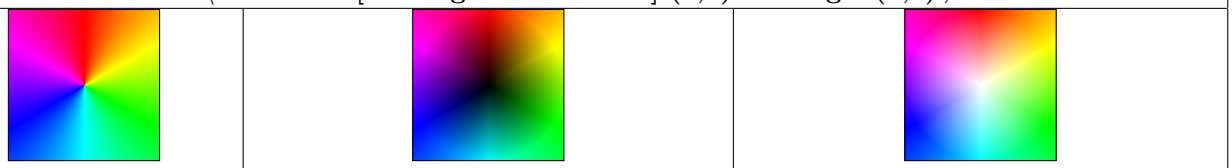
Charger l'extension : \usetikzlibrary{shadings}

\shadedraw[upper left=red] (0,0) rectangle (2,2) ;

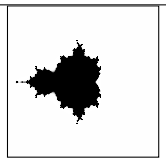


upper left=red | upper right=green | lower left=blue | lower right=yellow

\shadedraw[shading=color wheel] (0,0) rectangle (2,2) ;



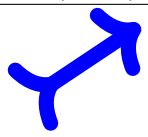
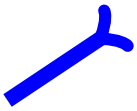
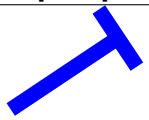
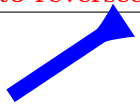
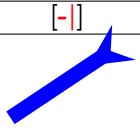
shading=color wheel | shading=color wheel black center | shading=color wheel white center



shading=Mandelbrot set

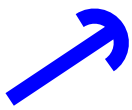
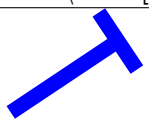
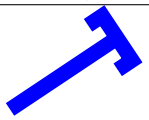
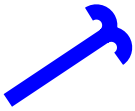
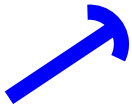
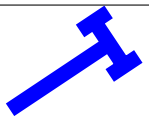
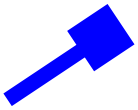
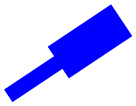
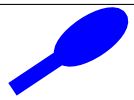
4.10 Les extrémités

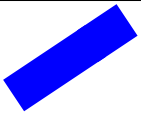
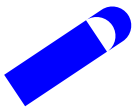
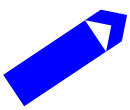
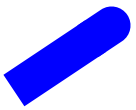
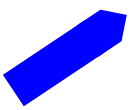
4.10.1 Chargé automatiquement avec TikZ

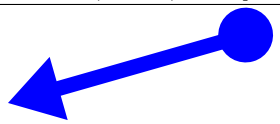
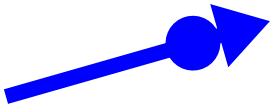
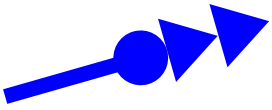
\tikz \draw[->,line width=.2cm,blue] (0,0) - - (1.5,1) ;			
			
[->]	[<-]	[<->]	[>->]
			
[-to]	[-to reversed]	[-o]	[-|]
			
[-latex]	[-latex reversed]	[-stealth]	[-stealth reversed]

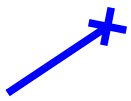
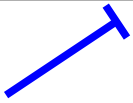
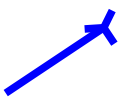
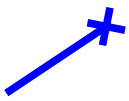
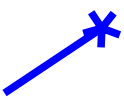
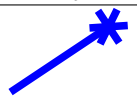
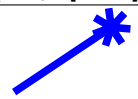
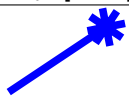
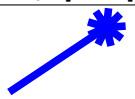
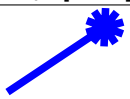
4.10.2 « library arrow.meta »

Charger l'extension : \usetikzlibrary{arrows.meta}

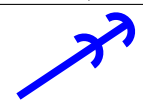
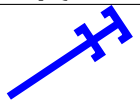
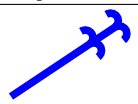
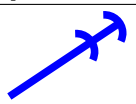
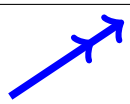
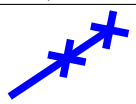
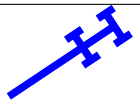
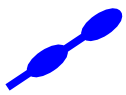
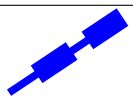
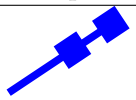
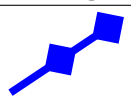
\tikz \draw[-Arc Barb,line width=.2cm,blue] (0,0) - - (1.5,1) ;				
				
-Arc Barb	-Bar	-Bracket	-Hooks	-Stealth
				
-Parenthesis	-Straight Barb	-Tee Barb	-Classical TikZ Rightarrow	-Square
				
-Circle	-Implies, double	-Rectangle	-Computer Modern Rightarrow	-Turned Square
			[-To]	
				
-Diamond	-Ellipse	-Kite	[-Latex]	-Triangle

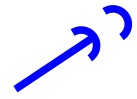
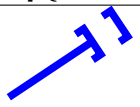
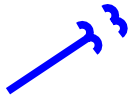
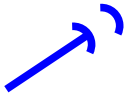
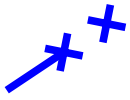
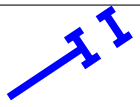
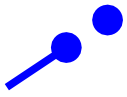
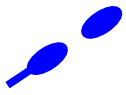
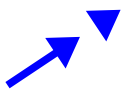
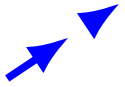
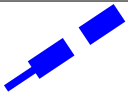
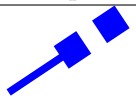
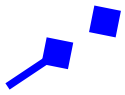
\tikz \draw[-Butt Cap,line width=.2cm,blue] (0,0) - - (1.5,1) ;				
				
-Butt Cap	-Fast Round	-Fast Triangle	-Round Cap	-Triangle Cap

\tikz \draw[Triangle-Circle,line width=.2cm,blue] (0,0) - - (3.5,1) ;		
		
Triangle-Circle	{Circle[] Triangle[]}	{Circle[] . Triangle[] Triangle[] }

\tikz \draw[-Rays],line width=.1cm,blue] (0,0) - - (1.5,1) ;				
				
Rays	{Rays[n=2]}	{Rays[n=3]}	{Rays[n=4]}	{Rays[n=5]}
				
{Rays[n=6]}	{Rays[n=7]}	{Rays[n=8]}	{Rays[n=9]}	{Rays[n=10]}

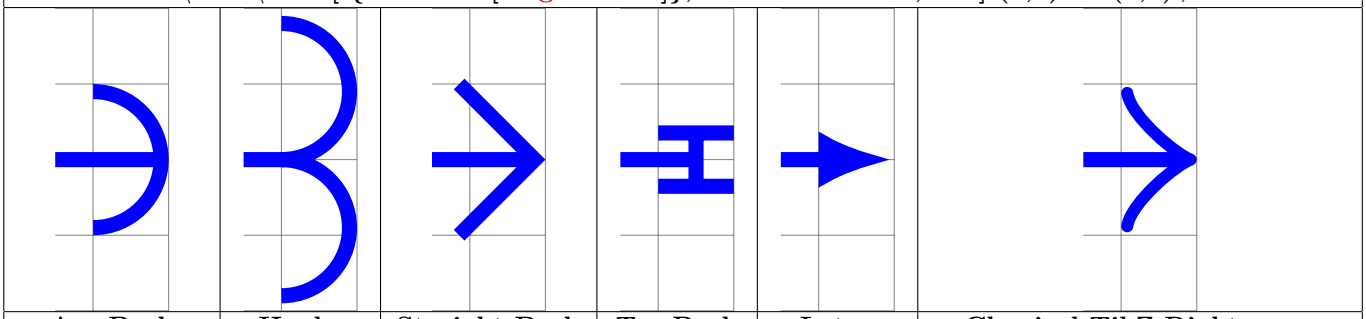
Paramètre sep **PGFmanual section : 16-4-2**

\tikz \draw[-{Arc Barb[sep=.25cm] Arc Barb[ ]},line width=.1cm,blue] (0,0) - - (1.5,1) ;					
					
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Rays
					
Straight Barb	Tee Barb	Circle	Ellipse	Computer Modern Rightarrow	Triangle
					
Latex	Kite	Rectangle	Square	Stealth	Turned Square

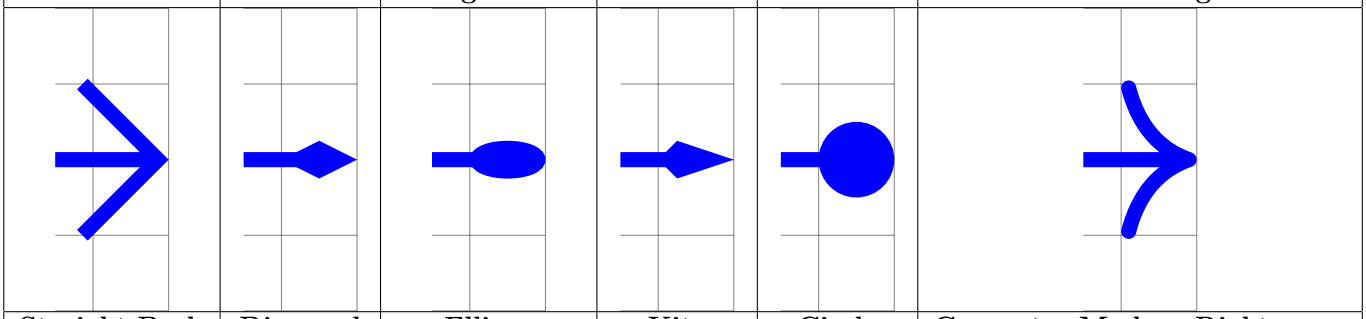
\tikz \draw[-{Arc Barb[sep=.25cm] • Arc Barb[ ]},line width=.1cm,blue] (0,0) - - (1.5,1) ;					
					
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Rays
					
Straight Barb	Tee Barb	Circle	Ellipse	Computer Modern Rightarrow	Triangle
					
Latex	Kite	Rectangle	Square	Stealth	Turned Square

Paramètre length PGFmanual section : 16-3-1

\tikz \draw[-{Arc Barb[length=1cm]},line width=.2cm,blue] (0,0) - - (1,1) ;

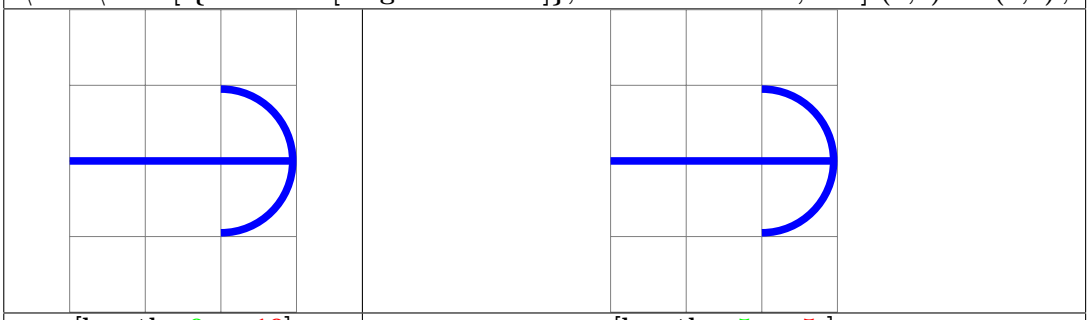


Arc Barb	Hooks	Straight Barb	Tee Barb	Latex	Classical TikZ Rightarrow



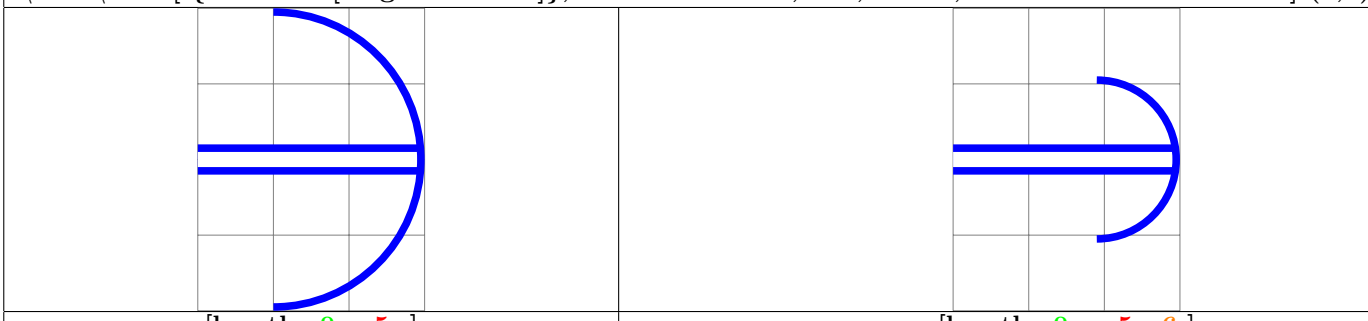
Straight Barb	Diamond	Ellipse	Kite	Circle	Computer Modern Rightarrow

\tikz \draw[-{Arc Barb[length=0cm 10]},line width=.1cm,blue] (0,0) - - (3,1) ;



[length=0cm 10]	[length=.5cm 5]
0cm + 10 x .1cm = 1cm	.5cm + 5 x .1cm = 1cm

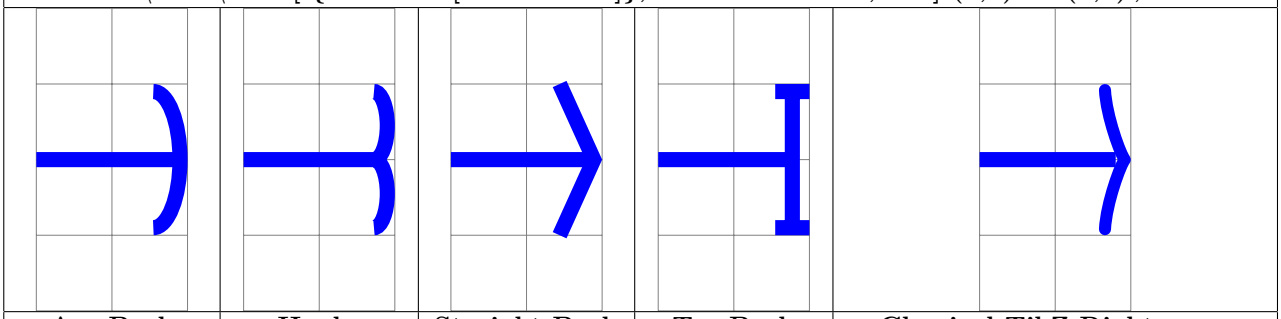
\tikz \draw[-{Arc Barb[length=0cm 5]},line width=.1cm,blue,double,double distance = 2 mm] (0,0) - - (3,1



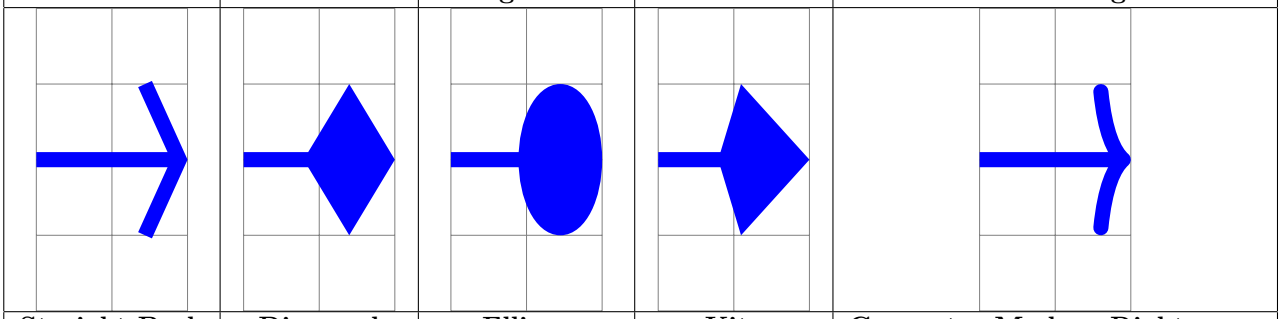
[length=0cm5]	[length=0cm 5 .6]
0cm + 5 x (.1cm + 2 mm + .1cm) = 2cm	0cm + 5 x (.6 x .1cm+ (1-.6)(.1cm+ 2 mm+.1cm) = 11 mm

Paramètre width PGFmanual section : 16-3-1

\tikz \draw[-{Arc Barb[width=2cm]},line width=.2cm,blue] (0,0) - - (1,1) ;

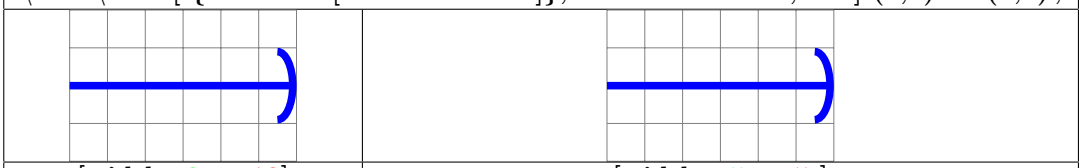


Arc Barb	Hooks	Straight Barb	Tee Barb	Classical TikZ Rightarrow



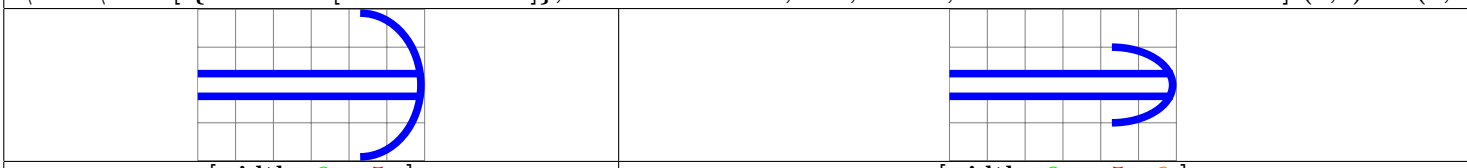
Straight Barb	Diamond	Ellipse	Kite	Computer Modern Rightarrow

\tikz \draw[-{Arc Barb[width=0cm 10]},line width=.1cm,blue] (0,0) - - (3,1) ;



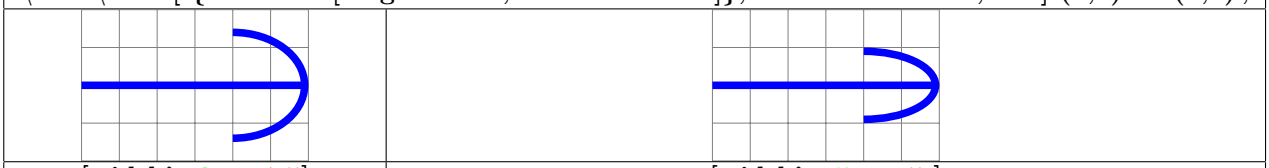
[width=0cm 10]	[width=.5cm 5]
0cm + 10 x .1cm = 1cm	.5cm + 5 x .1cm = 1cm

\tikz \draw[-{Arc Barb[width=0cm 5]},line width=.1cm,blue,double,double distance = 2 mm] (0,0) - - (3,1

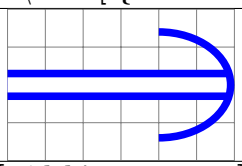
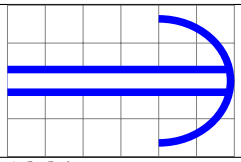


[width=0cm5]	[width=0cm 5 .6]
0cm + 5 x (.1cm + 2 mm + .1cm) = 2cm	0cm + 5 x (.6 x .1cm+ (1-.6)(.1cm+ 2 mm+=.1cm) = 11 mm

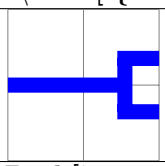
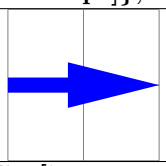
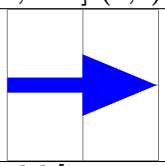
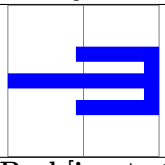
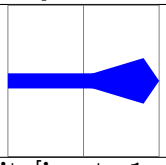
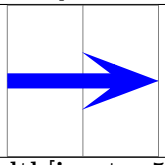
\tikz \draw[-{Arc Barb[length=1cm,width=0cm 1.5]},line width'=.1cm,blue] (0,0) - - (3,1) ;

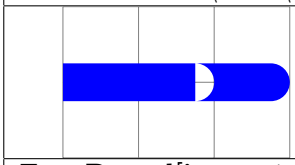
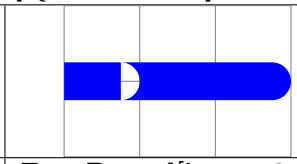
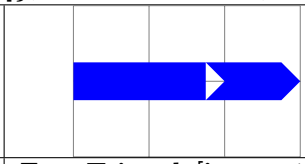
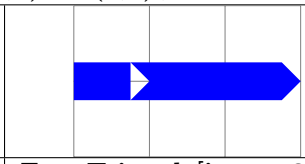


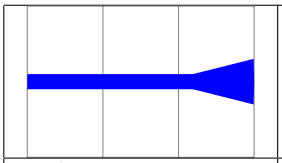
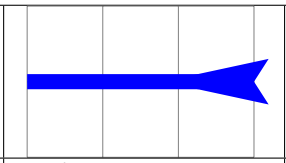
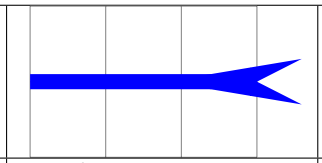
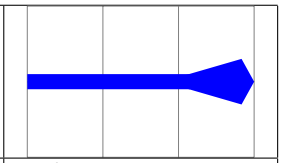
[width'=0cm 1.5]	[width'=.5cm .5]
0cm + 1.5 x 1cm = 1.5cm	.5cm + .5 x 1cm = 1cm

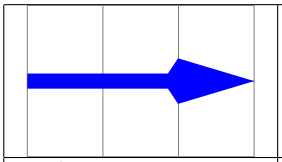
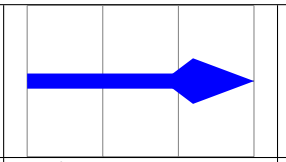
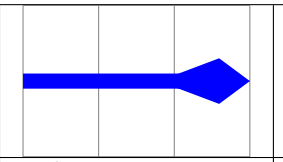
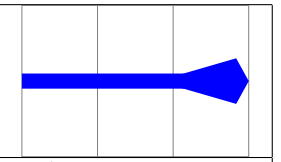
\tikz \draw[-{Arc Barb[length=1cm,width'=0cm 1.5]},line width=.1cm,blue,double,double distance = 2 mm	
	
[width'=0cm 1.5]	[width'=0cm 1.5 .6]
0cm + 1.5 x 1cm = 1.5cm	0cm + 1.5 x (.6 x 1cm+ (1-.6)(1cm+ 2 mm+1cm) = 11 mm

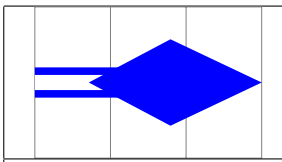
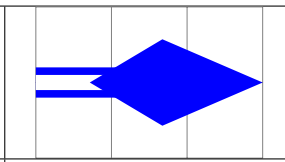
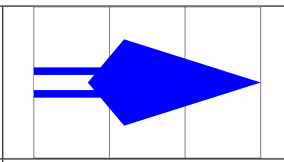
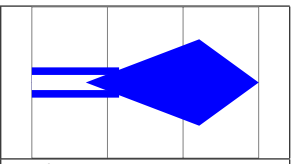
Paramètre inset PGFmanual section : 16-3-1

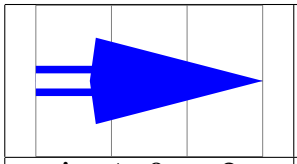
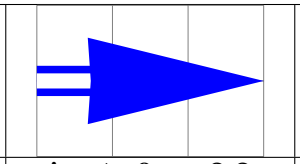
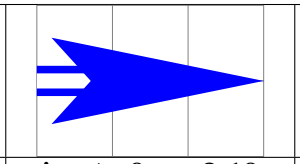
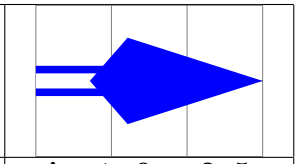
\tikz \draw[-{Tee Barb[inset=0pt]},line width=.2cm,blue] (0,0) - - (1,1) ;		
		
Tee Barb[inset=0pt]	Kite[inset=0pt]	Stealth[inset=0pt]
		
Tee Barb[inset=1cm]	Kite[inset=1cm]	Stealth[inset=.5cm]

\tikz \draw[-{Fast Round[inset=1cm]},line width=.2cm,blue] (0,0) - - (1,1) ;			
			
Fast Round[inset=1cm]	Fast Round[inset=2cm]	Fast Triangle[inset=1cm]	Fast Triangle[inset=2cm]

			
inset=1cm 1	inset=1cm 2	inset=1cm 4	inset=1cm .2

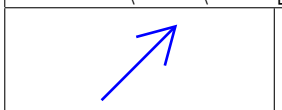
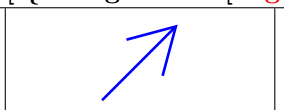
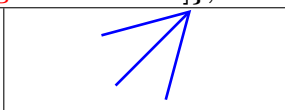
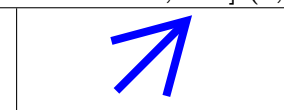
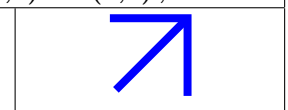
			
inset=0cm 1	inset=0cm 2	inset=0cm 4	inset=0cm .2

			
inset=0cm .2	inset=0cm .2 2	inset=0cm .2 10	inset=0cm 2 .5

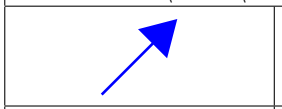
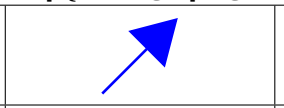
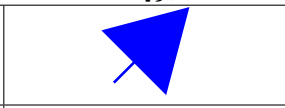
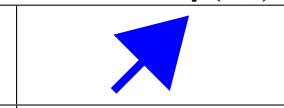
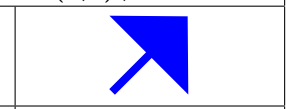
			
inset=0cm .2	inset=0cm .2 2	inset=0cm .2 10	inset=0cm 2 .5

Paramètre angle PGFmanual section : 16-3-1

\tikz \draw[-{Straight Barb[angle=60:.5cm 1]},line width=.2cm,blue] (0,0) - - (1,1) ;

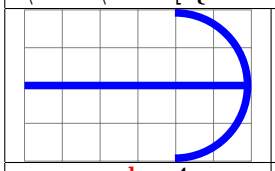
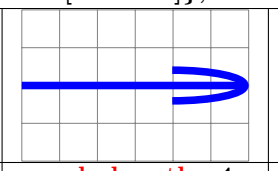
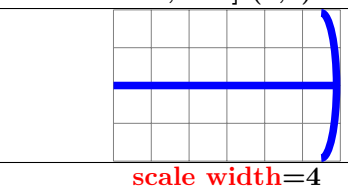
				
[angle=60:.5cm 1]	[angle=60:.5cm 1]	[angle=60:.5cm 20]	[angle=60:.5cm 5]	[angle=90:.5cm 5]

\tikz \draw[-{Triangle[angle=60:.5cm 1]},line width=.2cm,blue] (0,0) - - (1,1) ;

				
[angle=60:.5cm 1]	[angle=60:.5cm 1]	[angle=60:.5cm 20]	[angle=60:.5cm 5]	[angle=90:.5cm 5]

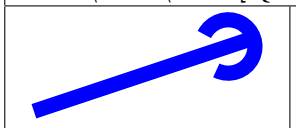
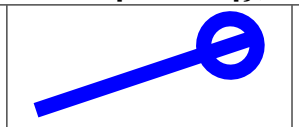
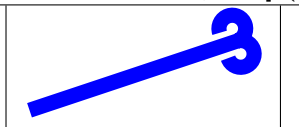
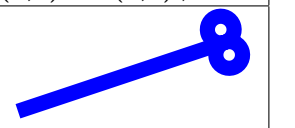
Paramètre scale PGFmanual section : 16-3-2

\tikz \draw[-{Arc Barb[scale=4]},li ne width=.1cm,blue] (0,0) - - (3,0) ;

		
scale=4	scale length=4	scale width=4

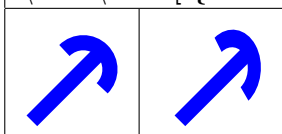
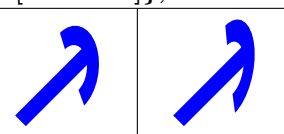
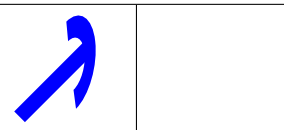
Paramètre arc PGFmanual section : 16-3-3

\tikz \draw[-{Arc Barb[arc=270]},line width=.2cm,blue] (0,0) - - (3,1) ;

			
Arc Barb[arc=270]	Arc Barb[arc=360]	Hooks[arc=270]	Hooks[arc=360]

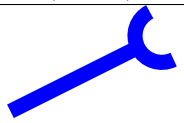
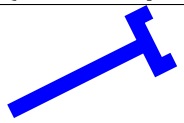
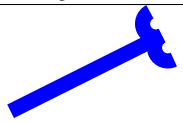
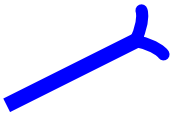
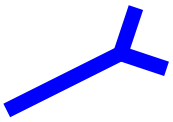
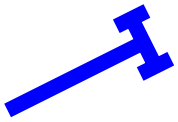
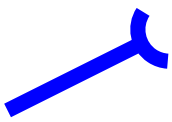
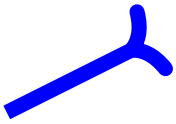
Paramètre slant PGFmanual section : 16-3-4

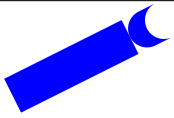
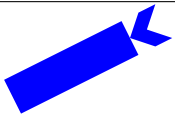
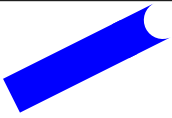
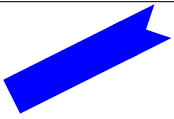
\tikz \draw[-{Arc Barb[slant=.3]},line width=.2cm,blue] (0,0) - - (1,1) ;

				
slant=0	slant=0.3	slant=0.5	slant=0.8	slant=1

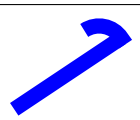
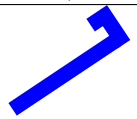
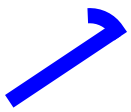
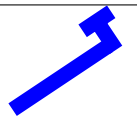
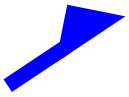
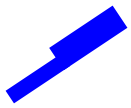
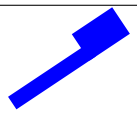
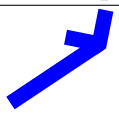
\tikz \draw[-{Arc Barb[slant=.5]},line width=.2cm,blue] (0,0) - - (1,1) ;				
				
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow
				
Straight Barb	Tee Barb	Circle	Diamond	Ellipse
				
Kite	Latex	Rectangle	Square	Stealth
				
Turned Square	Fast Round	Fast Triangle	Round Cap	Triangle Cap

Paramètre reversed PGFmanual section : 16-3-5

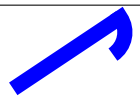
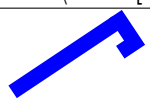
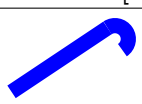
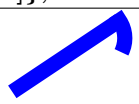
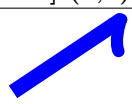
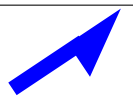
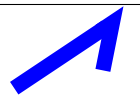
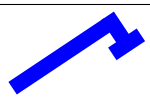
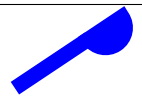
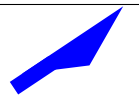
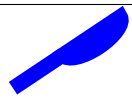
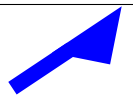
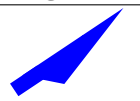
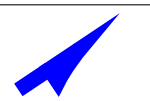
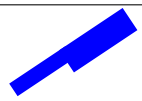
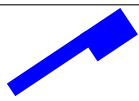
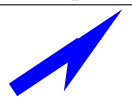
\tikz \draw[-{Arc Barb[reversed},line width=.2cm,blue] (0,0) - - (2,1) ;			
			
Arc Barb	Bracket	Hooks	Classical TikZ Rightarrow
			
Straight Barb	Tee Barb	Parenthesis	Computer Modern Rightarrow

\tikz \draw[-{Fast Round[reversed]},line width=.5cm,blue] (0,0) - - (2,1) ;			
			
Fast Round	Fast Triangle	Round Cap	Triangle Cap

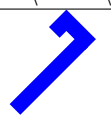
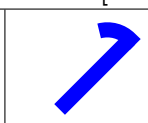
Paramètre left PGFmanual section : 16-3-5

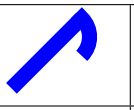
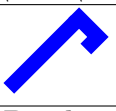
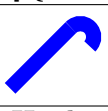
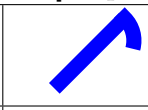
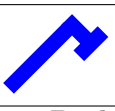
\tikz \draw[-{Arc Barb[left]},line width=.2cm,blue] (0,0) - - (1.5,1) ;					
					
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Triangle
					
Straight Barb	Tee Barb	Circle	Diamond	Ellipse	Turned Square
					
Kite	Latex	Rectangle	Square	Stealth	Rays

Paramètre right PGFmanual section : 16-3-5

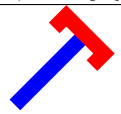
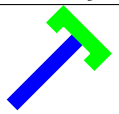
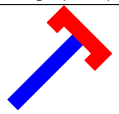
\tikz \draw[-{Arc Barb[right]},line width=.2cm,blue] (0,0) - - (1.5,1) ;					
					
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Triangle
					
Straight Barb	Tee Barb	Circle	Diamond	Ellipse	Turned Square
					
Kite	Latex	Rectangle	Square	Stealth	Rays

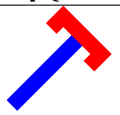
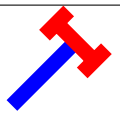
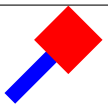
Paramètre harpoon PGFmanual section : 16-3-5

\tikz \draw[-{Arc Barb[harpoon]},line width=.2cm,blue] (0,0) - - (1,1) ;						
						
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Straight Barb	Tee Barb

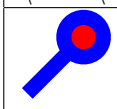
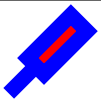
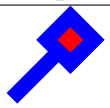
\tikz \draw[-{Arc Barb[harpoon,swap]},line width=.2cm,blue] (0,0) - - (1,1) ;						
						
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow	Straight Barb	Tee Barb

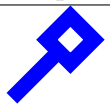
Paramètre color PGFmanual section : 16-3-6

\tikz \draw[-{Arc Barb[color=red},line width=.2cm,blue] (0,0) - - (1,1) ;		
		
Bracket[color=red]	Bracket[color=green]	Bracket[red]

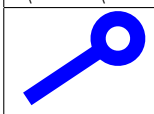
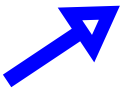
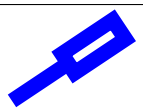
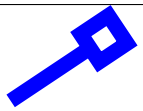
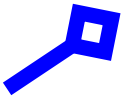
\tikz \draw[-{Arc Barb[red},line width=.2cm,blue] (0,0) - - (1,1) ;				
				
Arc Barb	Bracket	Hooks	Parenthesis	Classical TikZ Rightarrow
				
Straight Barb	Tee Barb	Circle	Diamond	Ellipse
				
Kite	Latex	Rectangle	Square	Stealth
				
Triangle	Turned Square	Rays		

Paramètre fill PGFmanual section : 16-3-6

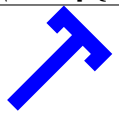
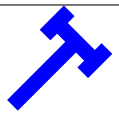
\tikz \draw[-{Circle[fill=red]},line width=.2cm,blue] (0,0) - - (1,1) ;				
				
Circle	Diamond	Ellipse	Kite	Triangle
				
Latex	Rectangle	Square	Stealth	Turned Square

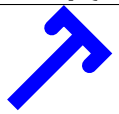
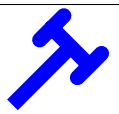
\tikz \draw[-{Circle[fill=none]},line width=.2cm,blue] (0,0) - - (1,1) ;				
				
Circle	Diamond	Ellipse	Kite	Triangle
				
Latex	Rectangle	Square	Stealth	Turned Square

Paramètre open PGFmanual section : 16-3-6

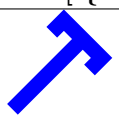
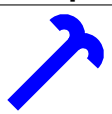
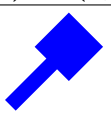
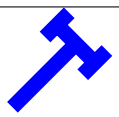
\tikz \draw[-{Circle[open]},line width=.2cm,blue] (0,0) - - (1.5,1) ;				
				
Circle	Diamond	Ellipse	Kite	Triangle
				
Latex	Rectangle	Square	Stealth	Turned Square

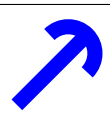
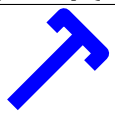
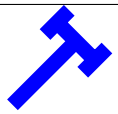
Paramètre line cap : round or butt PGFmanual section : 16-3-7

\tikz \draw[-{Arc Barb[line cap=butt]},line width=.2cm,blue] (0,0) - - (1,1) ;							
							
Arc Barb	Bracket	Hooks	Parenthesis	Ellipse	Rectangle	Square	Stealth
							
Straight Barb	Tee Barb	Diamond	Kite	Latex	Triangle	Turned Square	Rays

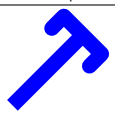
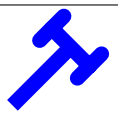
\tikz \draw[-{Arc Barb[line cap=round]},line width=.2cm,blue] (0,0) - - (1,1) ;							
							
Arc Barb	Bracket	Hooks	Parenthesis	Ellipse	Rectangle	Square	Stealth
							
Straight Barb	Tee Barb	Diamond	Kite	Latex	Triangle	Turned Square	Rays

Paramètre line join : round or miter PGFmanual section : 16-3-7

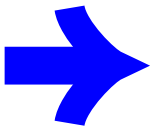
\tikz \draw[-{Arc Barb[line join=miter]},line width=.2cm,blue] (0,0) - - (1,1) ;							
							
Arc Barb	Bracket	Hooks	Parenthesis	Ellipse	Rectangle	Square	Stealth
							
Straight Barb	Tee Barb	Diamond	Kite	Latex	Triangle	Turned Square	Rays

\tikz \draw[-{Arc Barb[line cap=round]},line width=.2cm,blue] (0,0) - - (1,1) ;							
							
Arc Barb	Bracket	Hooks	Parenthesis	Ellipse	Rectangle	Square	Stealth
							
Straight Barb	Tee Barb	Diamond	Kite	Latex	Triangle	Turned Square	Rays

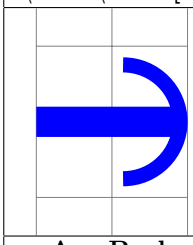
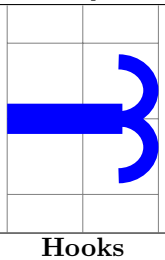
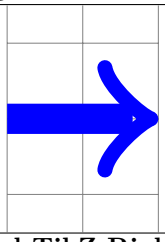
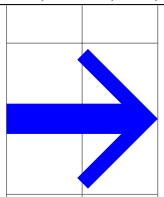
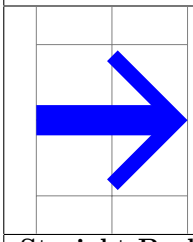
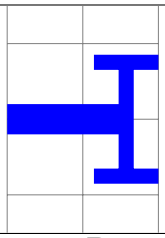
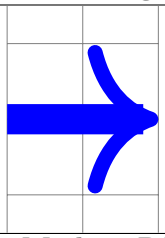
Paramètre round PGFmanual section : 16-3-7

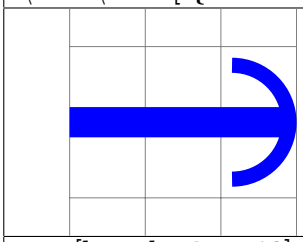
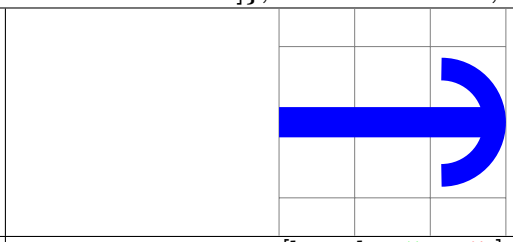
\tikz \draw[-{Arc Barb[round]},line width=.2cm,blue] (0,0) - - (1,1) ;							
							
Arc Barb	Bracket	Hooks	Parenthesis	Ellipse	Rectangle	Square	Stealth
							
Straight Barb	Tee Barb	Diamond	Kite	Latex	Triangle	Turned Square	Rays

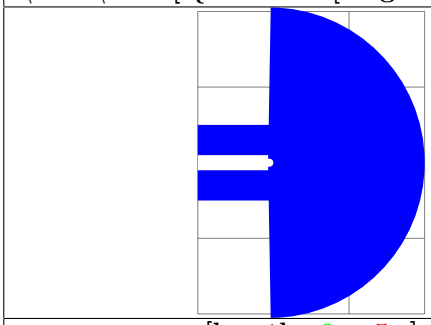
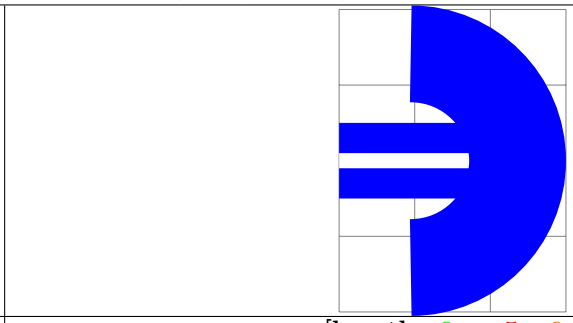
Paramètre sharp PGFmanual section : 16-3-7

\tikz \draw[-{Classical TikZ Rightarrow[sharp]},line width=.2cm,blue] (0,0) - - (2,0)) ;			
-{Classical TikZ Rightarrow[sharp]}		-{Computer Modern Rightarrow[sharp]}	
			
sharp	[ ]	sharp	[ ]

Paramètre line width PGFmanual section : 16-3-7

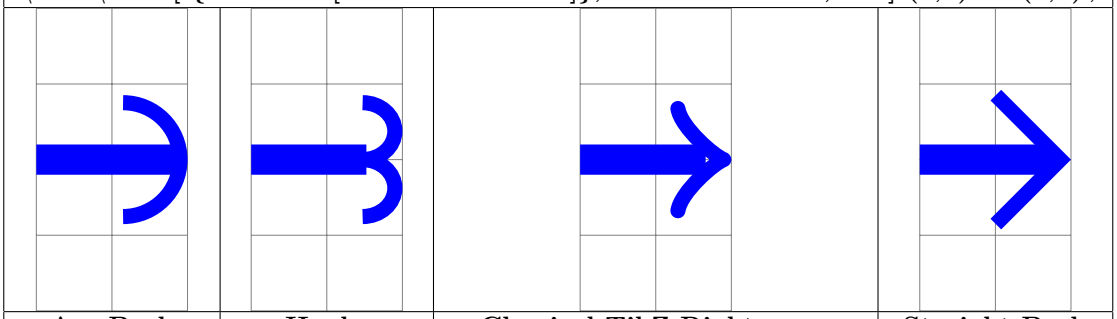
\tikz \draw[-{Arc Barb[line width=.2cm]},line width=.4cm,blue] (0,0) - - (2,0) ;			
			
Arc Barb	Hooks	Classical TikZ Rightarrow	Straight Barb
			
Straight Barb	Tee Bar	Computer Modern Rightarrow	

\tikz \draw[-{Arc Barb[line width=0cm 10]},line width=.1cm,blue] (0,0) - - (3,1) ;	
	
[length=0cm 10]	[length=.5cm 5]
0cm + 10 x .1cm = 1cm	.5cm + 5 x .1cm = 1cm

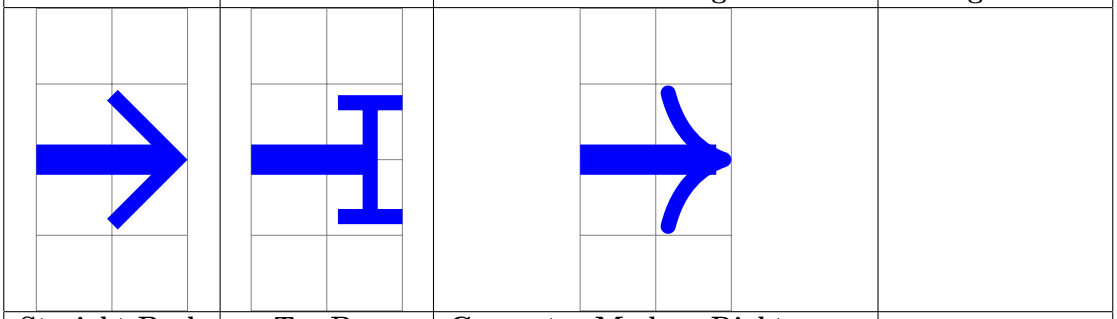
\tikz \draw[-{Arc Barb[length=0cm 5]},line width=.1cm,blue,double,double distance = 2 mm] (0,0) - - (3,1	
	
[length=0cm5]	[length=0cm 5 .6]
0cm + 5 x (.1cm + 2 mm + .1cm) = 2cm	0cm + 5 x (.6 x .1cm+ (1-.6)(.1cm+ 2 mm+.1cm) = 11 mm

Paramètre line width' PGFmanual section : 16-3-7

```
\tikz \draw[-{Arc Barb[line width'=.2cm]},line width=.4cm,blue] (0,0) - - (1,1) ;
```

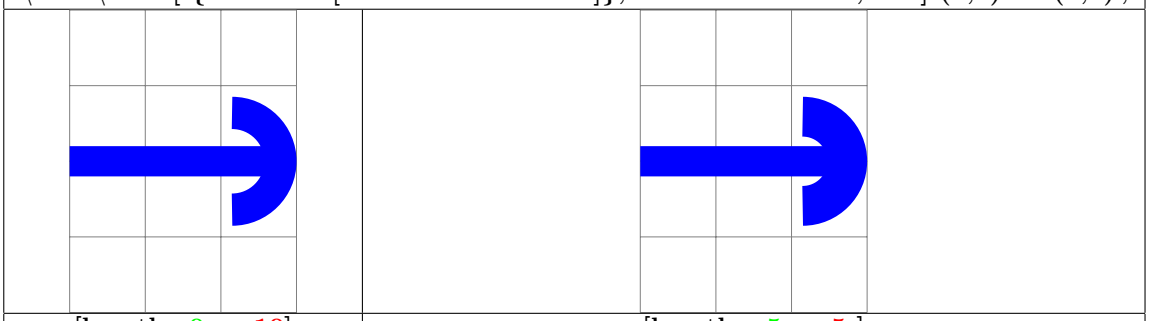


Arc Barb	Hooks	Classical TikZ Rightarrow	Straight Barb



Straight Barb	Tee Bar	Computer Modern Rightarrow	

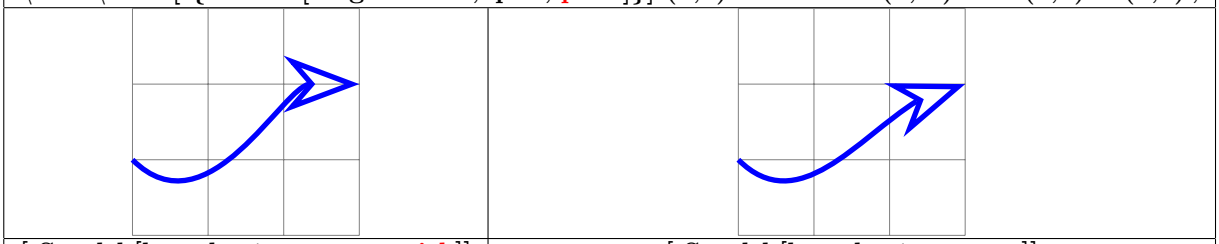
```
\tikz \draw[-{Arc Barb[line width=0cm 10]},line width'=.1cm,blue] (0,0) - - (3,1) ;
```



[length=0cm 10]	[length=.5cm 5]
0cm + 10 x .1cm = 1cm	.5cm + 5 x .1cm = 1cm

Paramètre quick PGFmanual section : 16-3-8

```
\tikz \draw[-{Stealth[length=1cm,open,quick]}] (0,0) .. controls (1,-1) and (2,1) .. (3,1) ;
```

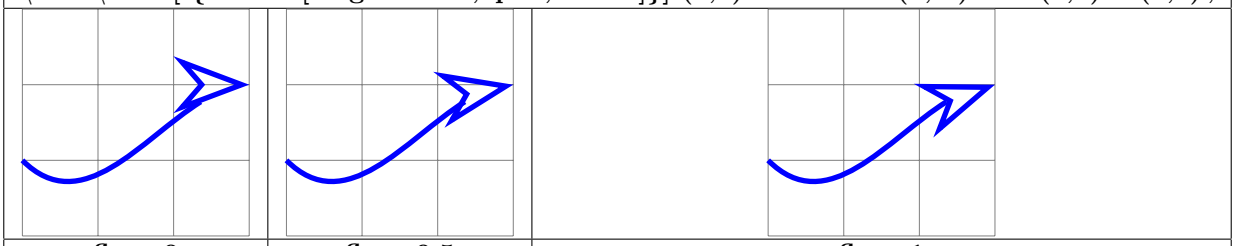


[-Stealth[length=1cm,open,quick]]	[-Stealth[length=1cm,open]]

Paramètre bending PGFmanual section : 16-3-8

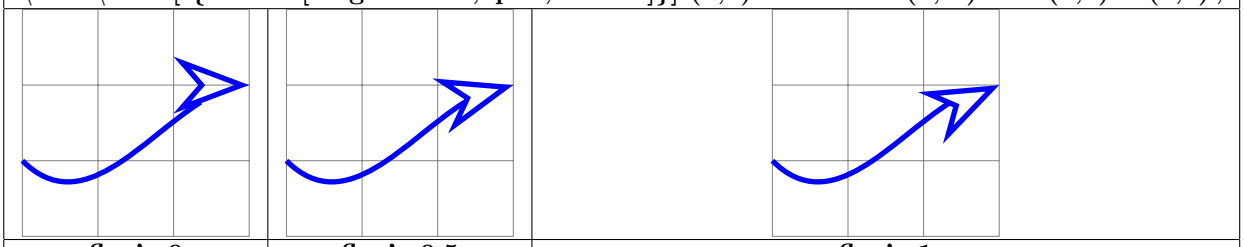
Charger l'extension : \usetikzlibrary{bending}

\tikz \draw[-{Stealth[length=1cm,open,flex=0]}] (0,0) .. controls (1,-1) and (2,1) .. (3,1) ;



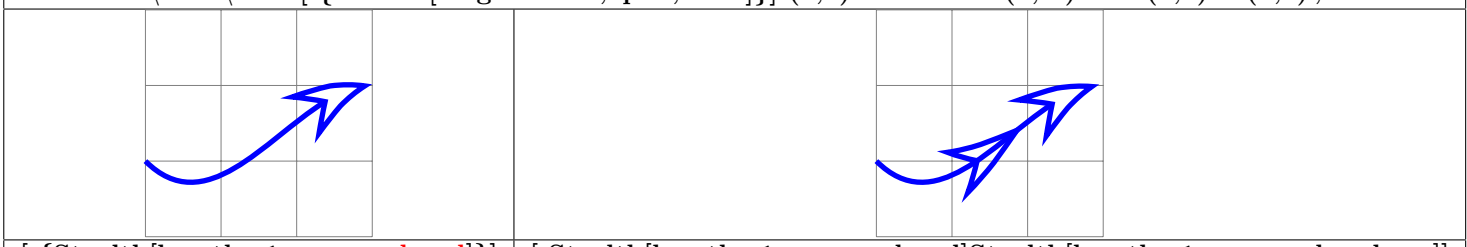
flex=0	flex=0.5	flex=1

\tikz \draw[-{Stealth[length=1cm,open,flex'=0]}] (0,0) .. controls (1,-1) and (2,1) .. (3,1) ;



flex'=0	flex'=0.5	flex'=1

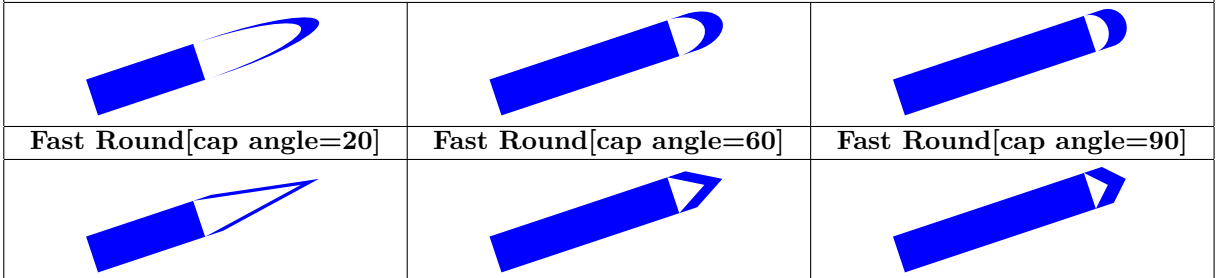
\tikz \draw[-{Stealth[length=1cm,open,bend]}] (0,0) .. controls (1,-1) and (2,1) .. (3,1) ;



[-{Stealth[length=1cm,open,bend]}]	[-Stealth[length=1cm,open,bend]Stealth[length=1cm,open,bend,sep]]

Paramètre cap angle PGFmanual section : 16-5-4

\tikz \draw[-{Fast Round[cap angle=60]},line width=.2cm,blue] (0,0) - - (3,1) ;



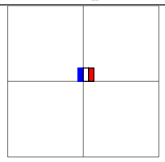
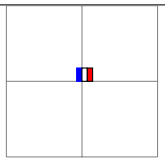
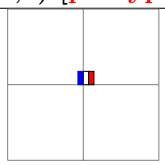
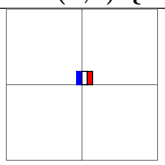
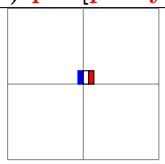
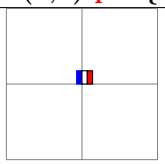
Fast Round[cap angle=20]	Fast Round[cap angle=60]	Fast Round[cap angle=90]
Fast Triangle[cap angle=20]	Fast Triangle[cap angle=60]	Fast Triangle[cap angle=90]

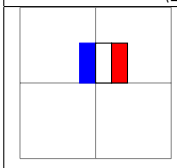
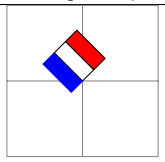
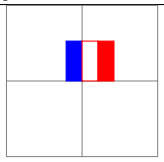
5 Insertion de petites images

5.1 Images créées

PGFmanual section : 14-19 PGFmanual section : 18

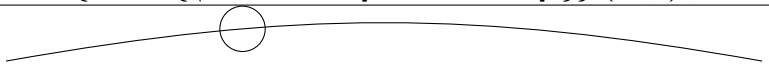
Création	Utilisation
\tikzset{dfr/.pic={\filldraw[blue] (-2pt,0) rectangle (0,5pt) ; \filldraw[fill=white] (0,0) rectangle (2pt,5pt) ; \filldraw[fill=red] (2pt,0) rectangle (4pt,5pt) ; }}	\tikz \pic {dfr} ;

placement à une position	
	
\pic at (1,1) [pic type = dfr] ;	\pic at (1,1) {dfr} ;
	
\path (1,1) pic [pic type= dfr] ;	\path (1,1) pic {dfr} ;
	
\pic [at={(1,1)}] [pic type= dfr] ;	\pic [at={(1,1)}] {dfr} ;

\pic[scale=3] at (1,1) {dfr} ;		
		
[scale=3]	[scale=3,rotate=45]	[scale=3,red]

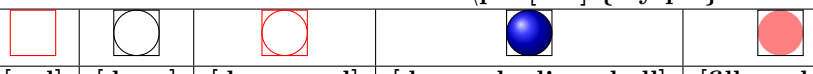
\tikz [scale=4] \pic at (0,0) {dfr} ; \pic at (.5,0) [transform shape] {dfr} ;	

Placement sur un chemin
\tikz \draw (0,0) to [out=10,in=170] pic [near start] {dfr} pic {dfr} pic [sloped, near end] {dfr} (10,0) ;

\draw (0,0) to [out=10,in=170] pic [pos=.3] {code={\draw circle [radius=3mm] ;}} (10,0) ;


```
Définition :
\tikzset{ my pic/.pic = {
\path [pic actions] (0,0) circle[radius=3mm] ;
\draw (-3mm,-3mm) rectangle (3mm,3mm) ; } }
```

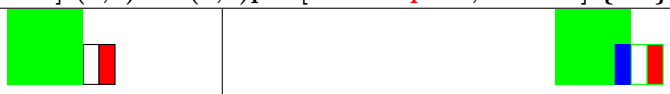
Utilisation : `\pic [red] {my pic}`



[red]	[draw]	[draw=red]	[draw, shading=ball]	[fill=red !50]

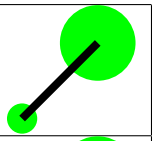
```
\tikz \pic foreach \x in {1,1.5,...,10} at (\x,0) {dfr} ;
```

```
\fill [green] (0,0) - - (1,0)pic [behind path,scale=3] {dfr} – (1,1) – (0,1) – cycle ;
```

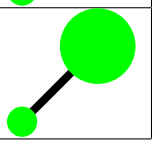


[behind path,scale=3]	[scale=3]

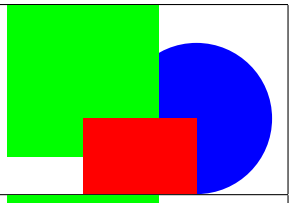
```
\tikzset{ pics/mon cercle/.style = { background code =
{ \fill circle [radius=#1] ; } } }
\tikz [fill=green] \draw[line width=3pt] (0,0) pic {mon
cercle=2mm} - - (1,1) pic {mon cercle=5mm} ;
```



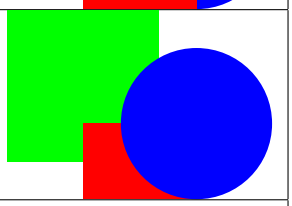
```
\tikzset{ pics/mon cercle/.style = { foreground code =
{ \fill circle [radius=#1] ; } } }
\tikz [fill=green] \draw[line width=3pt] (0,0) pic {mon
cercle=2mm} - - (1,1) pic {mon cercle=5mm} ;
```



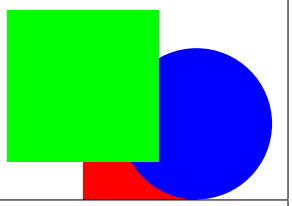
```
\fill [green](-1,0) - - (1,0)
pic [pics/background code={\fill[blue] (0.5,0.5) circle (1cm ) ;}
, pics/code=\fill[red] (-1,-.5) rectangle (0.5,0.5) ; ]
{} - - (1,2) - - (-1,2) - - cycle ;
```



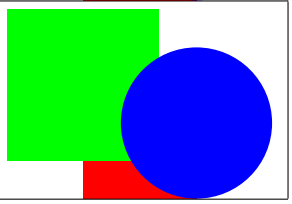
```
\fill [green] (-1,0) - - (1,0)
pic [pics/foreground code=\fill[blue] (0.5,0.5) circle (1cm ) ;
,pics/code={\fill[red] (-1,-.5) rectangle (0.5,0.5) ;} ]
{} - - (1,2) - - (-1,2) - - cycle ;
```



```
\fill [green](-1,0) - - (1,0)
pic [pics/background code={\fill[blue] (0.5 , 0.5) circle (1cm
) ;}
,pics/code={\fill[red] (-1 , -0.5) rectangle (0.5 , 0.5) ;},behind
path ]
{} - - (1,2) - - (-1,2) - - cycle ;
```



```
\fill [green] (-1,0) - - (1,0)
pic [pics/foreground code={\fill[blue] (0.5 , 0.5) circle (1cm ) ;}
, pics/code={\fill[red] (-1,-.5) rectangle (0.5 , 0.5) ;},behind
path ]
{} - - (1,2) - - (-1,2) - - cycle ;
```



5.2 Images prédéfinies : Marquage des angles

PGFmanual section : 39

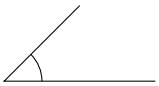
Charger l'extension : \usetikzlibrary{angles}

\tikz \draw (2,0) coordinate (A) - - (0,0) coordinate (B) - - (1,1) coordinate (C) pic [draw] {angle} ;

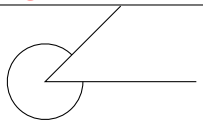
pic [draw] {angle}

pic [fill] {angle}

\tikz \draw (2,0) coordinate (X) - - (0,0) coordinate (Y) - - (1,1) coordinate (Z) pic [draw] {angle= X- -Y- -Z} ;



pic [draw] {angle= X- -Y- -Z}

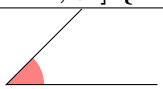


pic [fill] {angle = Z- -Y- -X}

Par défaut : : angle= A- -B- -C

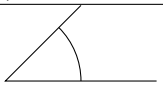
\tikz \draw (2,0) coordinate (A) - - (0,0) coordinate (B) - - (1,1) coordinate (C) pic [draw,->] {angle} ;

pic [draw,->] {angle}

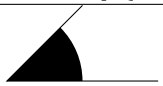


pic [fill,fill=red !50] {angle}

\tikz \draw (2,0) coordinate (A) - - (0,0) coordinate (B) - - (1,1) coordinate (C) pic [draw,angle radius=1cm] {angle} ;



pic [draw,angle radius=1cm] {angle}

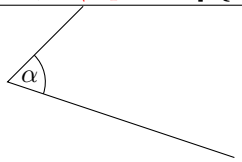


pic [fill,angle radius=1cm] {angle}

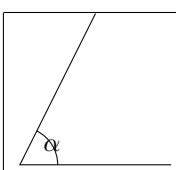
Par défaut : : angle radius=5mm

Charger l'extension : \usetikzlibrary{quotes}

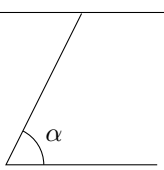
\tikz \draw (3,0) coordinate (A) - - (0,1) coordinate (B) - - (1,2) coordinate (C) pic [draw,"α "] {angle} ;



\tikz \draw (2,0) coordinate (A) - - (0,0) coordinate (B) - - (1,2) coordinate (C) pic [draw, " α", angle eccentricity=1]] {angle} ;



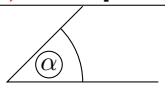
angle eccentricity=1



angle eccentricity=1.5

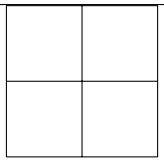
Par défaut : : angle eccentricity= 0.6

```
\tikz { \draw (2,0) coordinate (A) - - (0,0) coordinate (B) - - (1,2) coordinate (C)
pic (xxx) [draw,"$\alpha$",angle radius= 1cm ] {angle} ;
\draw (xxx)circle [radius=5pt] ; }
```



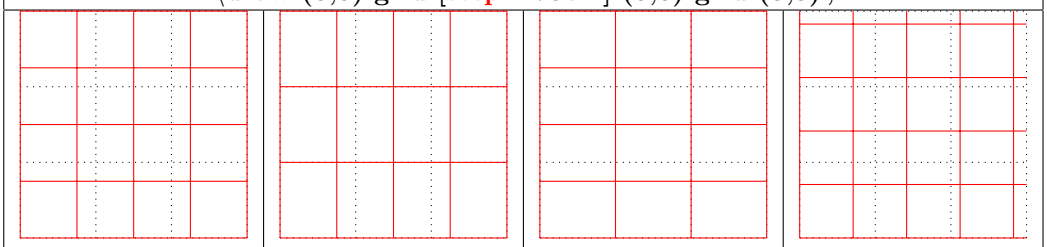
6 Les coordonnées

6.1 Quadrillage



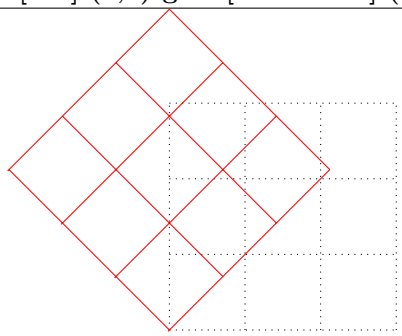
\draw (0,0) grid (2,2) ; PGFmanual section : 14-8

\draw (0,0) grid [step=.75cm] (0,0) grid (3,3) ;

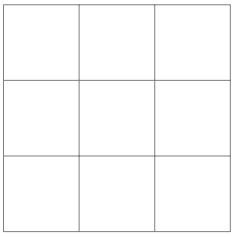


step=.75cm | x step=.75cm | ystep=.75cm | step=(45:1)

\draw[red] (0,0) grid [rotate=45] (3,3) ;



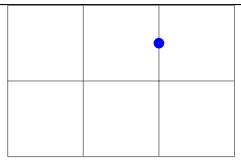
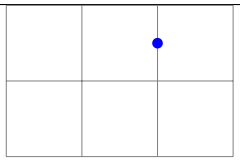
\draw[help lines] (0,0) grid (3,3) ;



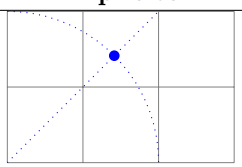
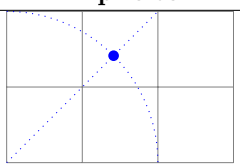
6.2 Coordonnées

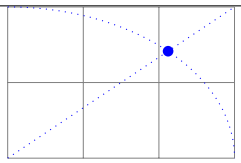
PGFmanual section : 13-2-1

6.2.1 Système de coordonnées « canvas »

Explicite	Implicite
	
\fill (canvas cs :x=2cm,y=1.5cm) circle (2pt) ;	\fill (2cm,1.5cm) circle (2pt) ;

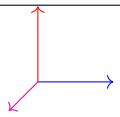
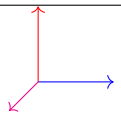
6.2.2 Système de coordonnées polaire « canvas »

Explicite	Implicite
	
\fill (canvas polar cs :angle=45,radius=2cm) circle (2pt) ;	\fill (45:2cm) circle (2pt) ;

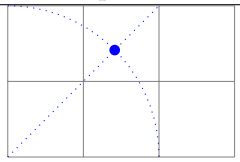
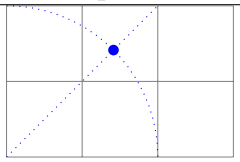


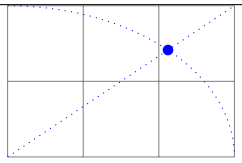
\fill (canvas polar cs:angle=45,x radius=3cm,y radius=2cm) circle (2pt) ;

6.2.3 Système de coordonnées xyz

	
\draw (0,0) - - (xyz cs:x=1) ; \draw[red] (0,0) - - (xyz cs:y=1) ; \draw[magenta] (0,0) - - (xyz cs:z=1) ;	\draw (0,0) - - (1,0,0) ; \draw[red] (0,0) - - (0,1,0) ; \draw[magenta] (0,0) - - (0,0,1) ;

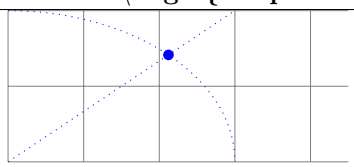
6.2.4 Coordinate system xyz polar

Explicite	Implicite
	
\fill (xyz polar cs :angle=45,radius=2) circle (2pt) ;	\fill (45:2cm) circle (2pt) ;

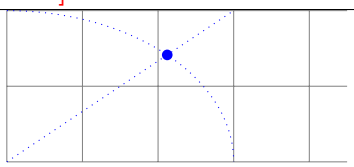


\fill (xyz polar cs:angle=45,x radius=3,y radius=2) circle (2pt) ;

\begin{tikzpicture}[x=1.5cm,y=1cm]

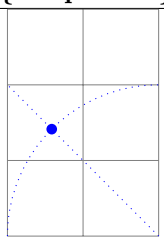


\fill (xyz polar cs :angle=45,radius=2) circle (2pt) ;

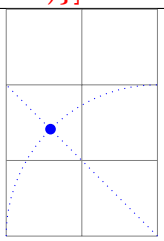


\fill (45:2cm) circle (2pt) ;

\begin{tikzpicture}[x={(0cm,1cm)},y={(-1cm,0cm)}]



\fill (xyz polar cs :angle=45,radius=2) circle (2pt) ;

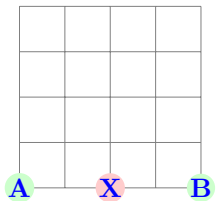
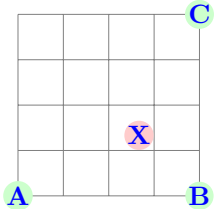
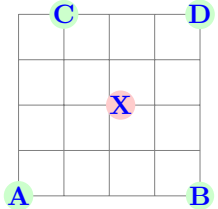
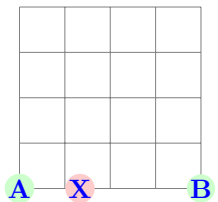
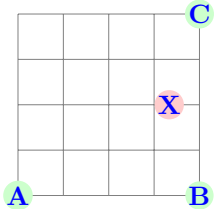
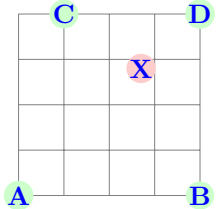


\fill (45:2cm) circle (2pt) ;

6.2.5 Coordonnées barycentriques

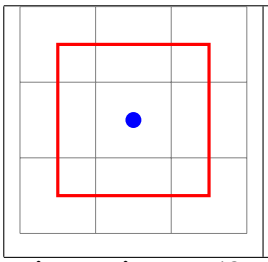
PGFmanual section : 13-2-2

\node [circle,fill=red !20] at (barycentric cs:A=0.6,B=0.3) {X} ;

		
A=0.3,B=0.3	A=0.4,B=0.4 ,C=.4	A=0.5,B=0.5,C=.5,D=.5
		
A=0.6,B=0.3	A=0.2,B=0.4 ,C=.6	A=0.2,B=0.4,C=.6,D=.8

6.2.6 Coordonnées nominatives : nœud

PGFmanual section : 13-2-3



```
\coordinate (centre) at(1.5,1.5) ;
\coordinate (A) at (.5,.5) ;
\coordinate (B) at (2.5,2.5) ;

\fill (centre) circle (3pt) ;
\draw[red] (A) rectangle (B) ;
```

voir aussi page 49

6.2.7 Coordonnées relatives à un noeud

```
\node [draw,fill=green !20,] (A) at (1,1) {\huge noeud} ;
\fill[red] (node cs :name=A,anchor=south) circle (3pt) ;
```

name=A,anchor=south	name=A,anchor=west	name=A,anchor=north	name=A,anchor=east

```
\node [draw,fill=green !20,] (A) at (1,1) {\huge noeud} ;
\fill[red] (A.south) circle (3pt) ;
```

A.south	A.west	A.north	A.east

```
\fill[red] (node cs :name=A,angle=0) circle (3pt) ;
```

name=A,angle=0	name=A,angle=-30	nname=A,angle=-90	name=A,angle=-150

```
\fill[red] (A.0) circle (3pt) ;
```

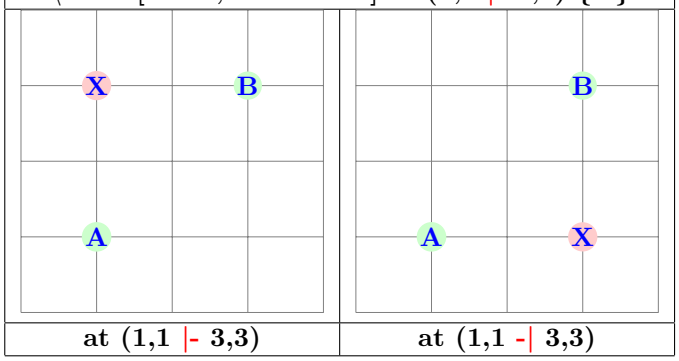
A.0	A.-30	A.-90	A.-150

voir aussi page 105

6.2.8 Coordonnées relatives à deux points

PGFmanual section : 13-3-1

```
\node [circle,fill=red !20] at (1,1 |- 3,3) {X}
```



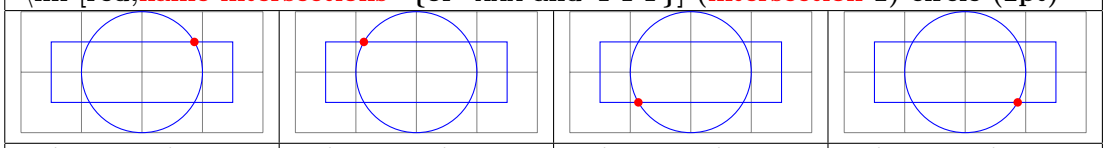
at (1,1 |- 3,3) | at (1,1 -| 3,3)

6.2.9 Coordonnée relative à une intersection

PGFmanual section : 13-3-2

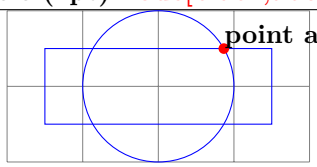
Charger l'extension : \usetikzlibrary{intersections}

```
\draw [name path=XXX] (2,1) circle (1cm);
\draw [name path=YYY] (0.5,0.5) rectangle +(3,1);
\fill [red,name intersections={of=xxx and YYY}] (intersection-1) circle (2pt)
```

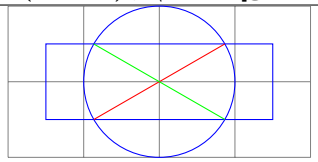


intersection-1 | intersection-2 | intersection-3 | intersection-4

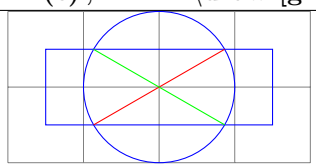
```
\fill [red, name intersections={of=XXX and YYY}]
(intersection-1) circle (2pt) node[black,above right] {point a};
```



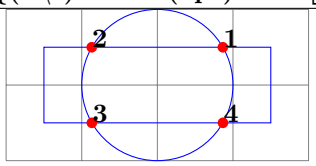

```
\fill [red, name intersections={of=XXX and YYY, name=ZZZ}];
\draw [red] (ZZZ-1) - - (ZZZ-3); \draw [green] (ZZZ-2) - - (ZZZ-4);
```



```
\fill [red, name intersections={of=XXX and YYY , by={a,b,c,d}}];
    \draw [red] (a) - - (c);        \draw [green] (b) - - (d);
```



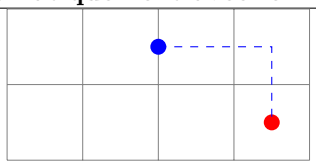
```
\fill [name intersections={of=XXX and YYY, name=i, total=\t}] [red]
\foreach \s in {1,...,\t} {(i-\s) circle (2pt) node[black,above right] {\s}}
```



6.2.10 Position calculée avec le module « pgfmath »

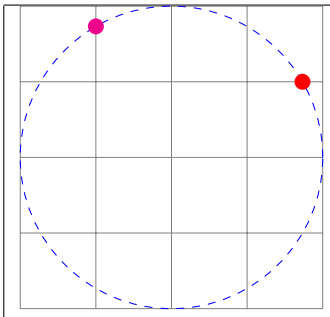
PGFmanual section : 13-2-1

Ce module est chargé automatiquement avec le module Tikz



Explicite : \fill [red] (canvas cs:x=2cm+1.5cm,y=1.5cm-1cm) circle (3pt) ;

Implicite : \fill [red] (2cm+1.5cm,1.5cm-1cm) circle (3pt) ;

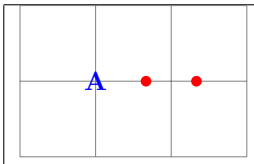


```
\draw[dashed] (2,2) circle (2) ;
\fill [red](2+ 2*cos 30 , 2+2*sin 30) circle
(3pt) ;
\fill[magenta] (2+2*cos{(120)} ,
2+2*sin{(120)}) circle (3pt) ;
```

6.2.11 Position calculée avec « library calc »

PGFmanual section : 13-5

Charger l'extension : \usetikzlibrary{calc}

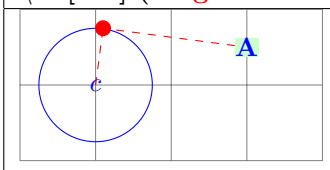



```
\node (a) at (1,1) {A} ;
\fill [red] ($(a) + 2/3*(1cm,0)$) circle (2pt) ;
\fill [red] ($(a) + 4/3*(1cm,0)$) circle (2pt) ;
```

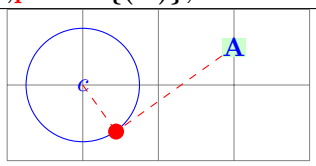
6.2.12 Tangentes avec « library calc »

PGFmanual section : 13-2-4

```
\node[fill=green !20] (a) at (3,1.5) {A} ;
\fill[red] (tangent cs :node=c,point={(A)},solution=1) ;
```



solution=1

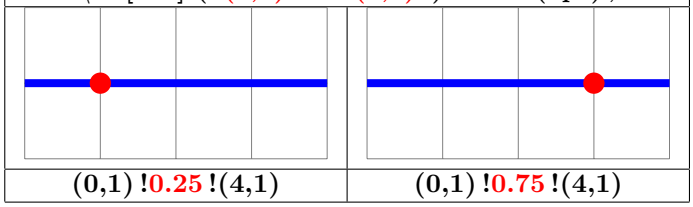


solution=2

6.2.13 Point à pourcentage donné

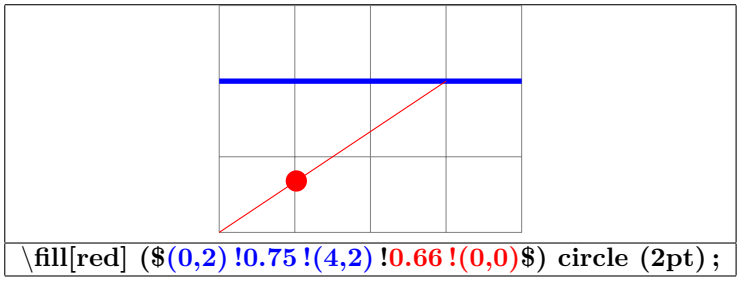
PGFmanual section : 13-5-3

```
\fill[red] ($(0,1) !.25 !(4,1)$) circle (4pt) ;
```



```
(0,1) !0.25 !(4,1)
```

```
(0,1) !0.75 !(4,1)
```

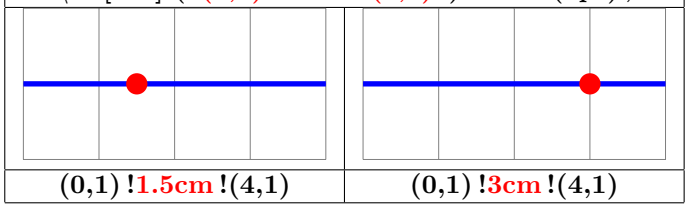


```
\fill[red] ($(0,2) !0.75 !(4,2) !0.66 !(0,0)$) circle (2pt) ;
```

6.2.14 Point à distance donnée

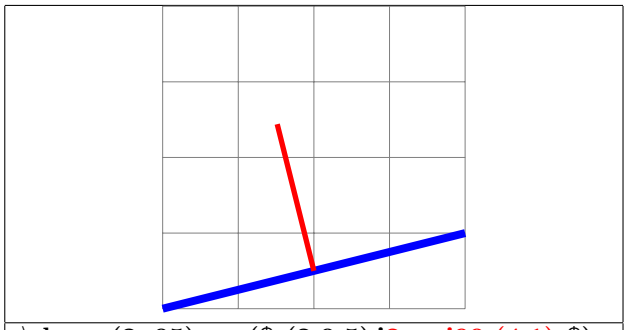
PGFmanual section : 13-5-4

```
\fill[red] ($(0,1) !1.5cm !(4,1)$) circle (4pt) ;
```



```
(0,1) !1.5cm !(4,1)
```

```
(0,1) !3cm !(4,1)
```

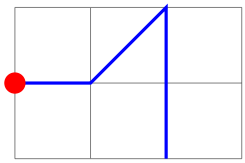
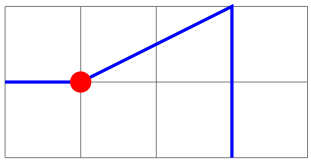
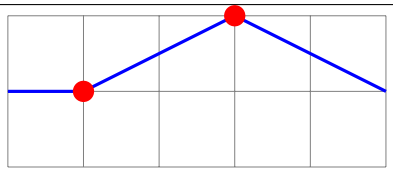


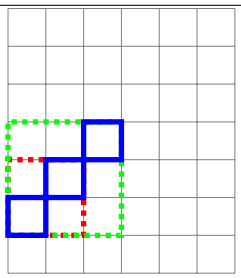
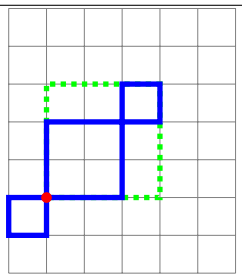
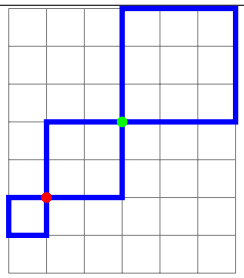
```
\draw (2,.05) - - ($ (2,0.5) !2cm !90:(4,1) $) ;
```

6.2.15 Coordonnées relatives

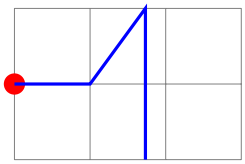
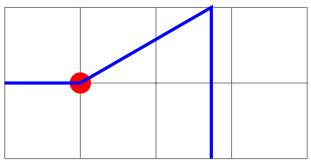
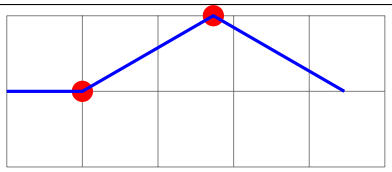
Cartésienne

PGFmanual section : 13-4-1

relative à l'origine	relative à une position	relative à la dernière position
		
(0,0) - - (1,0) - - (2,1) - - (2,-1)	(0,0) - - (1,0) - - +(2,1) - - +(2,-1)	(0,0) - - (1,0) - - ++(2,1) - - ++(2,-1)

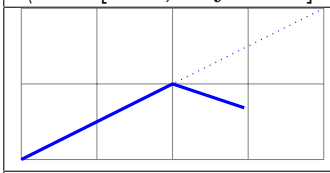
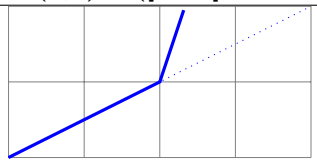
		
\draw (0,0) rectangle (1,1) rectangle (2,2) rectangle (3,3) ;	\draw (0,0) rectangle (1,1) rectangle +(2,2) rectangle +(3,3) ;	\draw (0,0) rectangle (1,1) rectangle ++(2,2) rectangle ++(3,3) ;

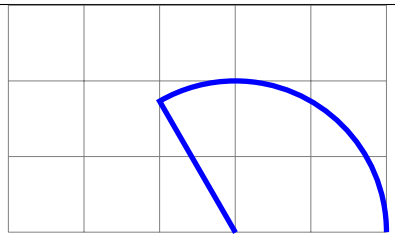
Polaire

relative à l'origine	relative à une position	relative à la dernière position
		
(0:0) - - (0:1) - - (30:2) - - (-30:2)	(0:0) - - (0:1) - - +(30:2) - - +(-30:2)	(0:0)- - (0:1) - - ++(30:2) - - ++(-30:2)

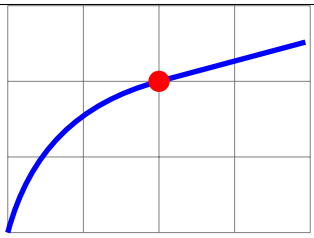
coordonnée relative en polaire

PGFmanual section : 13-4-2

\draw[blue,very thick] (0,0) – (2,1) – ([turn]-45:1cm) ;	
	
([turn]-45:1cm)	([turn]45:1cm)

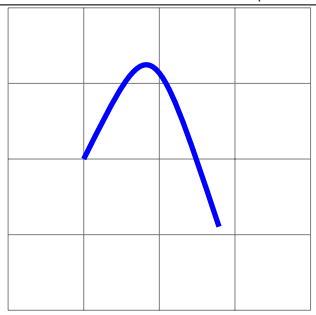


\draw (4,0) arc (0 :120 :2) - - ([turn]90:2cm) ;

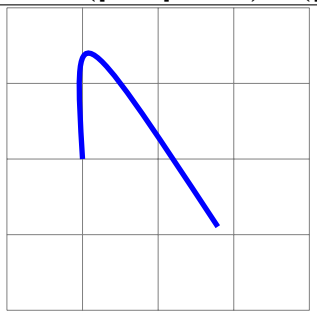


\draw (0,0) to [bend left] (2,2) - - ([turn]0:2cm) ;

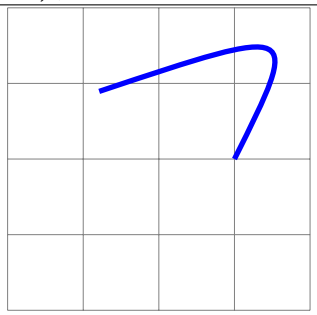
\draw(1,2) .. controls ([turn]0:2cm) .. ([turn]-90:2cm) ;



([turn]0:2cm) .. ([turn]-90:2cm)



([turn]30:2cm) .. ([turn]-90:2cm)

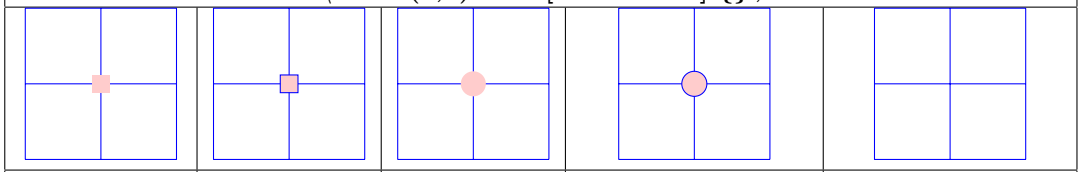


([turn]0:2cm) .. ([turn]90:2cm)

7 Les nœuds

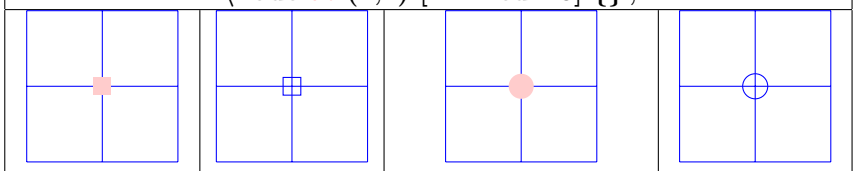
7.1 Définition des nœuds

```
\draw (1,1) node[fill=red !20] {};
```



Par défaut : | node[draw] | node[circle] | node[circle,draw] | node[coordinate]

```
\node at (1,1) [fill=red !20] {};
```



[fill=red !20] | [draw] | [circle,fill=red !20] | [circle,draw]

Autres types de nœuds voir page 90

```
\draw (0,0) node at (1,0) {1} node at (2,0) {2}
node at (3,0) {3} node at (4,0) {4} node at (5,0) {5};
```

1 2 3 4 5

```
\draw(0,0) node foreach \x in {1,2,...,5}
at (\x,0) {\x};
```

1 2 3 4 5

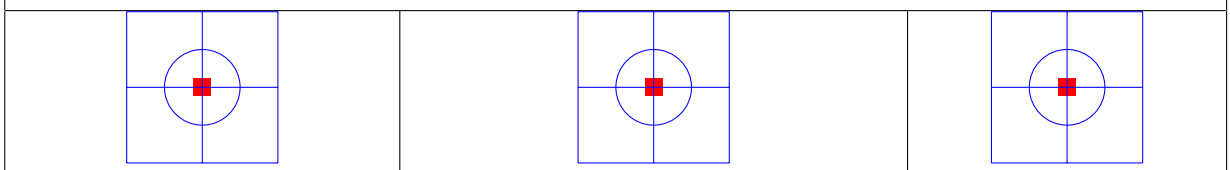
```
\draw[every node/.style={draw,red}](0,0) node foreach \x in {1,2,...,5} at (\x,0) {\x};
```

1 2 3 4 5

```
\draw[every rectangle node/.style={draw,red},
every circle node/.style={draw,double}]
(0,0) node at (1,0) {1} node[circle] at (2,0) {2}
node[circle] at (3,0) {3} node at (4,0) {4} node at (5,0) {5};
```

1 2 3 4 5

7.2 Nom des nœuds



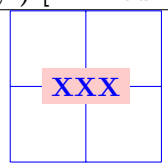
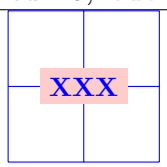
```
\node[name=A] at (0,0) {}
\draw (A) circle (.5);
```

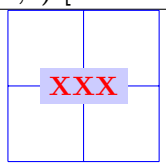
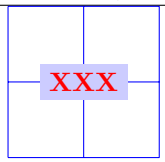
```
\node[name=A,alias=B] at (0,0) {}
\draw (B) circle (.5);
```

```
\node(C) at (0,0) {}
\draw (C) circle (.5);
```

7.3 Contenu des nœuds

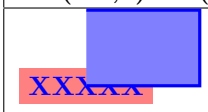
PGFmanual section : 17-2-1

\node at (1,1) [fill=red !20]{XXX} ;	\node at (1,1) [fill=red !20,node contents=XXX] {} ;
	

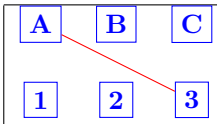
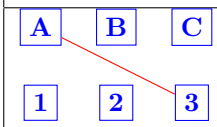
\node[red] at (1,1) [fill=blue !20] {XXX} ;	\node[red] at (1,1) [fill=blue20,node contents=XXX] {} ;
	

7.4 Premier ou arrière plan

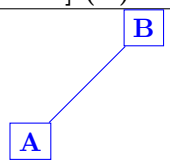
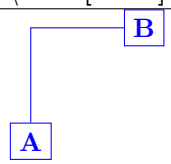
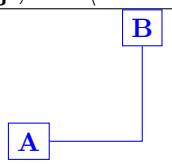
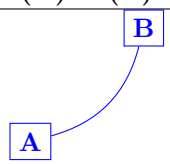
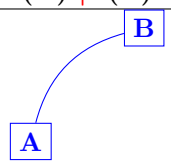
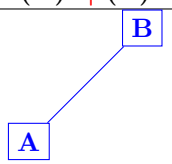
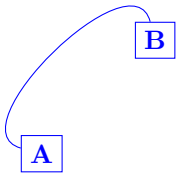
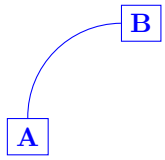
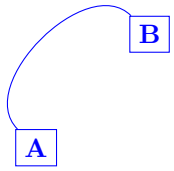
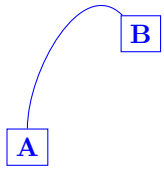
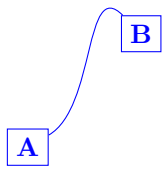
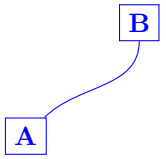
\tikz \fill [fill=blue !50, draw=blue, very thick] (0,0)
node [behind path, fill=red !50] {XXXXX}
- - (1.5,0) - - (1.5,1) - - (0,1) ;

	
behind path	in front of path

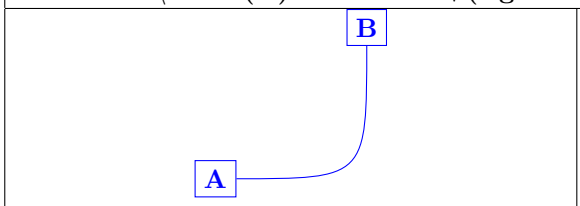
7.5 Noms à préfixe ou suffixe

	\draw[name prefix = top-] node (A) at (1,1) {A} node (B) at (2,1) {B} node (C) at (3,1) {C} ; \draw[name prefix = bottom-] node (1) at (1,0) {1} node (2) at (2,0) {2} node(3) at (3,0) {3} ; \draw [red] (top-A) – (bottom-3) ;
	\draw[name suffix = -top] node (A) at (1,1) {A} node (B) at (2,1) {B} node (C) at (3,1) {C} ; \draw[name suffix = -bottom] node (1) at (1,0) {1} node (2) at (2,0) {2} node(3) at (3,0) {3} ; \draw [red] (A -top) - - (3 -bottom) ;

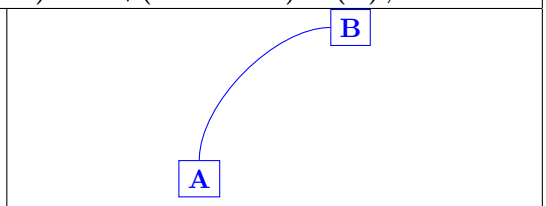
7.6 Liaisons

\node[draw] (A) at (0,0) {A}; \node[draw] (B) at (1.5,1.5) {B}; \draw (A) - - (B)		
		
(A)- - (B)	(A) |- (B)	(A) -| (B)
		
(A) to [bend right] (B)	(A) to [bend left] (B)	(A) to[bend left=0] (B)
		
(A) to[bend left=120] (B)	(A) to[bend left=45] (B)	(A) to[bend left=90] (B)
		
(A) to[out=90] (B)	(A) to[out=30] (B)	(A) to[in=-90] (B)

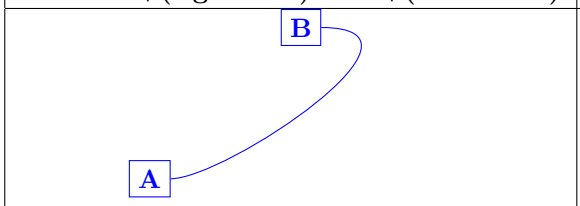
\draw (A) .. controls +(right:2cm) and +(down:2cm) .. (B);



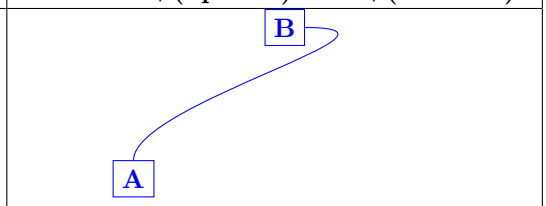
controls +(right:2cm) and +(down:2cm)



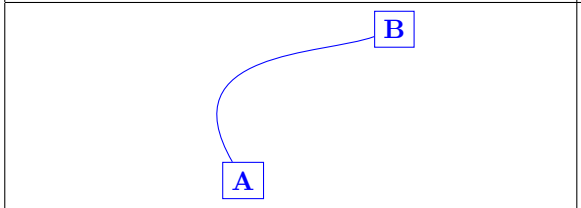
controls +(up:1cm) and +(left:1cm)



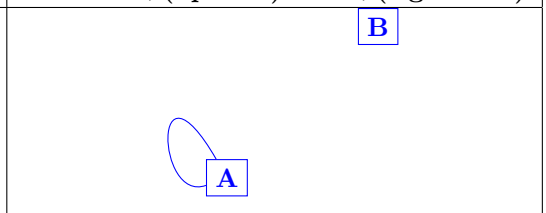
controls +(right:1cm) and +(right:2cm)



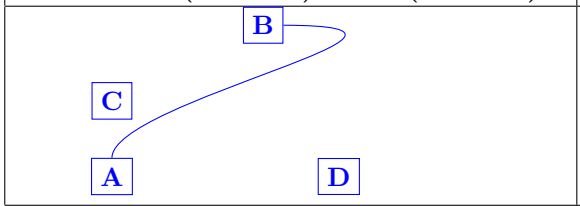
controls +(up:1cm) and +(right:2cm)



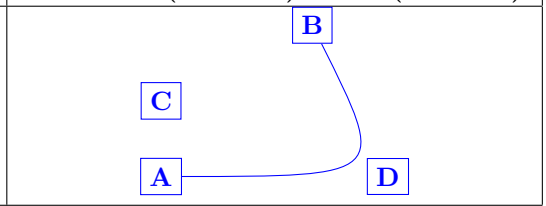
controls +(120:2cm) and +(200:1cm)



controls +(120:2cm) and +(200:1cm)



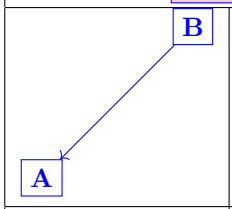
controls +(C) and +(D)



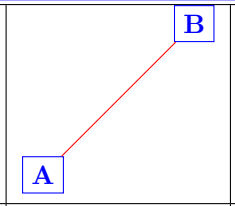
controls +(D)

\node[draw] (A) at (0,0) {A}
\node[draw] (B) at (2,2) {B} edge [->] (A);

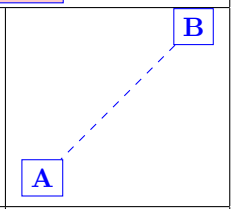
PGFmanual section : 17-12-1



[->]

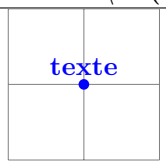
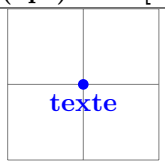
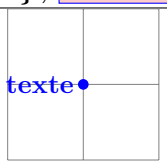
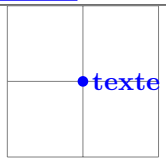
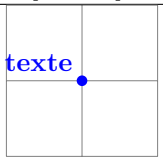
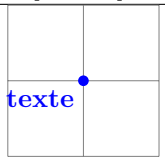
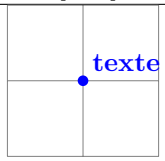
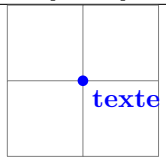
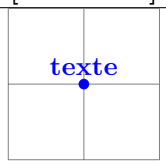
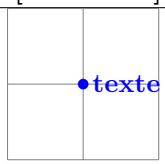
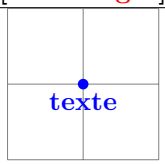
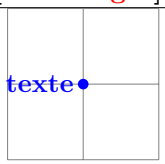
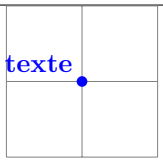
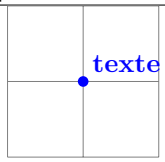
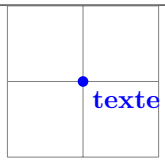
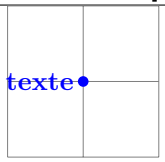


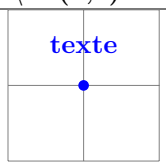
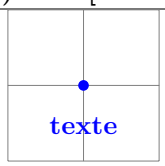
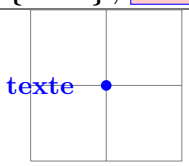
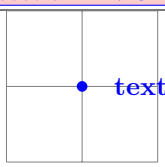
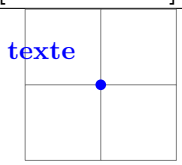
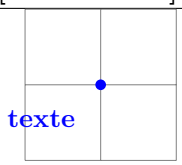
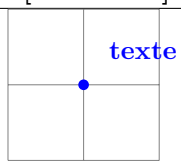
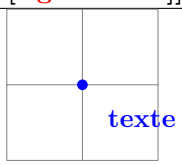
[red]



[dashed]

7.7 Étiquettes sur les nœuds

\fill(0,0) circle (2pt) node[above] {texte} ; PGFmanual section : 17-5-2			
			
[above]	[below]	[left]	[right]
			
[above left]	[below left]	[above right]	[below right]
			
[anchor=south]	[anchor=west]	[anchor=north]	[anchor=east]]
			
[anchor=south east]	[anchor=south west]	[anchor=north west]	[anchor==north east]

\fill(0,0) circle (2pt) node[above=.3cm] {texte} ; PGFmanual section : 17-5-2			
			
[above=.3cm]	[below=.3cm]	[left=.3cm]	[right=.3cm]]
			
[above left=.3cm]	[below left=.3cm]	[above right=.3cm]	[below right=.3cm]]

\shorthandoff{:} [1]
\node [draw,label=right:texte] {}
\shorthandon{:}

texte	texte	texte	texte	texte
label=right	label=left	label=above	label=below	label=45

```
\fill(0,0) circle (2pt) node[below right=.3cm,draw,label=45:étiquette] {texte};
```

étiquette
texte

7.8 Étiquettes épinglées

PGFmanual section : 17-10-3

\shorthandoff{:} \node[circle,draw,blue,pin=texte] {}; \shorthandon{:} [1]

texte	texte	texte
[circle,pin=texte]	[circle,pin=60:texte]	[circle,pin=right:texte]

\tikz[pin position=60] \node [circle,pin=texte] {};

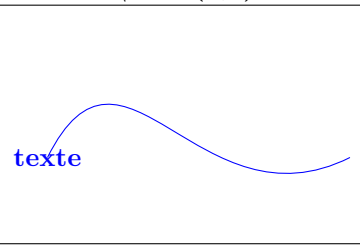
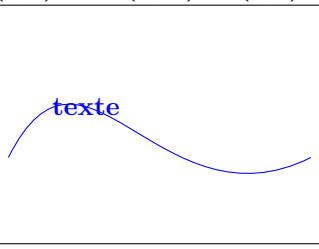
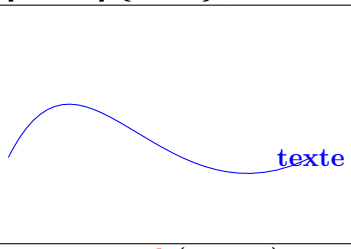
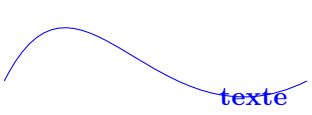
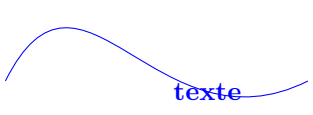
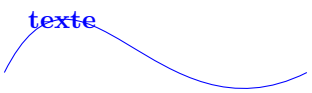
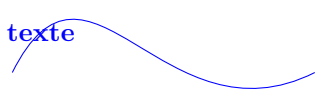
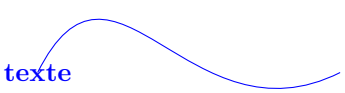
texte	texte	texte
[pin position=60]	[pin distance=0 cm]	[pin distance=2 cm]
Par défaut : : above	Par défaut : : 3 ex	

[1] désactivation et ré-activation de « : » conflit entre les modules Tikz et Babel en français

7.9 Nœuds sur un chemin

PGFmanual section : 17-8

\draw(0,0) .. controls (1,2) and (2,-1) .. (4,0) node[at end] {texte} ;

		
pos=0	pos=.33	at end (pos=1)
		
very near end (pos=0.875.)	near end (pos=0.75)	midway (pos=0.5)
		
near start (pos=0.25)	very near start (pos=0.125)	at start (pos=0)

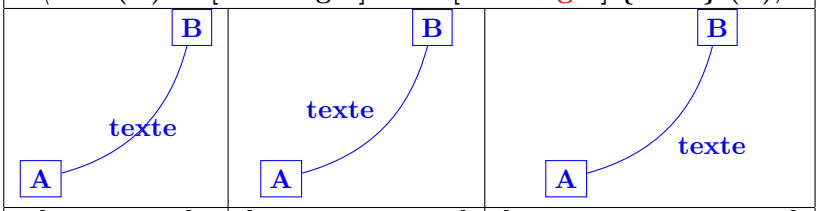
\draw(0,0) .. controls (1,2) and (2,1) .. (4,0) node[sloped,midway] {texte} ;

		
sloped	above	below

\draw(0,0) .. controls (1,2) and (2,1) .. (5,0) node[sloped,midway,allow upside down] {texte} ;

		
sloped	above	below

\draw(A) to [bend right] node [bend right] {texte} (B);

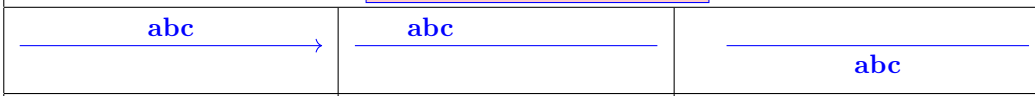


[bend right] | [auto,bend right] | [auto,swap,bend right]

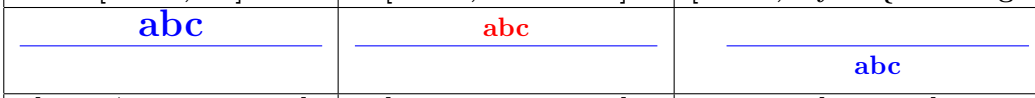
7.10 Nœuds sur un “edge”

\draw(0,0) edge [”abc”, ->] (4,0);

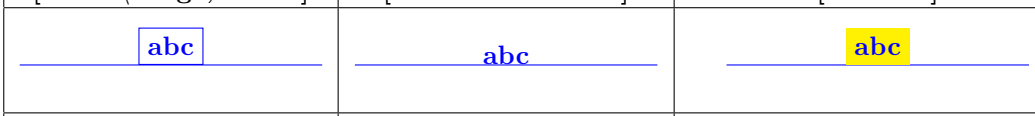
PGFmanual section : 17-12-2



[”abc”, ->] | [”abc”, near start] | [”abc”, style={auto=right}]



[font=\Large,”abc”] | [”abc” color=red] | [”abc” ’]



[”abc” draw] | [”abc” inner sep=0pt] | [”abc” fill ,fill=yellow]

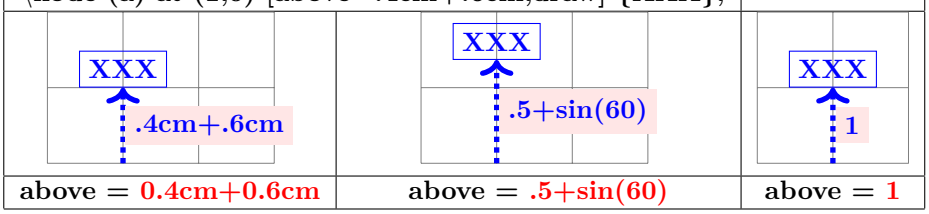
\draw[every edge quotes/.style={fill=yellow}] (0,0) edge [”abc”] (4,0);

7.11 Positionnement relatif de nœuds

Charger l’extension: \usetikzlibrary{positioning}

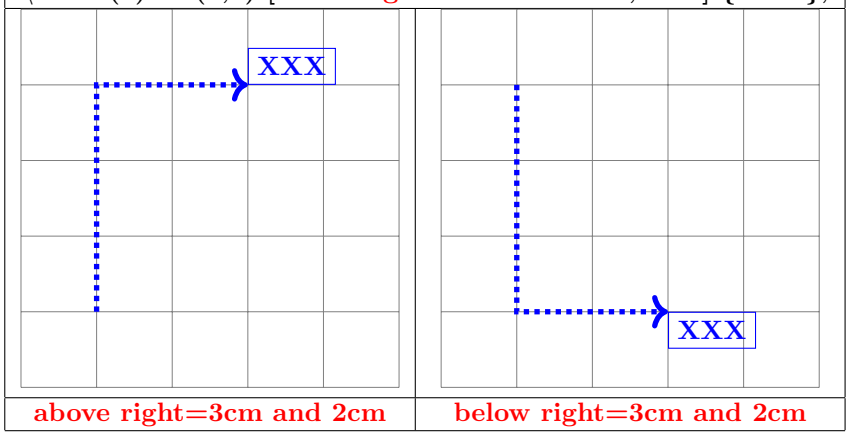
PGFmanual section : 17-5-3

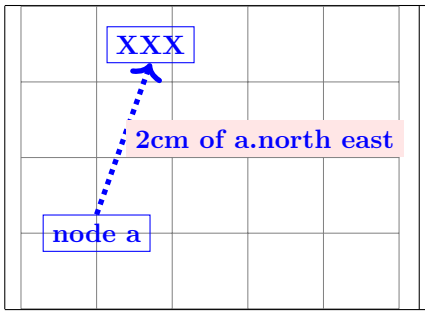
\node (a) at (1,0) [above=.4cm+.6cm,draw] {XXX};



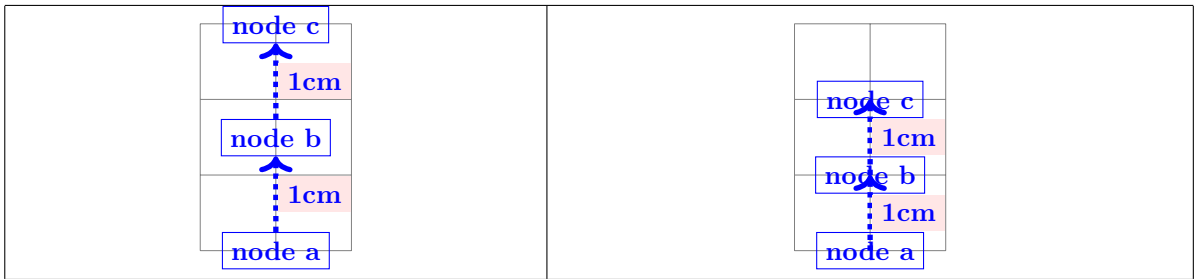
above = 0.4cm+0.6cm | above = .5+sin(60) | above = 1

```
\node (a) at (1,0) [above right=3cm and 2cm,draw] {XXX};
```



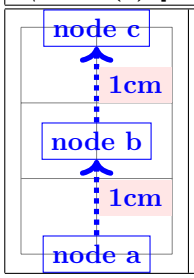



```
\node (a) at (1,1) {node a};
\node (b) [above=2cm of a.north east] {XXX};
```

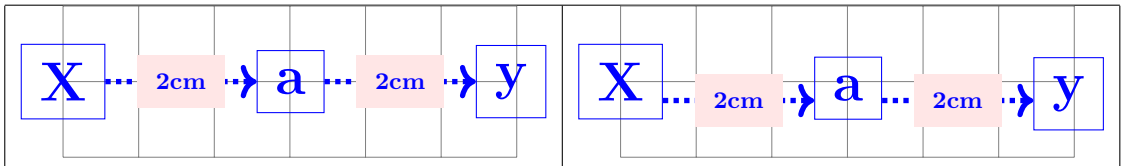



```
\node (a) at (1,0) {node a};
\node (b) [above=1cm of a] {node b};
\node (c) [above=1cm of b] {node c};
```

```
\node (a) at (1,0) {node a};
\node (b) [on grid,above=1cm of a] {node b};
\node (c) [on grid,above=1cm of b] {node c};
```




```
\begin{tikzpicture}[every node/.style=draw,node distance=1mm]
\node (a1) at (1,0) {node a};
\node (b) [above=of a] {node b};
\node (c) [above=of b] {node c};
\end{tikzpicture}
```



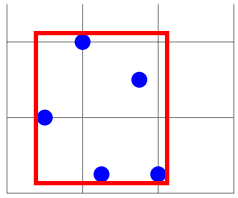

```
\node[draw] (X) at (0,0) {X};
\node[draw] (a) [right=of X] {a};
\node[draw] (y) [right=of a] {y};
```

```
\node[draw] (X) at (0,0) {X};
\node[draw] (a) [base right=of X] {a};
\node[draw] (y) [base right=of a] {y};
```

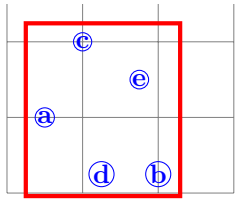
7.12 Nœud enveloppant

Charger l'extension: \usetikzlibrary{fit}

PGFmanual section : 52

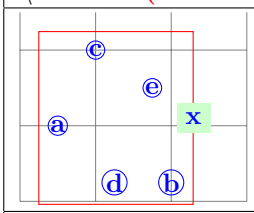


```
\fill  (.5,1) circle (3pt);
\fill  (2,.25) circle (3pt);
\fill  (1,2) circle (3pt);
\fill  (1.25,0.25) circle (3pt);
\fill  (1.75,1.5) circle (3pt);
\node[draw=red,ultra  thick,fit={(.5,1)  (2,.25)  (1,2)
(1.25,0.25) (1.75,1.5) }] {} ;
```

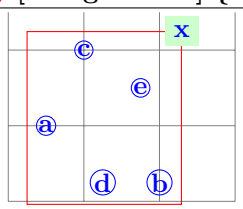



```
[dot/.style={inner sep=0pt,draw,circle,blue}]
\node[dot] (a) at (.5,1) {a};
\node[dot] (b) at (2,.25) {b};
\node[dot] (c) at (1,2) {c};
\node[dot] (d) at (1.25,0.25) {d};
\node[dot] (e) at (1.75,1.5) {e};
\node[draw=red,ultra thick,fit=(a) (b) (c) (d) (e)] {}
```

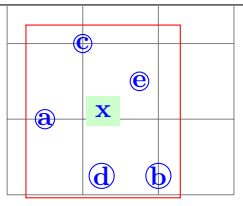
```
\node[draw=red,ultra thick,fit=(a) (b) (c) (d) (e)] (xxx) {}
\node at (xxx.east) [fill=green!20] {x};
```



xxx.east

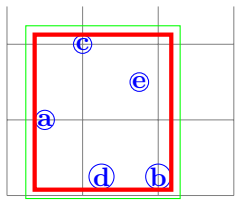


xxx.north east

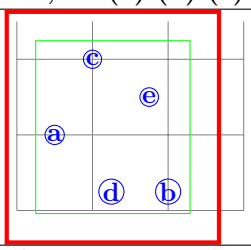


xxx.center

```
\node [draw=green,fit=(a) (b) (c) (d) (e)] ;
\node [inner sep=0pt,draw=red,fit=(a) (b) (c) (d) (e)] ;
```

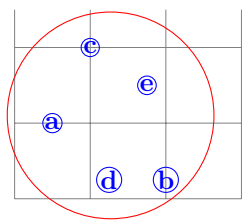


inner sep=0pt

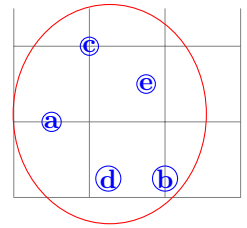


inner sep=.5cm

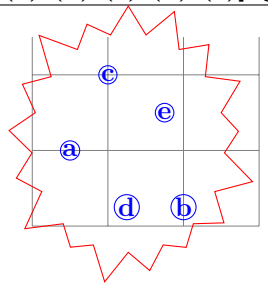
```
\node[circle,draw=red,inner sep=0pt,fit=(a) (b) (c) (d) (e)] {};
```



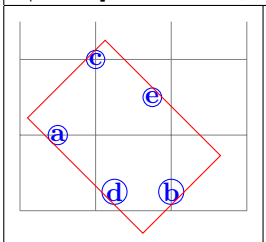
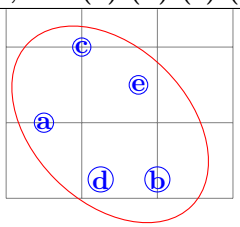
circle



ellipse



shape=starburst (voir section 17)

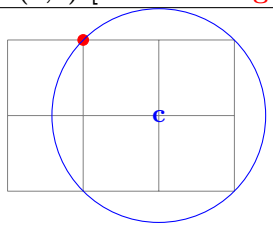
\node[draw=red, rotate fit=45, fit=(a) (b) (c) (d) (e)] {};	
	
rotate fit=45	**ellipse, rotate fit=45**

7.13 Cercle défini par deux points

Charger l'extension: \usetikzlibrary{through}

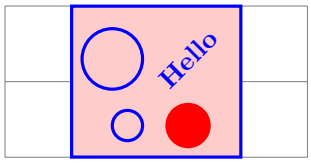
PGFmanual section : 71

```
\node [draw] at (2,1) [circle through={(1,2)}] {c};
```

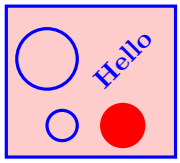


7.14 Matrice de nœuds

PGFmanual section : 20



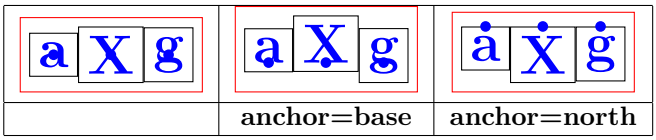

```
\node [matrix,fill=red!10,draw=blue,very thick] at (2,1)
{
\draw (0,0) circle (4mm); & \node [rotate=45] Hello; \\
\draw (0.2,0) circle (2mm); & \fill[red] (0,0) circle
(3mm); \\
};
```



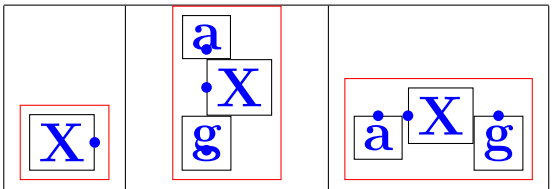

```
\matrix [fill=red!10,draw=blue,very thick]
{
\draw (0,0) circle (4mm); & \node [rotate=45] Hello; \\
\draw (0.2,0) circle (2mm); & \fill[red] (0,0) circle
(3mm); \\
};
```

7.14.1 Alignement des cellules

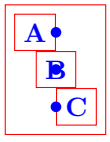
PGFmanual section : 20-3



	anchor=base	anchor=north

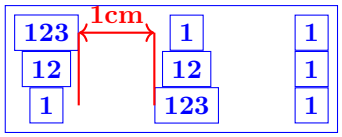


	anchor=base	anchor=north

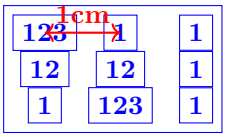



```
\matrix [draw=red,nodes=draw] {
\node[left] A; \fill[blue] (0,0) circle (2pt); \ \
\node B; \fill[blue] (0,0) circle (2pt);\ \
\node[right] C; \fill[blue] (0,0) circle (2pt); \ \
};
```

```
\matrix [draw,column sep=1cm,nodes=draw]
```

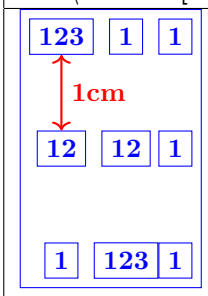


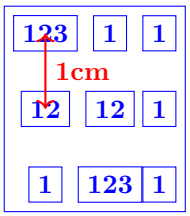
column sep=1cm



column sep={1cm,between origins }

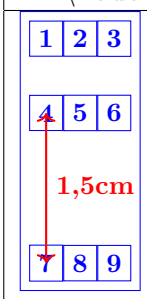
\matrix [draw,row sep=1cm,nodes=draw]

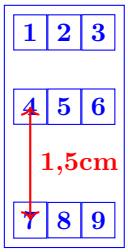




row sep=1cm | row sep={1cm,between origins }

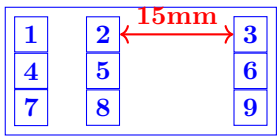
\matrix [row sep=5mm,draw,nodes=draw]
{ \node {1}; & \node {2}; & \node {3}; \\
\node {4} ; & \node {5}; & \node {6}; \\ [1cm]
\node {7}; & \node{8}; & \node{9}; \\ }

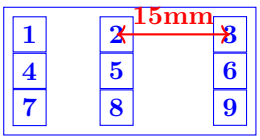




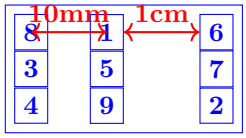
[1cm] | [1cm,between origins]

\matrix [column sep=5mm,draw,nodes=draw]
{ \node {1}; & \node {2}; & \node {3}; \\
\node {4} ; & \node {5}; & [1cm]\node {6}; \\
\node {7}; & \node{8}; & \node{9}; \\ }





[1cm] | [1cm,between origins]



7.14.2 Format des cellules

\matrix [nodes=draw,nodes={fill=blue!10,minimum size=1cm}]

1	2	3
4	5	6
7	8	9

\matrix[row 2/.style={red}]		
8 1 6 3 5 7 4 9 2	8 1 6 3 5 7 4 9 2	8 1 6 3 5 7 4 9 2
row 2/.style={red}	column 2/.style={red}	row 2 column 2/.style={red}

\matrix[column 1/.style={anchor=west}]		
12345 67890 123 67 1 6	12345 67890 123 67 1 6	12345 67890 123 67 1 6
[column 1/.style=anchor=west]	[column 1/.style=anchor=east]	[column 1/.style=anchor=base]

\matrix[matrix of nodes,every odd column/.style=red]			
a b c d e f g h i j k l	a b c d e f g h i j k l	a b c d e f g h i j k l	a b c d e f g h i j k l
every odd column	every even column	every odd row	every even row

\matrix [draw,matrix of nodes,execute at begin cell={(}]
(1 (2 (4 (6 (9

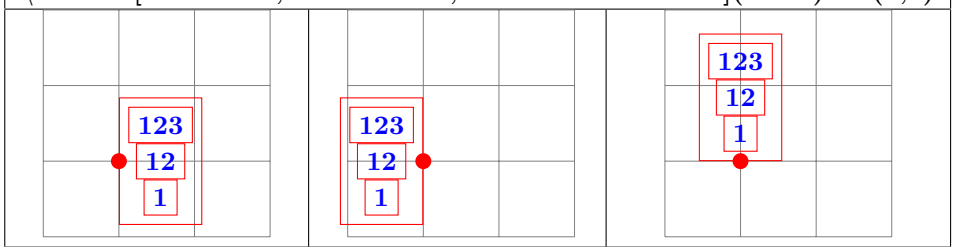
\tikz [matrix of nodes/.style={ execute at begin cell=\node\bgroup , execute at end cell=m^2\egroup; }] \matrix [draw,matrix of nodes]
1 m^2 2 m^2 4 m^2 6 m^2 8 m^2 9 m^2

\matrix [raw,matrix of nodes, execute at empty cell=\node{- -};]
1 2 – 4 – 6 – – 9

7.14.3 Points d'ancrage

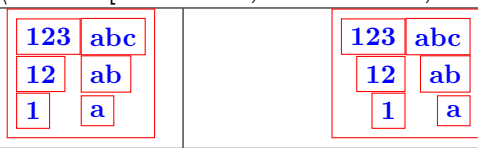
PGFmanual section : 20-4

\matrix [draw=red,nodes=draw,matrix anchor=east](XXX) at (1,1)

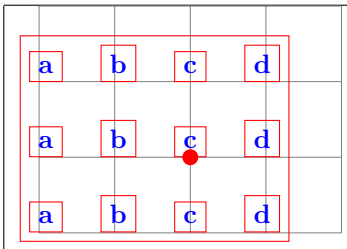


matrix anchor=west | matrix anchor=east | matrix anchor=south

\matrix [draw=red,nodes=draw,anchor=west]



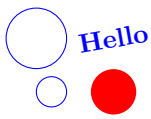
anchor=west | anchor=east




```
\matrix[draw=red,nodes=draw,
matrix anchor=inner node.south, anchor=base,
row sep=5mm,column sep=5mm] at (2,1)
{
\node {a}; & \node {b}; & \node {c}; & \node {d}; \\
\node {a}; & \node {b}; & \node(inner node){c}; & \node
{d}; \\
\node{a}; & \node {b}; & \node{c}; & \node {d}; \\
};
```

7.14.4 Changement du séparateur

PGFmanual section : 20-5




```
\tikz \matrix [ampersand replacement=\| ]
{
\draw (0,0) circle (4mm); \|  \node[rotate=10] {Hello}; \\
\draw (0.2,0) circle (2mm); \|  \fill[red] (0,0) circle (3mm); \\
};
```

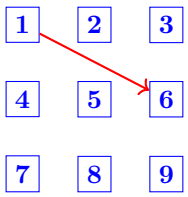
7.15 Matrice de nœuds (compléments)

Charger l'extension: \usetikzlibrary{matrix}

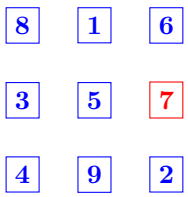
PGFmanual section : 57-1

1 2 3
4 5 6
7 8 9

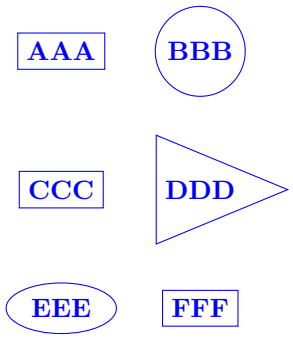
```
\begin{tikzpicture}
\matrix [matrix of nodes]
{
1   &   2   &   3   \\
4   &   5   &   6   \\
7   &   8   &   9   \\
};
\end{tikzpicture}
```



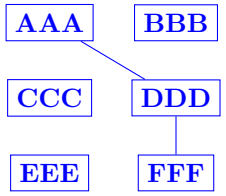

```
\begin{tikzpicture}
\matrix (XXX) [matrix of nodes,column sep=.5cm,row
sep=.5cm,every node/.style=draw]
{
1   &   2   &   3   \\
4   &   5   &   6   \\
7   &   8   &   9   \\
};
\draw[thick,red,->] (XXX-1-1) - - (XXX-2-3) ;
\end{tikzpicture}
```



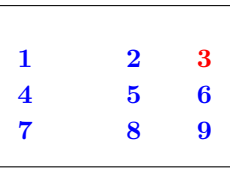

```
1 & 2 &     3     \\
4 & 5 & |[red]| 6 \\
7 & 8 &     9     \\
```



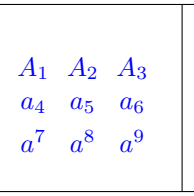

```
    AAA      &        |[circle]| BBB        \\
    CCC      &  |[isosceles triangle]| DDD  \\
|[ellipse]| EEE  &            FFF           \\
```



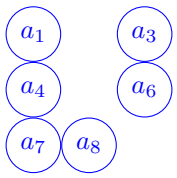

```
\matrix [matrix of nodes,column sep=.5cm,row
sep=.5cm,every node/.style=draw]
{
                |(a)| AAA  &  |(b)| BBB  \\
                |(c)| CCC  &  |(d)| DDD  \\
                |(e)| EEE  &  |(f)| FFF  \\
};
\draw (a) - - (d);
\draw (d) - - (f);
```



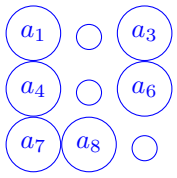

```
1 & [1cm ] 2 & [5mm ] |[red]| 3 \\
4 &     5   &         6         \\
7 &     8   &         9         \\
```




```
\matrix [matrix of math nodes]
{
A_1   &   A_2   &   A_3   \\
a_4   &   a_5   &   a_6   \\
a^7   &   a^8   &   a^9   \\
};
```



```
\matrix [matrix of math nodes,nodes=circle,draw]
{
A__1   &          &   A__3   \\
a__4   &          &   a__6   \\
a__ 7  &   a__ 8  &          \\
};
```



```
\matrix [matrix of math nodes,nodes=circle,draw ,nodes
in empty cells]
{
A__1   &          &   A__3   \\
a__4   &          &   a__6   \\
a__ 7  &   a__ 8  &          \\
};
```

7.15.1 Texte dans les nœuds

PGFmanual section : 57-2

aaa	bbb
ccc	
eee	fff

```
\matrix [matrix of nodes,nodes={text width=2cm,draw}
]
{
aaa & bbb \\
ccc \\
eee & fff \\
};
```

1	aaa bbb ccc
2	ddd

```
\matrix [matrix of nodes,nodes={text width=2cm,draw}
]
{
1 & & {aaa \\ bbb \\ ccc }  \\
2 & & ddd \\
};
```

7.15.2 Délimiteurs

PGFmanual section : 57-3

\matrix [matrix of math nodes,left delimiter=( ]

$\begin{pmatrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{pmatrix}$	$\begin{Bmatrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{Bmatrix}$	$\overline{\begin{matrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{matrix}}$	$\underbrace{\begin{matrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_7 & a_8 & a_9 \end{matrix}}$
left delimiter=(	right delimiter=\}	above delimiter=|	below delimiter=\rmoustache

```
\tikz \node [fill=red!20,text width=2cm,left delimiter=\{ ]
{Ceci est une démonstration d'un texte sur une largeur de 2cm.};
```

Ceci est une démonstration d'un texte sur une largeur de 2cm.

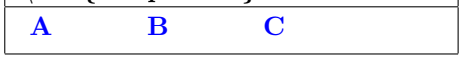
7.16 Matrice de nœuds

7.16.1 Création d'une chaine de nœeuds

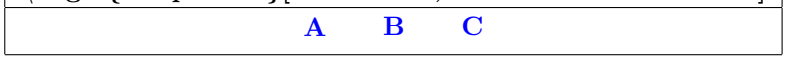
Charger l'extension: \usetikzlibrary{chains}

PGFmanual section : 46-2

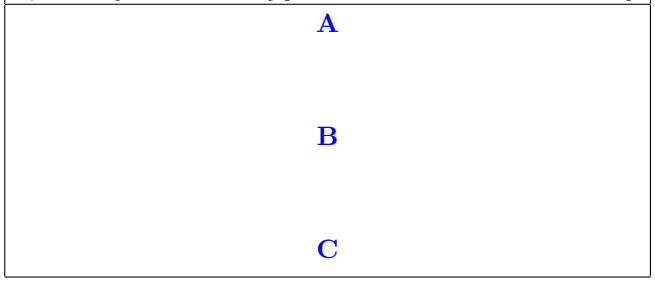
```
\begin{tikzpicture}[start chain]
\node [on chain] {A};
\node [on chain] {B};
\node [on chain] {C};
\end{tikzpicture}
```



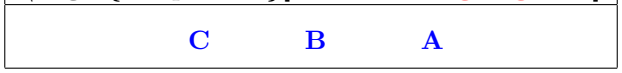

```
\begin{tikzpicture}[start chain, node distance= 0.5 cm]
```



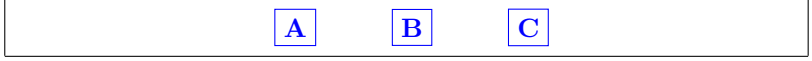

```
\begin{tikzpicture}[start chain=going below ]
```

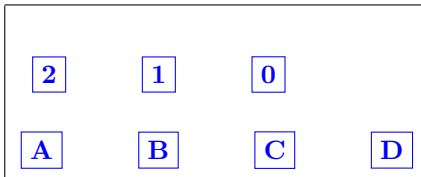



```
\begin{tikzpicture}[start chain=going left ]
```

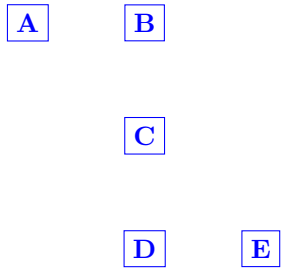



```
\begin{tikzpicture}[start chain, every node/.style=draw ]
```

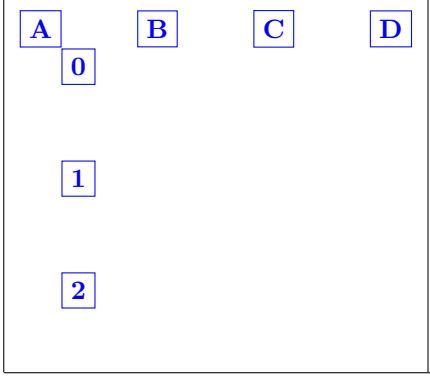





```
\begin{tikzpicture}[start chain=1 going right ,
start chain=2 going left]
\node [draw,on chain=1] {A};
\node [draw,on chain=1] {B};
\node[draw,on chain=1] {C};
\node [draw,on chain=2] at (3,1) {0};
\node [draw,on chain=2] {1};
\node [draw,on chain=2] {2};
\node[draw,on chain=1] {D};
\end{tikzpicture}
```



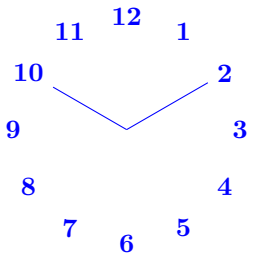

```
\begin{tikzpicture}[start chain going right] \node [draw,on
chain] {A};
\node [draw,on chain] {B};
\node [draw,continue chain=going below,on chain] {C};
\node[draw,on chain] {D};
\node [draw,continue chain=going right,on chain] {E};
\end{tikzpicture}
```



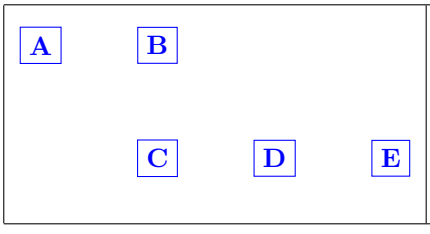

```
\begin{tikzpicture}[start chain going right]
{ [start chain=1]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
\node [draw,on chain] {C};
}
{ [start chain=2]
\node[draw,on chain=2] {0};
\node[draw,on chain=2] {1};
\node[draw,on chain=2] {2};
}
{ [continue chain=1]
\node [draw,on chain] {D};
}
\end{tikzpicture}
```

7.16.2 Nœuds sur la chaine

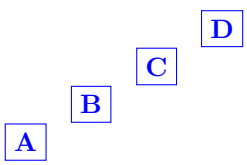
PGFmanual section : 46-3



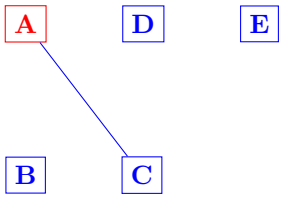

```
\begin{tikzpicture}[start chain=XXX placed
{at=(\tikzchaincount*-30+90:1.5)}]
\foreach \i in {1,...,12}
\node [on chain] {\i};
\draw (0,0) – (XXX-10);
\draw (0,0) – (XXX-2);
\end{tikzpicture}
```



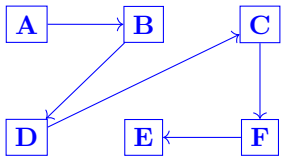

```
\begin{tikzpicture}[start chain]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
\node [draw,on chain=going below] {C};
\node [draw,on chain] {D};
\node [draw,on chain] {E};
\end{tikzpicture}
```




```
\begin{tikzpicture}[start chain=going
{at=(\tikzchainprevious,shift=(30:1)}]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
\node [draw,on chain] {C};
\node [draw,on chain] {D};
\end{tikzpicture}
```




```
\begin{tikzpicture}
\node [draw,red] (A) at (0,2) {A};
{ [start chain]
\node [draw,on chain] {B};
\node [draw,on chain] {C};
\chainin (A) [join];
\node [draw,on chain] {D};
\node [draw,on chain] {E};
}
\end{tikzpicture}
```



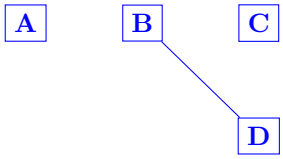

```
\begin{tikzpicture}
\matrix [matrix of nodes,column sep=5mm,row sep=5mm] ,ev-
ery node/.style=draw
{
|(a) | A & |(b) | B & |(c) | C \\
|(d) | D & |(e) | E & |(f) | F \\
};
{ [start chain,every on chain/.style={join=by ->}]
\chainin (a); \chainin(b); \chainin(d);
\chainin (c); \chainin(f); \chainin(e); } \end{tikzpicture}
```

7.16.3 Jonction de nœuds

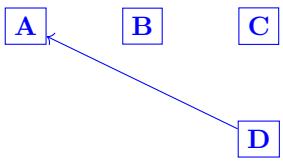
PGFmanual section : 46-4


```
\begin{tikzpicture}[start chain]
\node [draw,on chain] {A};
\node [draw,on chain,join] {B};
\node [draw,on chain] {C};
\node [draw,on chain,join] {D};
\end{tikzpicture}
```


```
\begin{tikzpicture}[start chain, every on chain/.style=join,
every join/.style=->]
\node [draw,on chain] {A};
\node [draw,on chain,join] {B};
\node [draw,on chain] {C};
\node [draw,on chain,join] {D};
\end{tikzpicture}
```



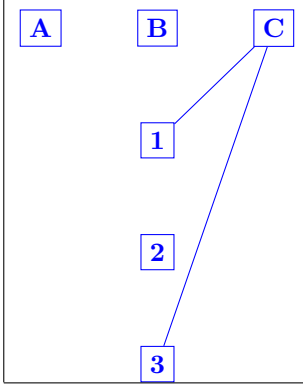

```
\begin{tikzpicture}[start chain]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
\node [draw,on chain] {C};
\node [draw,on chain=going below,join=with chain-2 ] {D};
\end{tikzpicture}
```




```
\begin{tikzpicture}[start chain]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
\node [draw,on chain] {C};
\node [draw,on chain=going below,join=with chain-1 by {blue,<-} ]
{D};
\end{tikzpicture}
```

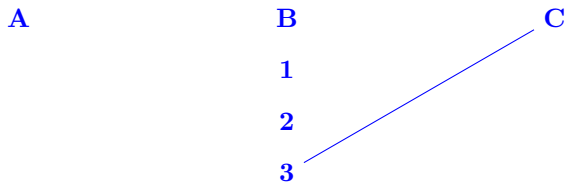
7.16.4 Branches

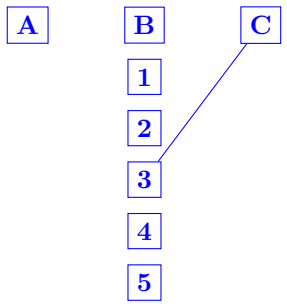
PGFmanual section : 46-5



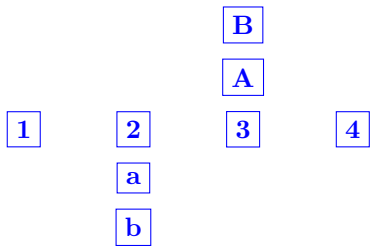

```
\begin{tikzpicture}
{ [start chain=XXX]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
{ [start branch=YYY going below]
\node [draw,on chain] {1};
\node [draw,on chain] {2};
\node [draw,on chain] {3};
}
\node [ draw,on chain,join=with XXX/YYY-end,
join=with XXX/YYY-2] {C};
}
\end{tikzpicture}
```

```
\begin{tikzpicture}[ node distance=.2cm and 3cm]
```





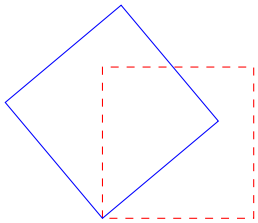
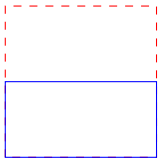
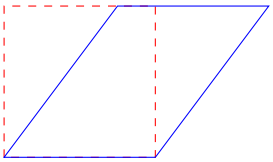
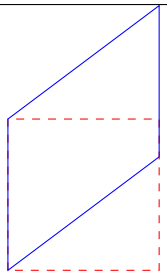
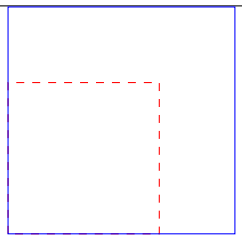
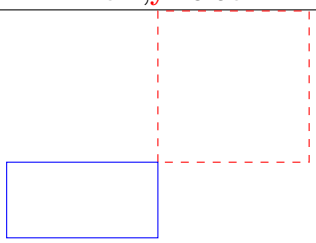
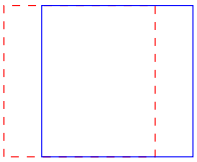
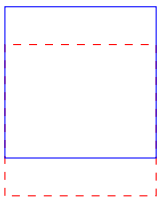

```
\begin{tikzpicture}[ node distance=2mm and 1cm]
{ [start chain=XXX]
\node [draw,on chain] {A};
\node [draw,on chain] {B};
{ [start branch=YYY going below]
\node [draw,on chain] {1};
\node [draw,on chain] {2};
\node [draw,on chain] {3}; }
\node [draw,on chain,join=with XXX/YYY-end] {C};
{ [continue branch=YYY]
\node [on chain] {4};
\node [on chain] {5}; }
}
\end{tikzpicture}
```




```
\begin{tikzpicture}[node distance=2mm and 1cm, every
node/.style=draw]
{ [start chain]
\node [on chain] {1};
\node [on chain] {2};
{ [start branch=XXX going below] }
\node [on chain] {3};
{ [start branch=YYY going above] }
\node [on chain] {4};
{ [continue branch=XXX ]
\node [on chain] {a};
\node [on chain] {b};}
{ [continue branch=YYY ]
\node [on chain] {A};
\node [on chain] {B}; }
```

8 Constructions particulières

PGFmanual section : 25-3

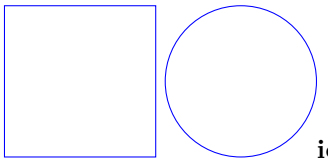
\draw[rotate,blue] (0,0) rectangle (2,2) ;			
			
rotate=40	x=1cm,y=0.5cm	xslant=0.75	yslant=0.75
			
scale=1.5	scale=-1	xshift=0.5cm	yshift=0.5cm

9 Placer son dessin

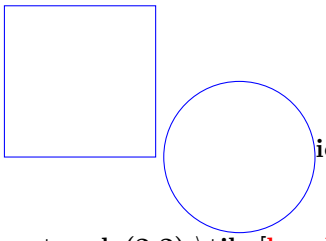
9.1 Dans le texte

9.1.1 Sans option de décalage

PGFmanual section : 12-2

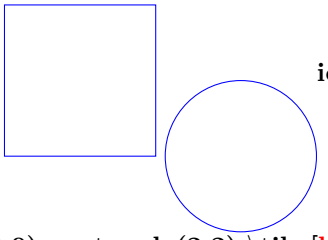
dessin directement dans le texte  ici est inclus le code suivant : \tikz \draw (0,0) rectangle(2,2);\tikz \draw (0,0) circle (1);

9.1.2 Avec décalage nul

dessin directement dans le texte  ici est inclus le code suivant :

\tikz[baseline=0pt] \draw (0,0) rectangle(2,2);\tikz[baseline=0pt] \draw (0,0) circle (1);

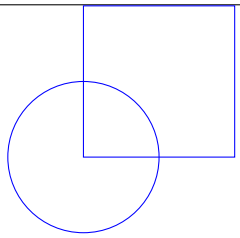
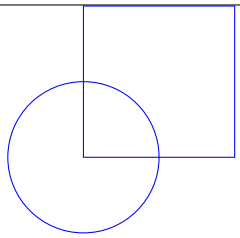
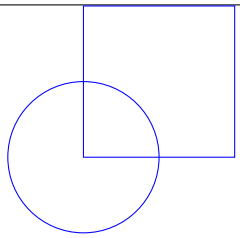
9.1.3 Avec décalage

dessin directement dans le texte  ici est inclus le code suivant

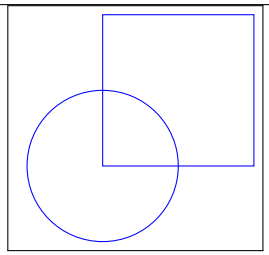
: \tikz[baseline=1cm] \draw (0,0) rectangle(2,2);\tikz[baseline=1cm] \draw (0,0) circle (1);

9.2 Dans un environnement tikzpicture

PGFmanual section : 12-1

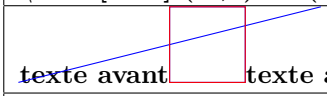
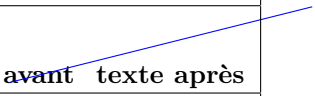
texte avant  texte après	texte avant \begin{tikzpicture}[blue] \draw (0,0) rectangle(2,2); \draw (0,0) circle (1); \end{tikzpicture} texte après
texte avant  texte après	texte avant \begin{tikzpicture}[blue,baseline=0pt] \draw (0,0) rectangle(2,2); \draw (0,0) circle (1); \end{tikzpicture} texte après
texte avant  texte après	texte avant \begin{tikzpicture}[blue,baseline=1cm] \draw (0,0) rectangle(2,2); \draw (0,0) circle (1); \end{tikzpicture} texte après

9.3 Dans un environnement fbox

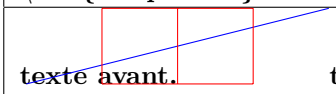
texte avant  texte après	texte avant
	\fbox{
	\begin{tikzpicture}[blue,baseline=0pt]
	\draw (0,0) rectangle(2,2);
	\draw (0,0) circle (1);
	\end{tikzpicture}
	}
	texte après

9.4 Modification du cadrage

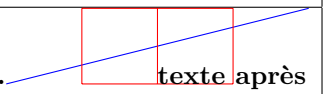
PGFmanual section : 15-8

\draw [use as bounding box] (1,0) rectangle (2,1); \draw[blue] (-1,0) - - (3,1);	
 texte avant texte après	 texte avant texte après
(1,0) rectangle (2,1)	(0,0) rectangle (0,0)

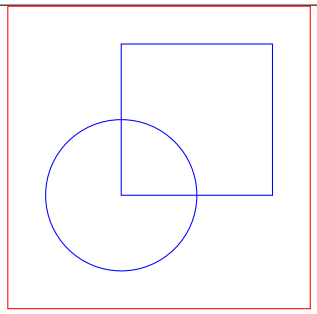
```
texte avant. \begin{tikzpicture} [trim left=1cm]
\draw[blue] (-1,0) - - (3,1); \draw[red] (0,0) grid (2,1);
\end{tikzpicture}texte après
```

texte avant.  texte après

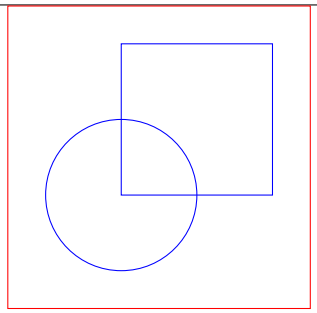
[trim left=1cm]

texte avant.  texte après

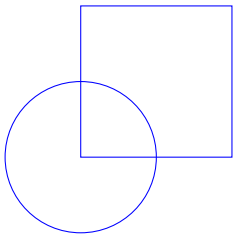
[trim right= 1cm]

texte avant  texte après

```
texte avant
\begin{tikzpicture}[blue]
\draw [red,use as bounding box] (-1.5,-1.5) rectangle
(2.5,2.5);
\draw (0,0) rectangle(2,2);
\draw (0,0) circle (1);
\end{tikzpicture}
texte après
```

texte avant  texte après

```
texte avant
\begin{tikzpicture}[blue,baseline=0pt]
\draw [red,use as bounding box] (-1.5,-1.5) rectangle
(2.5,2.5);
\draw (0,0) rectangle(2,2);
\draw (0,0) circle (1);
\end{tikzpicture}
texte après
```

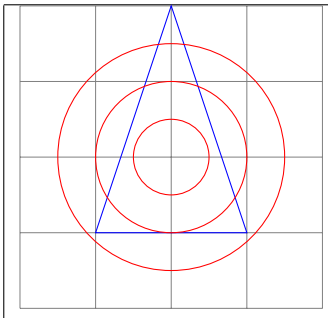
texte avant  texte après

```
texte avant
\begin{tikzpicture}[blue,baseline=0pt]
\useasboundingbox (-1.5,-1.5) rectangle (2.5,2.5);
\draw (0,0) rectangle(2,2);
\draw (0,0) circle (1);
\end{tikzpicture}
texte après
```

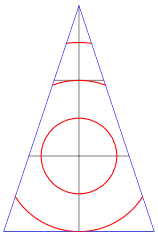
```
\begin{tikzpicture}[blue]
\fill (0,0) circle (5pt);
\fill (2,1) circle (5pt);
\draw[red] (current bounding box.south west) rectangle (current bounding
box.north east);
\end{tikzpicture}
```

9.5 Coupure de l'image

PGFmanual section : 15-9

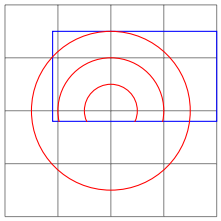


sans coupure



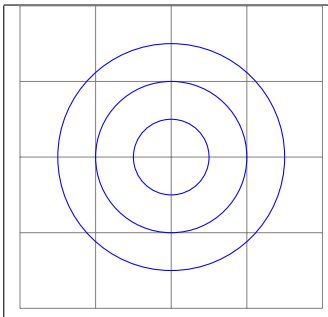
```
\clip (-1,-1) - -(0,2) - - (1,-1) - - cycle;
```

9.6 Rognage partiel

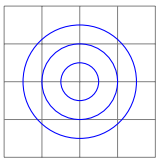


```
\tikzpicture[red,scale=.7]
\draw[help lines] (-2,-2) grid (2,2);
\draw[blue] (-1.1,-0.2) rectangle (2,1.5);
\draw (0,0) circle (1.5);
\clip (-1.1,-0.2) rectangle (2,1.5);
\draw (0,0) circle (.5);
\draw (0,0) circle (1);
\endtikzpicture
```

9.6.1 Changement d'échelle



Taille normale



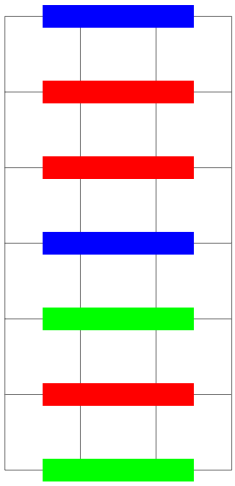
```
\tikzpicture[blue,scale=.5]
```

10 Scope

10.1 Environnement Scope

PGFmanual section : 12-3

```
\begin{tikzpicture}[line width = 3mm]

\draw (0.5,6) - - (2.5,6);

\begin{scope}[red]
\draw (0.5,5) - - (2.5,5);
\draw (0.5,4) - - (2.5,4);
\end{scope}

\draw (0.5,3) - - (2.5,3);

\begin{scope}[green]
\draw (0.5,2) - - (2.5,2);
\draw [red] (0.5,1) - - (2.5,1);
\draw (0.5,0) - - (2.5,0);
\end{scope}

\end{tikzpicture}
```



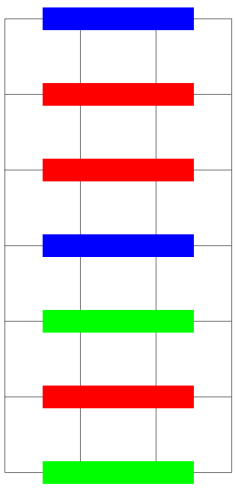
10.2 library scopes

10.2.1 Simplification d'un environnement scope

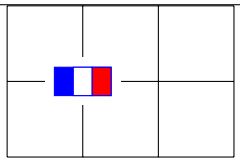
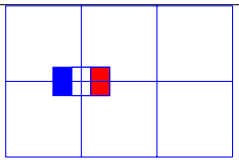
PGFmanual section : 12-3-2

Charger l'extension: \usetikzlibrary{scopes}

```
\begin{tikzpicture}[line width = 3mm]

\draw (0.5,6) - - (2.5,6);

{ [red]
\draw (0.5,5) - - (2.5,5);
\draw (0.5,4) - - (2.5,4);
}

\draw (0.5,3) - - (2.5,3);

{ [green]
\draw (0.5,2) - - (2.5,2);
\draw [red] (0.5,1) - - (2.5,1);
\draw (0.5,0) - - (2.5,0);
}

\end{tikzpicture}
```



10.2.2 Portée d'un seul élément

	
\node [fill=white] at (1,1) {\DFR}; \scoped [on background layer] \draw (0,0) grid (3,2);	\node [fill=white] at (1,1) {\DFR}; \draw (0,0) grid (3,2);

11 Position absolue sur une page

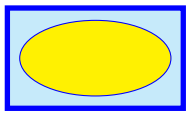
```
\begin{tikzpicture}[remember picture,overlay]
\fill(current page.north) circle (5pt) node[below left=4mm] \Huge north ;
\fill(current page.north east) circle (5pt) node[below left=4mm] \Huge north east ;
\fill(current page.north west) circle (5pt) node[below right=4mm] \Huge north west ;
\fill(current page.east) circle (5pt) node[above left=4mm] \Huge east ;
\fill(current page.center) circle (5pt) node[above left=4mm] \Hugecenter ;
\fill(current page.west) circle (5pt) node[above right=4mm] \Huge west ;
\fill(current page.south) circle (5pt) node[above right=4mm] \Huge south ;
\fill(current page.south west) circle (5pt) node[above right=4mm] \Huge south west ;
\fill(current page.south east) circle (5pt) node[above left=4mm] \Huge south east ;
\end{tikzpicture}
```

```
\begin{tikzpicture}[remember picture,overlay]
\node [opacity=.15] at (current page.center) {\includegraphics[width=8cm]{tiger} };
\end{tikzpicture}
```

```
\begin{tikzpicture}[remember picture,overlay]
\draw[dotted,opacity=.4] (current page.south west) - - (current page.north east)
      node[near start] {\Huge TIKZ} ;
\end{tikzpicture}
```

12 Arrière plan du dessin

12.1 Encadrement

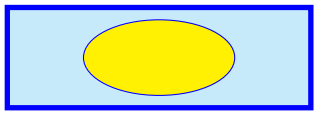


[1]

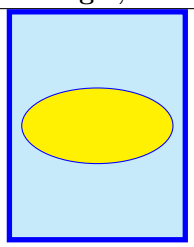
```
\begin{tikzpicture}[show background rectangle]
\filldraw[fill=yellow] (0,0) ellipse (1 and .5 );
\end{tikzpicture}

Autre syntaxe :
\begin{tikzpicture}[framed]
```

12.1.1 Options

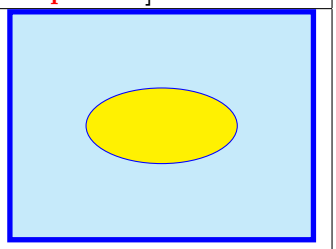
[show background rectangle,inner frame xsep=1cm]



inner frame xsep=1cm

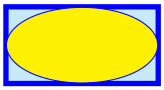


inner frame ysep=1cm



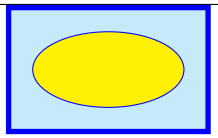
inner frame sep=1cm

Par défaut : : inner frame xsep=1ex , inner frame ysep=1ex



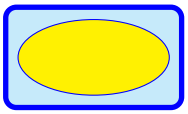
tight background

(inner frame sep = 0pt)



loose background

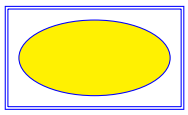
(inner frame sep = 2ex)



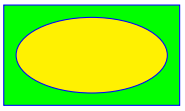
rounded corners

12.1.2 Style

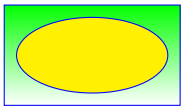
[background rectangle/.style={double,draw=blue},framed]



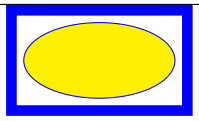
double



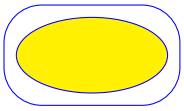
fill=green



top color=green

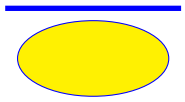


line width=4pt

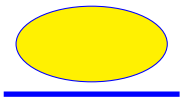


rounded corners=0.5cm

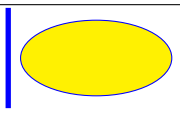
12.2 Encadrement partiel



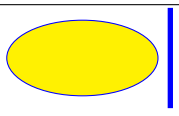
show background top



show background bottom



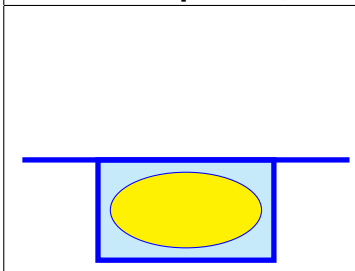
show background left



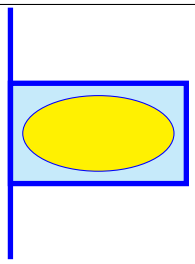
show background right

[1] \tikzset{background rectangle/.style={fill=cyan!20,draw=blue,line width=2pt}}

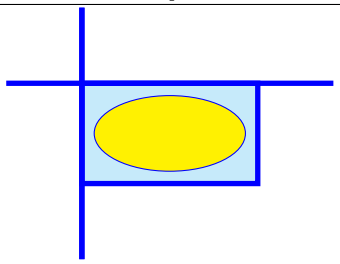
[framed,show background top,outer frame xsep=1cm]



outer frame xsep=1cm



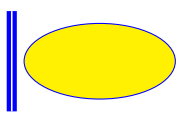
outer frame ysep=1cm



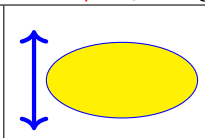
outer frame sep=1cm

12.2.1 Style

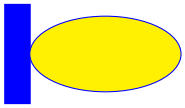
```
\begin{tikzpicture}[show background left,
    [background left/.style={double,ultra thick,draw=blue}]
```



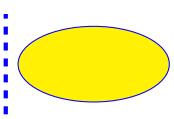
double



<->

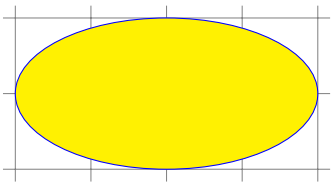


line width=10pt



dashed

12.2.2 Quadrillage



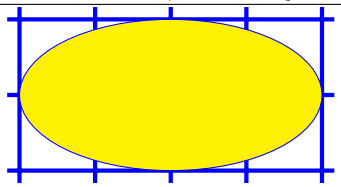
```
\begin{tikzpicture}[show background grid]
\filldraw[fill=yellow] (0,0) ellipse (2 and 1);
\end{tikzpicture}
```

Autre syntaxe :

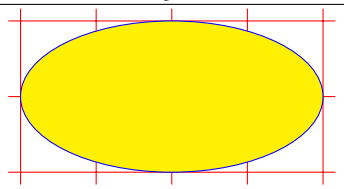
```
\begin{tikzpicture}[gridded]
```

12.2.3 Style

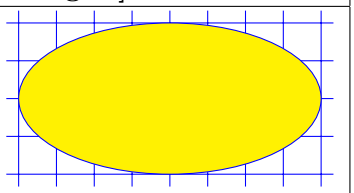
[background grid/.style={ultra thick,draw=blue},show background grid]



ultra thick ,draw=blue,draw=blue

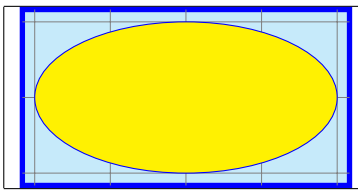


draw=red



step=.5cm,draw=blue

12.2.4 Encadrement et quadrillage



```
\begin{tikzpicture}[framed , gridded ]
\filldraw[fill=yellow] (0,0) ellipse (2 and 1);
\end{tikzpicture}
```

13 Créer ses couleurs

13.1 Couleurs de base

black	blue	brown	cyan	darkgray
gray	green	lightgray	lime	magenta
olive	orange	pink	purple	red
teal	violet	white	yellow	

[blue!10]	[blue!30]	[blue!50]	[blue!70]	[blue!90]

13.2 Mélange de couleurs

[blue!30!red]	[red!80!blue!20]	[red!80!blue!50]	[red!80!blue!50!black!40]

13.3 Créer son nom de couleur

PGFmanual section : 15-2

13.3.1 A pourcentage de rouge vert et bleue

```
\definecolor{macouleur}{rgb}{.75,0.5,0.25}
(75% de rouge 50% de vert 25% de bleu)
\fill [macouleur] (0,0) rectangle (2,1);
```

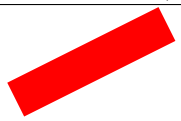
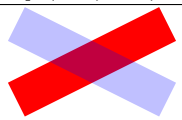
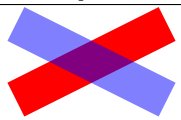
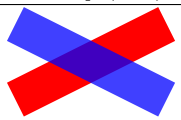
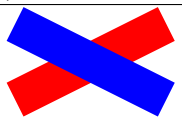
13.3.2 A partir d'une couleur existante

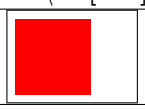
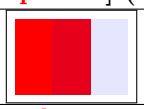
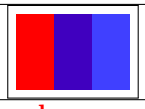
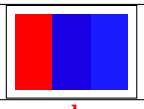
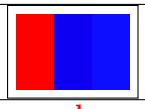
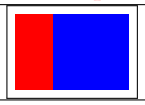
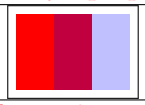
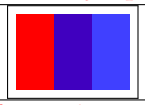
```
\colorlet{monrouge}{red!25}
\fill [monrouge] (0,0) rectangle (2,1);
```

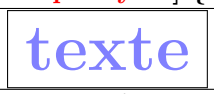
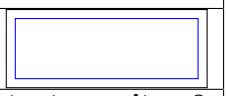
```
\colorlet{monviolet}{red!25!blue}
\fill [monviolet] (0,0) rectangle (2,1);
```

14 Opacité

PGFmanual section : 23-2

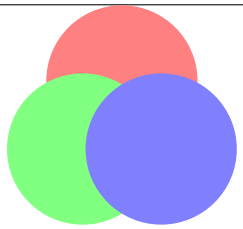
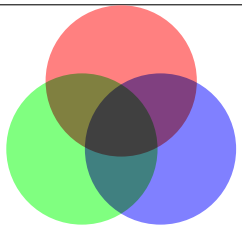
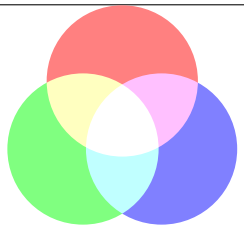
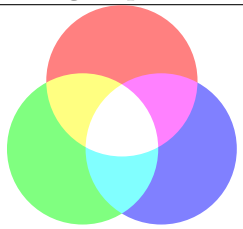
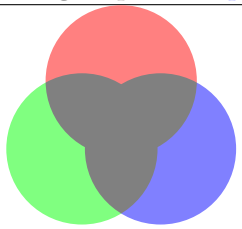
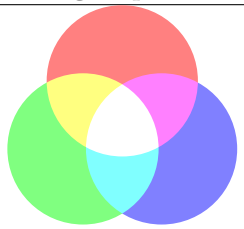
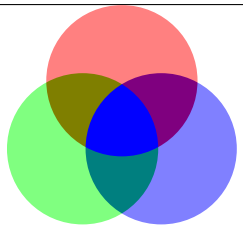
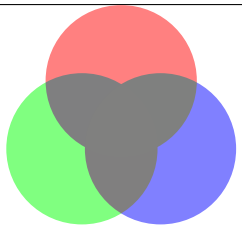
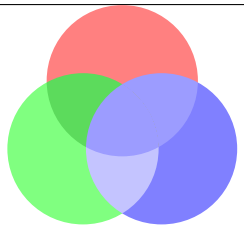
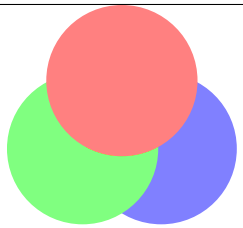
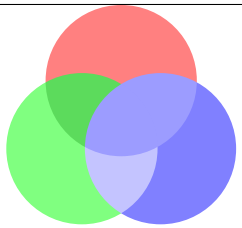
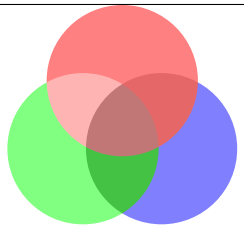
\draw[red] (0,0) – (2,1); \draw [blue,draw opacity=0] (0,1) - - (2,0);				
				
draw opacity=0	draw opacity=0.25	draw opacity=0.5	draw opacity=0.75	draw opacity=1

\fill[red] (0,0) rectangle (1,1); \fill[blue,transparent] (0.5,0) rectangle (1.5,1);			
			
transparent	ultra nearly transparent	very nearly transparent	nearly transparent
			
semitransparent	nearly opaque	very nearly opaque	ultra nearly opaque
			
opaque	fill opacity=.25	fill opacity=.5	fill opacity=.75

\node at (1,1) [text opacity=1] { \Huge texte} ;				
				
text opacity=1	text opacity=0.75	text opacity=0.5	opacity=0.25	text opacity=0

14.1 Blend Modes

PGFmanual section : 23-3

		
blend group=normal	blend group=multiply	blend group=screen
		
blend group=overlay	blend group=darken	blend group=lighten
		
blend group=difference	blend group=exclusion	blend group=hue
		
blend group=saturation	blend group=color	blend group=luminosity

A revoir message d'erreur Unknow blend mode !			
blend group=colordodge	blend group=colorburn	blend group=hardlight	blend group=softlight

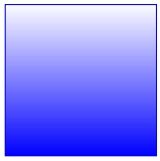
14.2 Fading

Charger l'extension: \usetikzlibrary{fadings}

14.2.1 Modèles prédéfinis

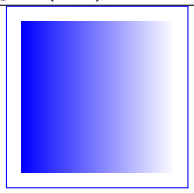
PGFmanual section : 51

\fill [blue,path fading=north] (-1,-1) rectangle (1,1);

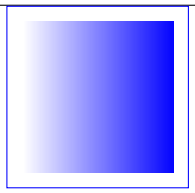


path fading=north

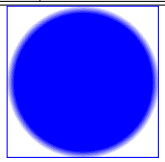
path fading=south



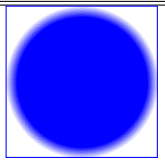
path fading=east



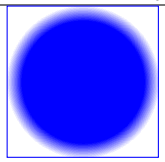
path fading=west



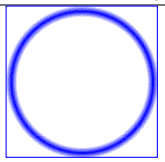
path fading=circle with fuzzy edge 10 percent



path fading=circle with fuzzy edge 15 percent



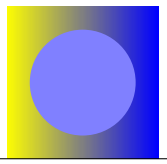
path fading=circle with fuzzy edge 20 percent

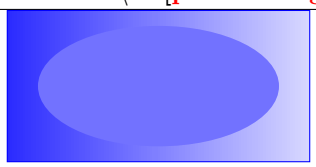
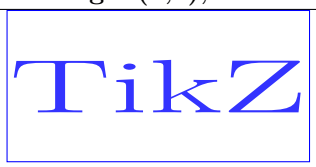
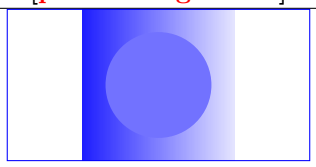
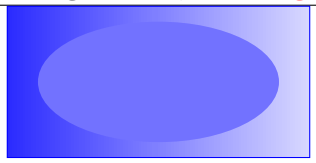
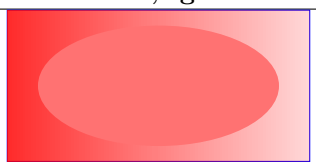
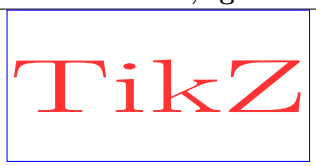


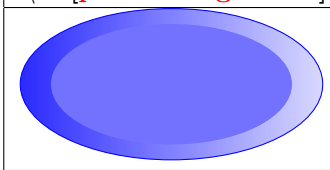
path fading=fuzzy ring 15 percent

14.2.2 Création de décoloration avec tikzfadingfrompicture

PGFmanual section : 23-4-1

Création	*Visualisation*
\begin{tikzfadingfrompicture}[name=filtre] \shade[left color=yellow,right color=blue!100] (0,0) rectangle (2,2); \fill[blue!50] (1,1) circle (0.7); \end{tikzfadingfrompicture}	
\begin{tikzfadingfrompicture}[name=tikz] \node [draw,text=transparent!20] {\fontfamily{ptm}\fontsize{25}{25}\bfseries\selectfont TikZ}; \end{tikzfadingfrompicture}	

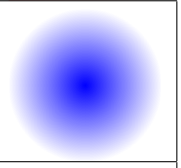
Utilisation dans un rectangle	
\fill[path fading=filtre] (-2,-1) rectangle (2,1);	
	
[path fading=filtre]	[path fading=tikz]
	
[path fading=filtre ,fit fading=false]	[path fading=tikz,fit fading=false]
	
left color=blue,right color=red	[path left color=blue,right color=red
	
[path fading=filtre ,red]	[path fading=tikz,red]

Utilisation dans un ellipse	
\fill[path fading=filtre] (-2,-1) ellipse (2 and 1);	
	
[path fading=filtre]	[path fading=tikz]

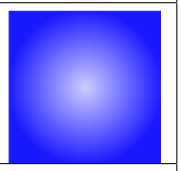
14.3 Création de décoloration avec tikzfading

```
\tikzfading[name=fade right, left color=transparent!0, right color=transparent!100]

\tikz \filldraw [red,path fading=fade right] (-1,-1) rectangle (1,1);
```

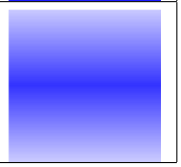
```
\tikzfading[name=fade out, inner color=transparent!0, outer color=transparent!100]

\tikz \filldraw [blue,path fading=fade out] (-1,-1) rectangle (1,1);
```



```
\tikzfading[name=fade inside, inner color=transparent!80, outer color=transparent!10]

\tikz \filldraw [blue,path fading=fade inside] (-1,-1) rectangle (1,1);
```



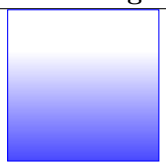
```
\tikzfading[name=middle, top color=transparent!80, bottom color=transparent!80, middle color=transparent!20]

\tikz \filldraw [blue,path fading=middle] (-1,-1) rectangle (1,1);
```



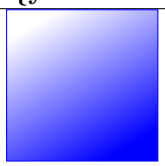
14.3.1 Modification de la décoloration

PGFmanual section : 23-4-2

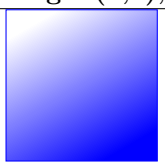
```
\fill [blue,path fading=north,fading transform={yshift=-.5cm}] (-1,-1) rectangle (1,1);
```



fading transform={yshift=-.5cm}



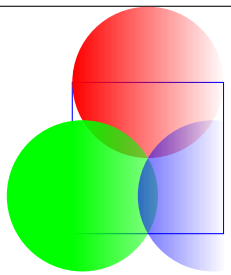
fading transform={yshift=-.5cm}



fading angle=30

PGFmanual section : 23-4-3

```
\begin{tikzpicture}
\draw (-1,-1) rectangle (1,1);
\path [scope fading=east] (-1,-1) rectangle (1,1);
\fill[red] ( 90:1) circle (1);
\fill[green] (210:1) circle (1);
\fill[blue] (330:1) circle (1);
\end{tikzpicture}
```



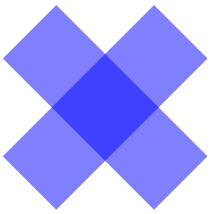
```
\tikz \node [black,scope fading=south,fading angle=45,text width=5cm]
{ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ VisualTIKZ };
```

VisualTIKZ VisualTIKZ
VisualTIKZ VisualTIKZ
VisualTIKZ VisualTIKZ
VisualTIKZ VisualTIKZ
VisualTIKZ VisualTIKZ
VisualTIKZ VisualTIKZ
VisualTIKZ

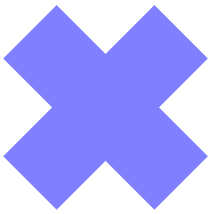
14.4 Transparency Groups

PGFmanual section : 23-5

```
\begin{tikzpicture}[opacity=.5]
\draw [line width=1cm] (0,0) – (2,2);
\draw [line width=1cm] (0,2) – (2,0);
\end{tikzpicture}
```



[opacity=.5]



[opacity=.5,transparency group]

A revoir : ne fonctionne pas

```
\begin{tikzpicture}
\shade [left color=red,right color=blue] (-2,-1) rectangle (2,1);
\begin{scope}[transparency group=knockout]
\fill][white] (-1.9,-.9) rectangle (1.9,.9);
\node [opacity=0] TikZ;
\end{scope}
\end{tikzpicture}
```

15 Créer ses commandes

Charger l'extension: Atention : la création de la commande doit être placée avant \begin{document} !

syntaxe :\newcommand{\nom}[nombre de variables]{Description}

Exemple : commande avec une variable :
Création

```
\newcommand
{\maboite}[1]{                  % commande nommée maboite et 1 seul d'argument
\begin{center}                  % centrage sur la ligne
\tikzpicture \node[fill=yellow  % un nœud de texte de couleur jaune
,text centered                  % centrage du texte dans la boite
,text width=.5\linewidth]       % largeur : la moitié de la ligne
#1} ; \end{center}              % #1 correspond à l'argument
}
```

Utilisation **: \maboite{contenu}**

Charger l'extension: contenu

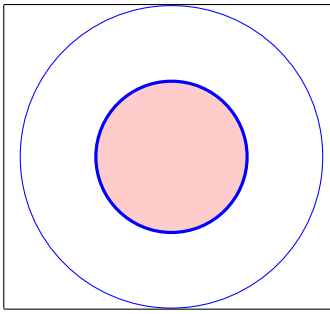
Exemple : commande sans variable :
Création

```
\newcommand{\DFR}{ \tikzpicture[scale=.25] \draw [fill=blue](0,0) rectangle (3,1.5);
\draw [fill=white](1,0) rectangle (2,1.5); \draw[fill=red](2,0) rectangle (3,1.5);\endtikzpicture }
```

Utilisation **: \DFR** 

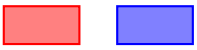
16 Créer ses styles

16.1 Styles sans variable



```
\begin{tikzpicture} [mon style/.style={draw=blue, fill=red!20, very thick}]
\draw (0,0) circle (2cm);
\draw[mon style] (0,0) circle (1cm);
\end{tikzpicture}
```

16.2 Styles avec variable



```
\begin{tikzpicture} [mon style/.style={draw=#1, thick, fill=#1!50, scale=.5}]
\filldraw [mon style=red] (0,0) rectangle (2,1);
\filldraw [mon style=blue] (3,0) rectangle (5,1);
\end{tikzpicture}
```

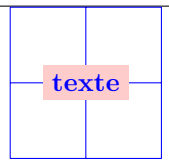
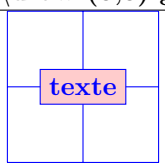
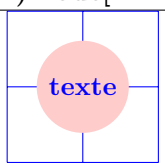
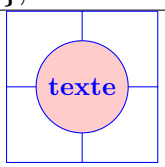
valeur par défaut

```
\begin{tikzpicture} [mon style/.style={draw=#1,fill=#1!20,very thick},
mon style/default=black]
\filldraw [mon style] (0,0) rectangle (2,1);
\filldraw [mon style=blue] (3,0) rectangle (5,1);
\end{tikzpicture}
```

17 Mettre du texte en valeur

17.1 Dans un nœud de Tikz

\tikz \draw (0,0) grid (2,2) (1,1) node[fill=red!20] {texte};

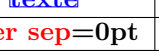
			
node[fill=red!20]	node[fill=red!20,draw]	node[fill=red!20,circle]	node[fill=red!20,circle,draw]

17.1.1 Options

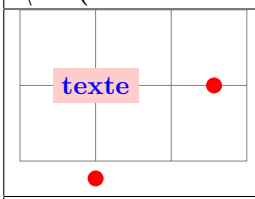
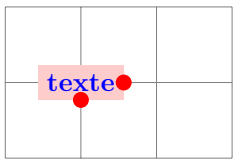
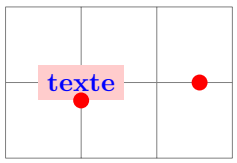
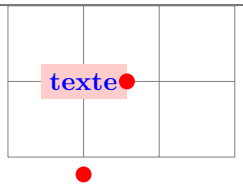
\tikz \draw node[draw,double,blue] {texte};

							
double	rounded corners	ultra thick	dashed	red	rotate=45	shading=radial	text=red

\tikz \draw node[draw,inner sep=0pt] {texte}; PGFmanual section : 17-2-3

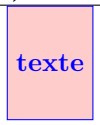
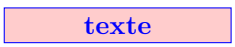
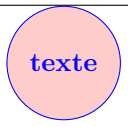
			
inner sep=0pt	inner sep=1cm	inner xsep=1cm	inner ysep=1cm
Par défaut : : 0.3333em			

\node [fill=red!20,outer sep=1cm] (A) at (1,1) {texte}; PGFmanual section : 17-2-3
\fill (node cs:name=A,anchor=east) circle (3pt);
\fill (node cs:name=A,anchor=south) circle (3pt);

			
outer sep=1cm	outer sep=0pt	outer xsep=1cm	outer ysep=1cm
Par défaut : : 0.5\pgflinewidth			

17.1.2 Taille minimale des noeuds

\draw((0,0) node[fill=blue!20,minimum height=1.5cm,draw] {texte} ; PGFmanual section : 17-2-3

	
minimum height=1.5cm	minimum width=3cm
	
minimum size=1.5cm,draw	minimum size=1.5cm,circle

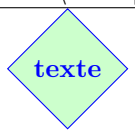
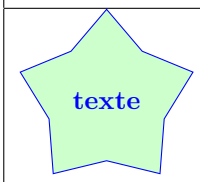
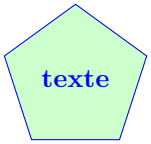
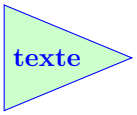
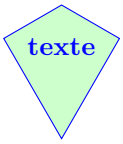
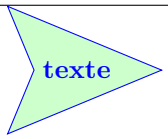
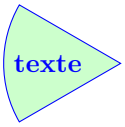
17.2 Dans un nœud à formes géométriques

Charger l'extension: \usetikzlibrary{shapes.geometric}

PGFmanual section : 67-3

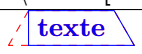
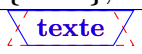
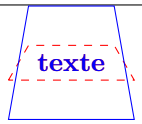
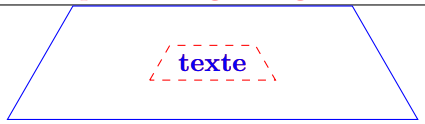
17.2.1 Formes disponibles

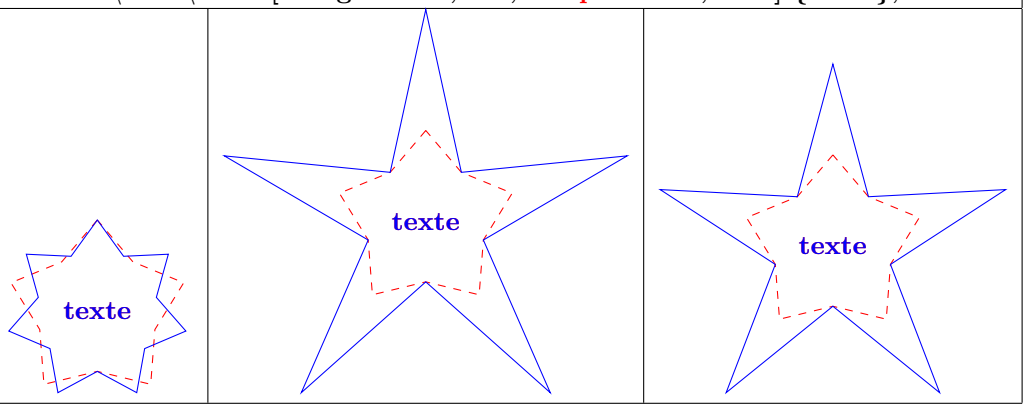
2 syntaxes :
\tikz \node[fill=green!20,shape=diamond,draw,blue] {texte};
\tikz \node[fill=green!20,diamond,draw] {texte};

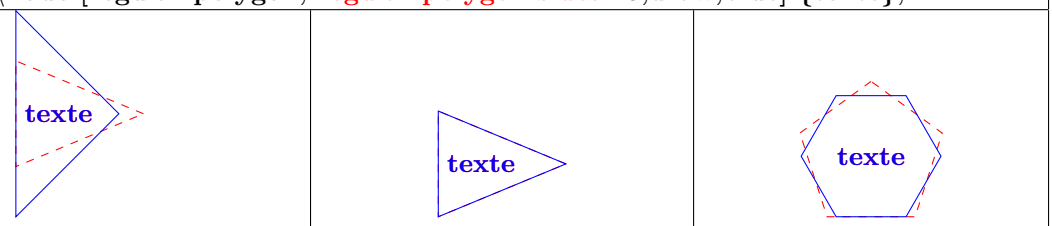
			
diamond	ellipse	trapezium	semicircle
			
star	regular polygon	isosceles triangle	kite
			
dart	circular sector	cylinder	

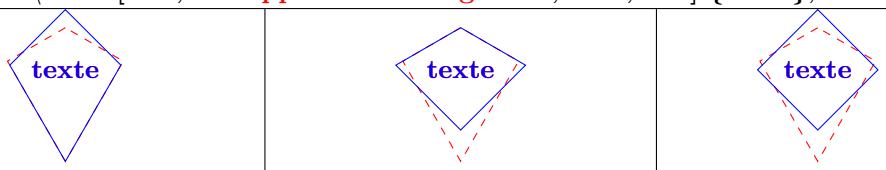
17.2.2 Options

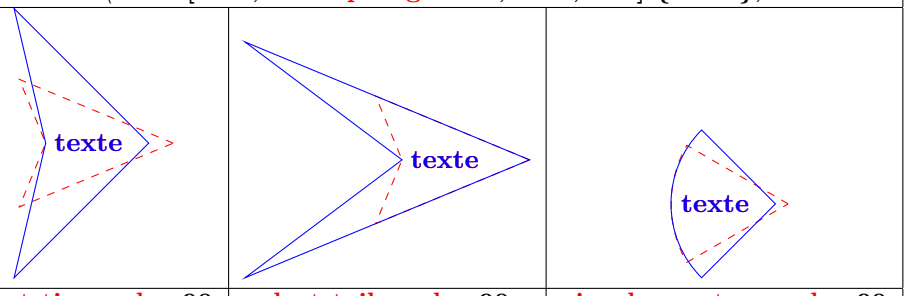
\node [trapezium,draw,trapezium left angle=90,draw,blue] {texte};

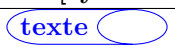
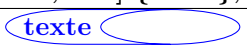
		
trapezium left angle=90	trapezium right angle=90	trapezium angle=120
		
minimum height=1.5cm trapezium stretches=true	minimum height=1.5cm trapezium stretches=false	minimum width=1.5cm trapezium stretches

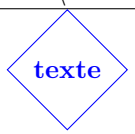
\tikz \node [fill=green!20,star,star points=6,draw] {texte};		
		
star points=7	star point height = 2cm	star point ratio = 3
Par défaut : 5	Par défaut : .5cm	Par défaut : 1.5

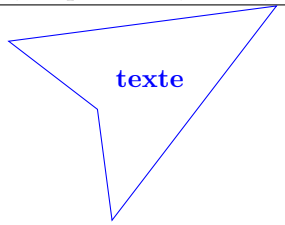
\node [isosceles triangle,isosceles triangle apex angle=90,draw,blue] {texte}; \node [regular polygon, regular polygon sides=6,draw,blue] {texte};		
		
isosceles triangle apex angle=90	isosceles triangle stretches	regular polygon sides=6

\node [kite,kite upper vertex angle=90,draw,blue] {texte};		
		
kite upper vertex angle=90	kite lower vertex angle=90	kite vertex angles=90
initially 120	initially 60	

\node [dart,dart tip angle=90,draw,blue] {texte};		
		
dart tip angle=90	dart tail angle=90	circular sector angle=90
initially 45	initially 135	initially 60

\node [cylinder,aspect=2,draw,blue] {texte};	
	
aspect=2	aspect=4
	
cylinder uses custom fill, cylinder end fill=yellow	cylinder uses custom fill, cylinder body fill=yellow

\draw(0,0) node[shape aspect=1,diamond,draw] {texte} ;			
			
shape aspect=1	shape aspect=2	shape aspect=3	shape aspect=4

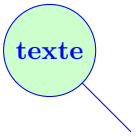
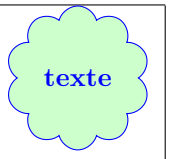
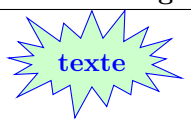
\draw node[shape border rotate=30,shape=dart, draw, shape border uses incircle] {texte};


17.3 Dans un nœud en forme de symboles

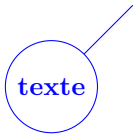
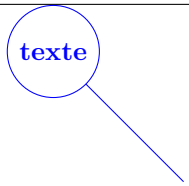
Charger l'extension: \usetikzlibrary{shapes.symbols}

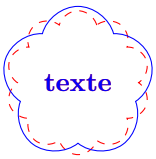
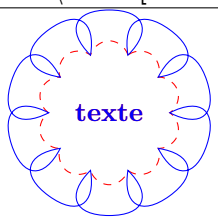
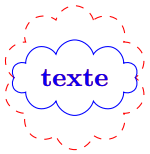
PGFmanual section : 67-4

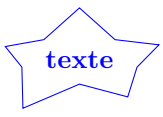
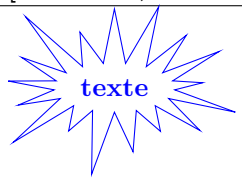
17.3.1 Formes disponibles

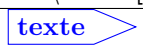
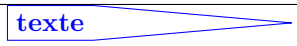
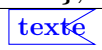
		
forbidden sign	magnifying glass	cloud
		
starburst	signal	tape

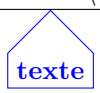
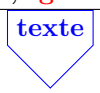
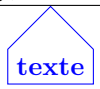
17.3.2 Options

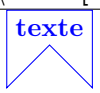
\node[magnifying glass,magnifying glass handle angle=45,draw,blue] {texte} ;		
		
magnifying glass handle angle=45	magnifying glass handle aspect=3	line width=1ex
Par défaut : : -45	Par défaut : : 1.5	

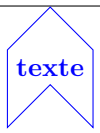
\node [cloud,cloud puffs=5,draw,blue] {texte};			
			
cloud puffs=5	cloud puff arc=270	cloud ignores aspect=false	cloud ignores aspect=true
Par défaut : : 10	Par défaut : : 135	Par défaut : : true	

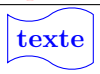
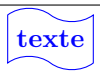
\node [starburst,starburst points=5,draw,blue] {texte};			
			
starburst points=5	starburst point height=1cm	random starburst=50	random starburst=0

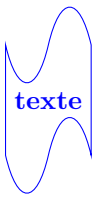
\node [signal,signal pointer angle=45,draw,blue] {texte};		
		
signal pointer angle=45	signal pointer angle=10	signal pointer angle=300
Par défaut : : signal pointer angle= 90		

\node [signal,signal to=above,draw,blue] {texte};			
			
signal to=above	signal to=below	signal to=right	signal to=above

\tikz [signal to=nowhere] \node [signal,signal from=above=45,draw,blue] {texte};			
			
signal from=above	signal from=below	signal from=right	signal from=above

	
signal from=east , signal to=west	signal from=south, signal to=north

\tikz \node [tape, draw,tape bend top=out and in] {texte};		
		
tape bend top=out and in	tape bend bottom=out and in	tape bend bottom=in and in
		
tape bend top=none	tape bend bottom=out and in tape bend top=out and in	tape bend bottom=in and out tape bend top=in and out (Par défaut :)

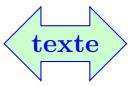
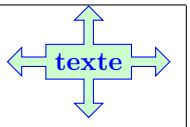
\tikz \node [tape, draw, tape bend height=1cm,blue] {texte};

Par défaut : : tape bend height = 5pt

17.4 Dans un nœud en forme de flèche

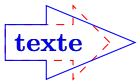
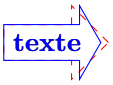
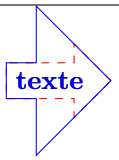
Charger l'extension: \usetikzlibrary{shapes.arrows}

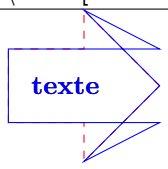
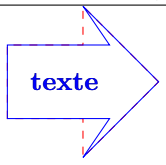
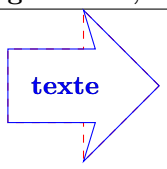
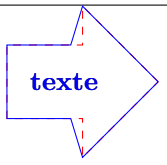
PGFmanual section : 67-5

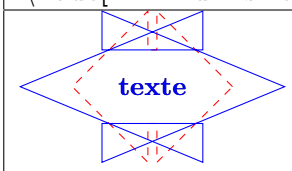
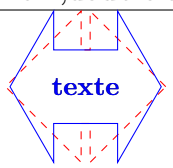
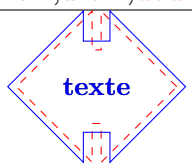
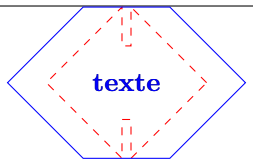
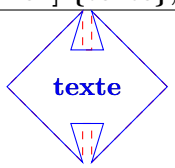
17.4.1 Formes disponibles

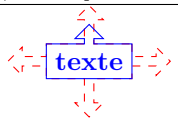
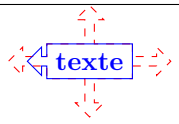
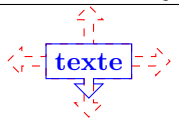
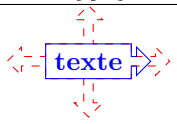
		
single arrow	double arrow	arrow box

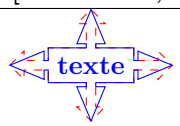
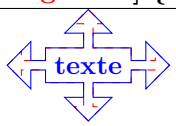
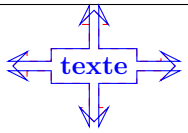
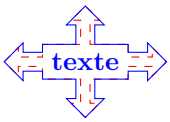
17.4.2 Options

\node[single arrow,draw,single arrow tip angle=45] {texte}; \node[single arrow,draw,single arrow head extend=.75cm] {texte};				
				
angle=45	angle=120	extend=.75cm]	extend=0cm	extend=-1mm
Par défaut : : single arrow tip angle= 90		Par défaut : : single arrow head extend=0.5cm		

\node[minimum size=2cm,single arrow,draw,single arrow head indent=1cm,blue] {texte};			
			
indent=1cm	indent=10pt	indent=1ex	indent=-1ex

\node[minimum size=2cm,double arrow,draw,double arrow tip angle=45] {texte}; \node[minimum size=2cm,double arrow,draw,double arrow head extend=1ex] {texte}; \node[minimum size=2cm,double arrow,draw,double arrow head indent=1ex] {texte};				
				
angle=45	angle=120	extend=1ex	extend=0	indent=1ex

\node [arrow box, draw, arrow box arrows={north:.25cm}] {texte};			
			
{north:.25cm}	{west:.25cm}	{south:.25cm}	{east:.25cm}
Par défaut : : 0.5 cm			

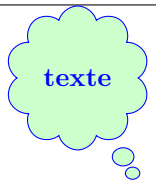
\node [arrow box, draw, arrow box tip angle=45] {texte};	
	
arrow box tip angle=45	arrow box head extend=.25cm
Par défaut : : 90	Par défaut : : 0.125cm
	
arrow box head indent=.25cm	arrow box shaft width=.25cm
Par défaut : : 0cm	Par défaut : : 0.125cm

17.5 Dans un nœud en forme de bulle

Charger l'extension: \usetikzlibrary{shapes.callouts}

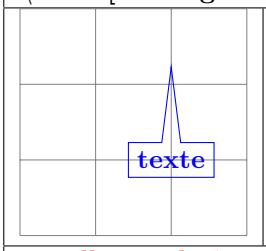
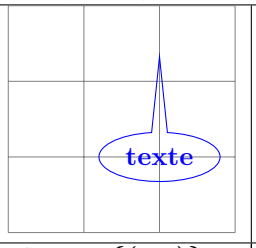
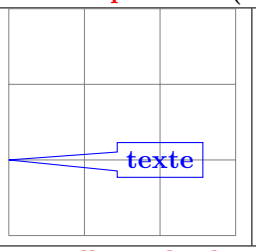
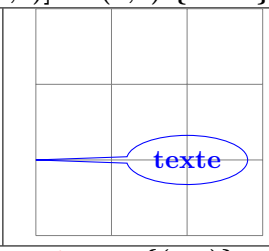
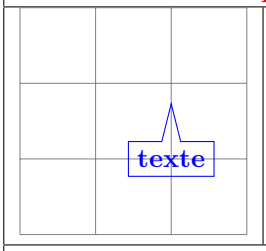
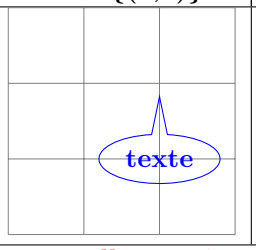
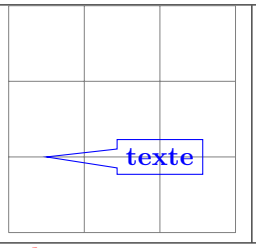
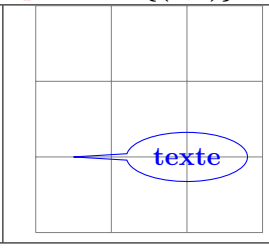
PGFmanual section : 67-7

17.5.1 Formes disponibles

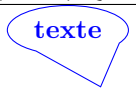
		
ellipse callout	rectangle callout	cloud callout

17.5.2 Options

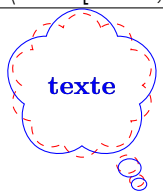
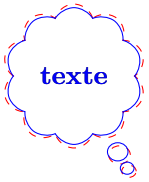
\node [rectangle callout,draw,callout absolute pointer=(0,1)] at (2,1) {texte};

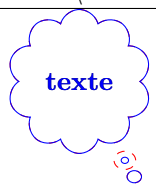
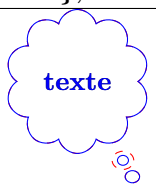
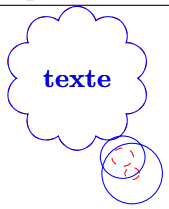
			
callout relative pointer={(0,1)}		callout absolute pointer={(0,1)}	
			
callout pointer shorten=.5cm			

\node [ellipse callout,draw,callout pointer arc=1] at (0,1.5) {texte};

		
callout pointer arc=1	callout pointer arc=30	callout pointer arc=90
Par défaut : : callout pointer arc=15		

\node[draw,cloud callout, aspect=2.5] {texte};

		
cloud puffs=5	aspect=2.5	cloud puff arc=120

\node [draw,cloud callout,callout pointer start size=.1] {texte};		
		
callout pointer start size=.1	start size=.8cm	start size=20pt and 1pt
Par défaut : : callout pointer start size =.2 of callout		
		
callout pointer end size=.5	callout pointer end size=.8cm	callout pointer segments=3
Par défaut : : callout pointer start size = .1 of callout		Par défaut : : segments=2

17.6 Dans un nœud en diverses formes diverses

Charger l'extension: \usetikzlibrary{shapes.misc}

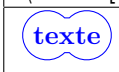
PGFmanual section : 67-8

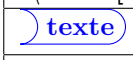
17.6.1 Formes disponibles

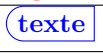
			
cross out	strike out	rounded rectangle	chamfered rectangle

17.6.2 Options

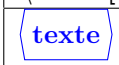
Options pour "rounded rectangle" :

\node [draw, rounded rectangle,rounded rectangle arc length=270] {texte};				
				
270	180	120	90	45

\node [draw, rounded rectangle,rounded rectangle west arc=concave] {texte}; \node [draw, rounded rectangle,rounded rectangle left arc=concave] {texte};			
			
concave	convex	none	

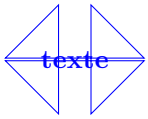
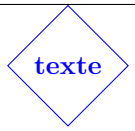
\node [draw, rounded rectangle,rounded rectangle east arc=concave] {texte}; \node [draw, rounded rectangle,rounded rectangle right arc=concave] {texte};		
		
concave	convex	none

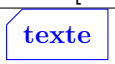
Options pour "chamfered rectangle" :

\node [draw, chamfered rectangle,chamfered rectangle angle=30] {texte};			
			
10	30	60	80
Par défaut : : 45			

\node [draw, chamfered rectangle,chamfered rectangle xsep=10pt] {texte};				
				
xsep=0pt	xsep=5pt	xsep=10pt	xsep=-10pt	xsep=2cm
Par défaut : : 0.666ex				

\node [draw, chamfered rectangle,chamfered rectangle ysep=10pt] {texte};				
				
ysep=0pt	ysep=5pt	ysep=10pt	ysep=-10pt	ysep=1cm

\node [draw, chamfered rectangle,chamfered rectangle ysep=10pt] {texte};				
				
sep=0pt	sep=5pt	sep=10pt	sep=-10pt	sep=1cm

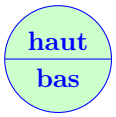
\node [draw, chamfered rectangle,chamfered rectangle corners=north west] {texte};		
		
north west	{north east, south east}	{north east, south west}

17.7 Nœuds à plusieurs parties

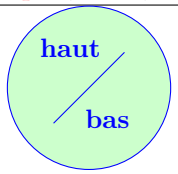
Charger l'extension: \usetikzlibrary{shapes.multipart}

PGFmanual section : 67-6

\node [circle split,draw,fill=green!20]{haut \nodepart{lower} bas };



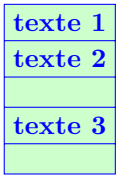
circle split



circle solidus

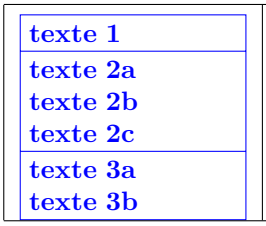
ellipse split

rectangle split



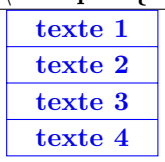

```
\node[rectangle split,rectangle split parts=5,
draw]
{texte 1
\nodepart{second} texte 2
\nodepart{four} texte 3};

Par défaut : : rectangle split parts=4
```

\node [rectangle split,rectangle split parts=3,rectangle split horizontal,draw,blue]
{texte1\nodepart{two}texte2\nodepart{three}texte3};

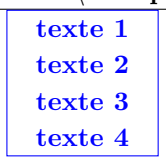



```
\node[rectangle split,rectangle split parts=5,
draw]
{texte 1
\nodepart{second} texte 2a \\texte 2b \\
texte 2c
\nodepart{three} texte 3a \\ texte 3b };
```

\node[rectangle split, draw,blue,minimum size = 2cm,rectangle split draw splits= true]
{texte 1 \nodepart{two} texte 2 \nodepart{three} texte 3 \nodepart{four} texte 4};

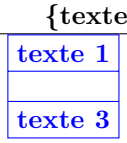


rectangle split draw splits= true
Par défaut :

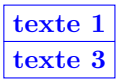


rectangle split draw splits= false

\node [rectangle split,rectangle split parts=3,draw,rectangle split ignore empty parts=false]
{texte 1 \nodepart{second} \nodepart{third}texte 3};

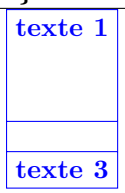
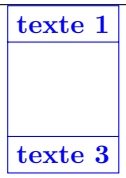


rectangle split ignore empty parts=false

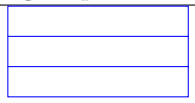
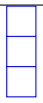


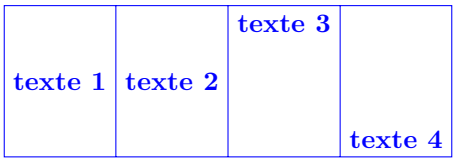
rectangle split ignore empty parts=true

\node [rectangle split,rectangle split parts=3,draw,rectangle split empty part depth=1cm] {texte 1 \nodepart{second} \nodepart{third}texte 3};

	
rectangle split empty part depth=1cm	text depth=1cm
Par défaut : : 0ex	Par défaut : : 0ex
	
rectangle split empty part height=1cm	text height=1cm
Par défaut : : 1ex	Par défaut : : 1ex

\node [rectangle split,rectangle split parts=3,draw,rectangle split empty part width=1cm] {};

	
rectangle split empty part width=2cm	Par défaut : : 1ex

	\node[rectangle split, draw,blue,minimum size = 2cm, rectangle split part align={center, left,right}] {texte 1 \nodepart{two} texte 2 \nodepart{three} texte 3 \nodepart{four} texte 4};
	\node[rectangle split, draw,blue,minimum size = 2cm, rectangle split horizontal, rectangle split part align={center,base, top,bottom}] {texte 1 \nodepart{two} texte 2 \nodepart{three} texte 3 \nodepart{four} texte 4};

	\node[rectangle split, draw,blue, minimum width=1cm, rectangle split part fill={red, green,cyan}]{};

17.8 Mise en forme du texte

17.8.1 Position

PGFmanual section : 17-4-3

```
\tikz \draw (0,0) node[fill=blue!10,text width=2cm,text justified]
{Ceci est une démonstration d'un texte sur une largeur de 2cm};
```

Ceci est une démonstration d'un texte sur une largeur de 2cm.	Ceci est une démonstration d'un texte sur une largeur de 2cm	Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .
sans option	text justified	text centered	text ragged
Ceci est une démonstration d'un texte sur une largeur de 2cm.	Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .
text badly ragged	text badly centered	align=center	align=flush center
Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .	Ceci est une démonstration d'un texte sur une largeur de 2cm .
align=justify	align=flush right	align=right	align=flush left

AAA | BBB CCC | DDD	\tikz \node [draw] { \begin{tabular}{|c|c|} \hline AAA & BBB \\ \hline CCC & DDD \\ \hline \end{tabular} };

```
\tikz[align=left] \node[draw] {AAA \\ BBBBBBBB \\ CC};
```

AAA BBBBBBBB CC	AAA BBBBBBBB CC	AAA BBBBBBBB CC
[align=left]	[align=center]	[align=right]

\tikz[align=left] \node[draw] {AAA \\ [1cm] BBBBBBBB };	
AAA BBBBBBBB	BBBBBBBB AAA
[1cm]	[-1cm]

17.8.2 Couleur et fontes

Texte.	*Texte.*	*Texte.*	Texte.	Texte.	Texte.
[text= red]	[font=\itshape]	[font=\slshape]	[font=\scshape]	[font=\upshape]	[font=\bfseries]

17.8.3 Taille des fontes

\tikz \draw (0,0) node[font=\tiny]{Texte.}						
Texte.	Texte.	Texte.	Texte.	Texte.	Texte.	Texte.
\tiny	\footnotesize	\small	\large	\Large	\huge	\Huge

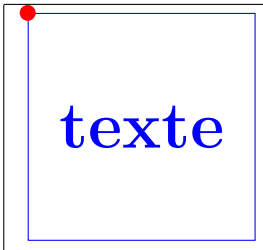
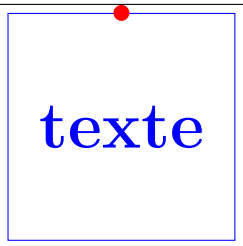
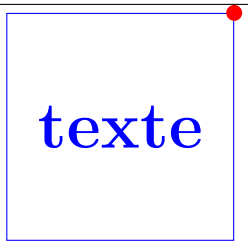
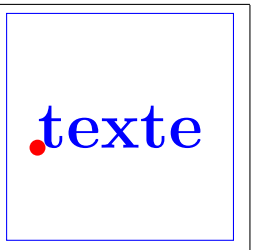
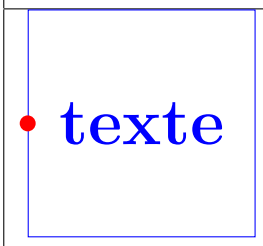
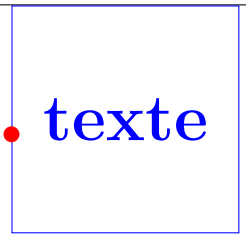
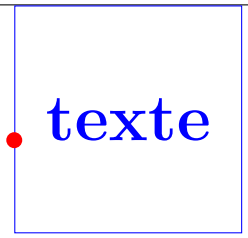
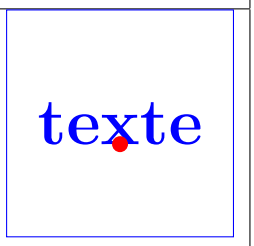
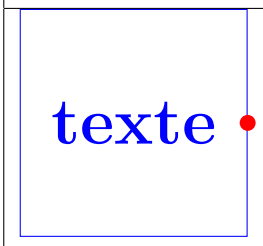
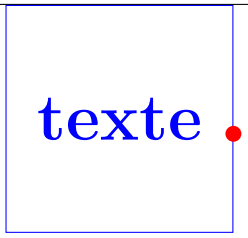
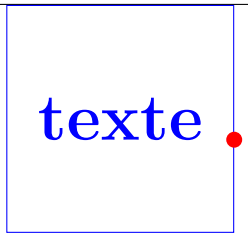
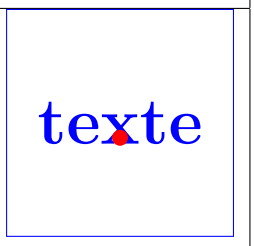
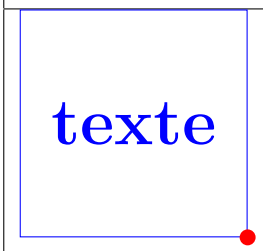
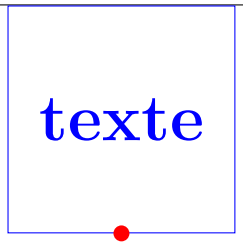
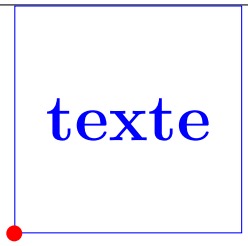
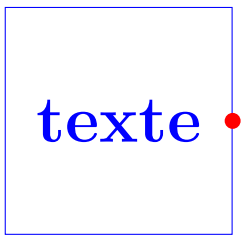
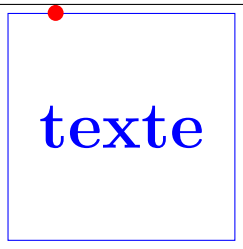
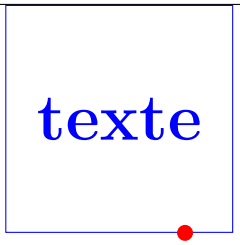
PGFmanual section : 17-4-4

Texte.	Texte.	Texte.
text height=1cm	text depth=1cm	text height=0.5cm, text depth=0.5cm

17.9 Positions prédéfinies sur un nœud

17.9.1 pour l'ensemble des nœuds

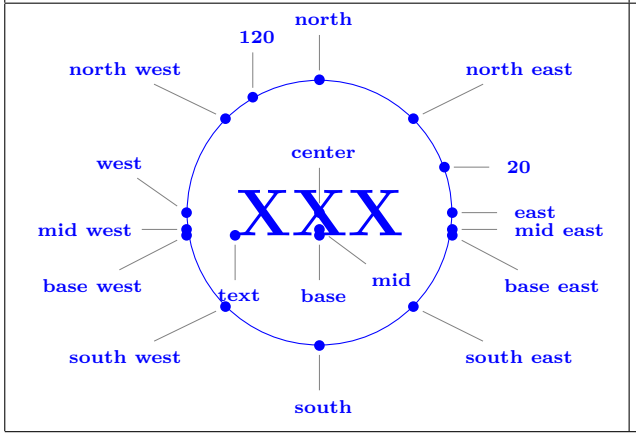
PGFmanual section : 17-5-1

			
north west	north	north east	text
			
west	mid west	base west	base
			
east	mid esat	base east	mid
			
south east	south	south west	center
			
0	120	-60	

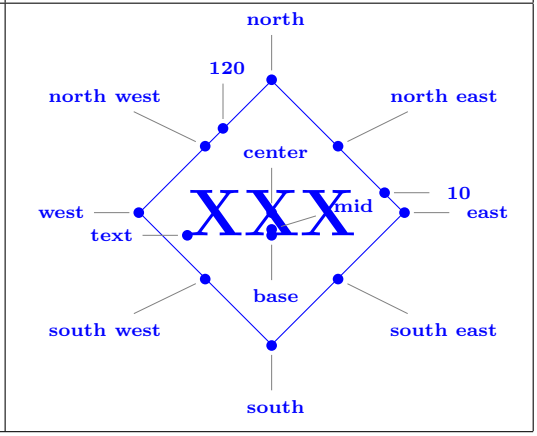
17.9.2 spécifique à un nœud

Consultez PGFmanual section : 67

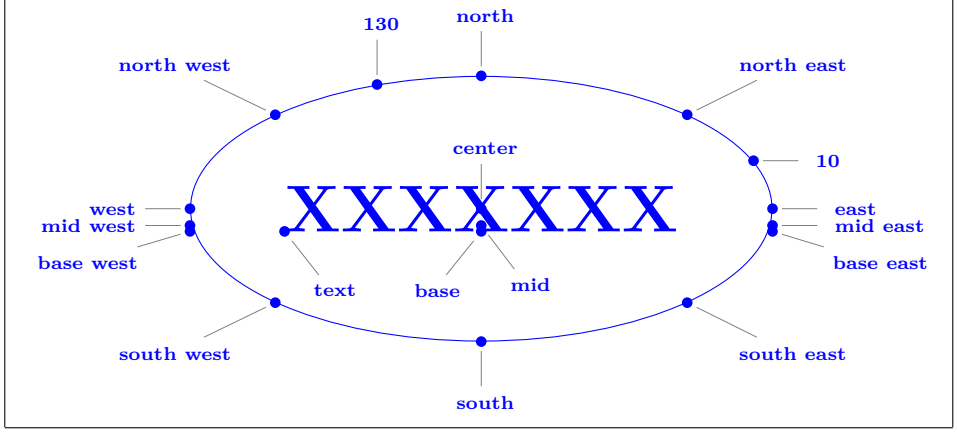
shape=circle



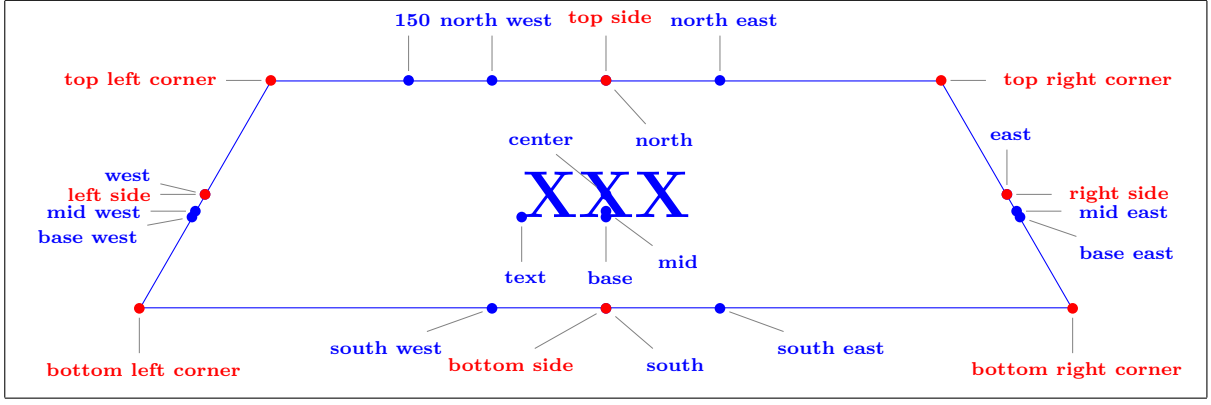
shape=diamond



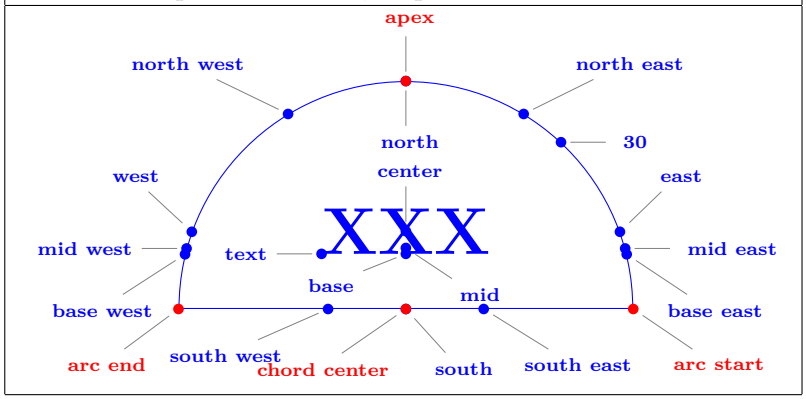
shape=ellipse



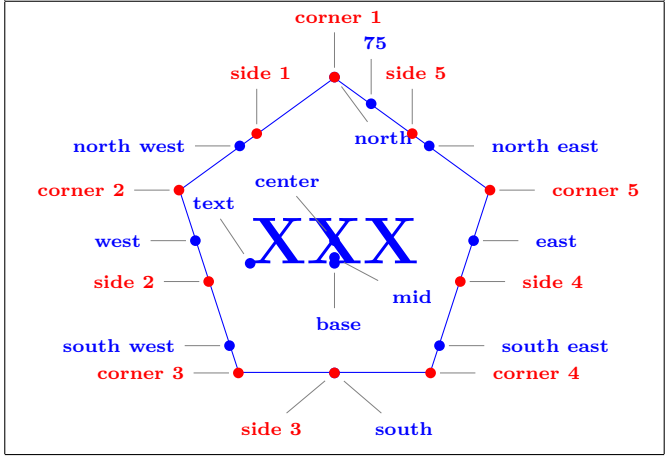
shape=trapezium



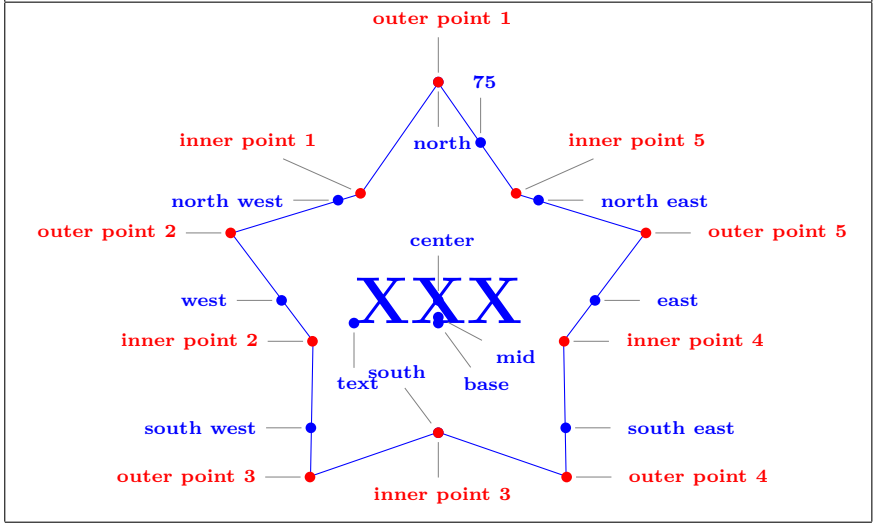
shape=semicircle,shape border rotate=0



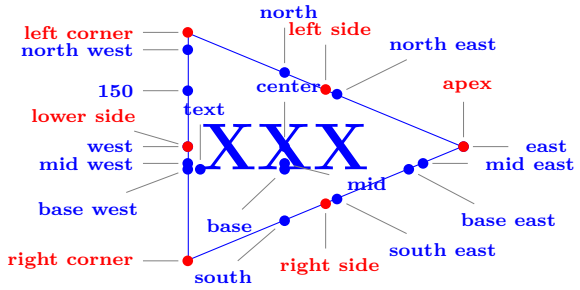
shape=regular polygon



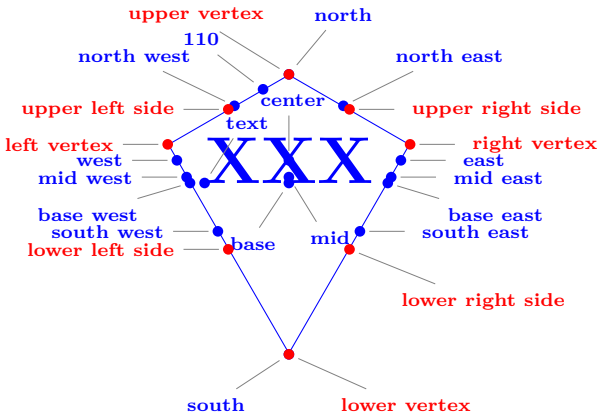
shape=star



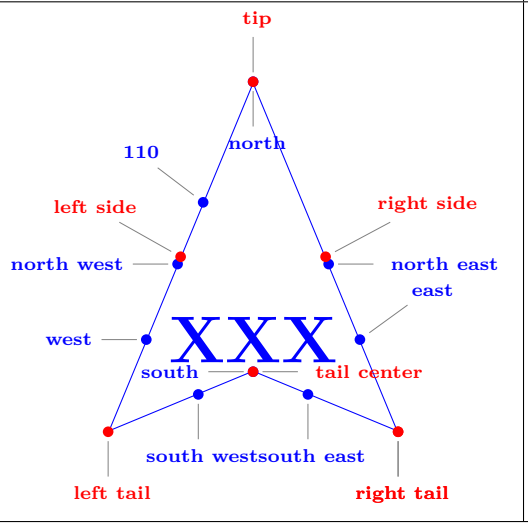
shape= isosceles triangle



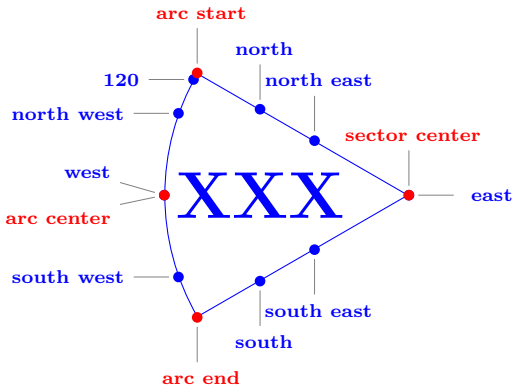
shape= kite



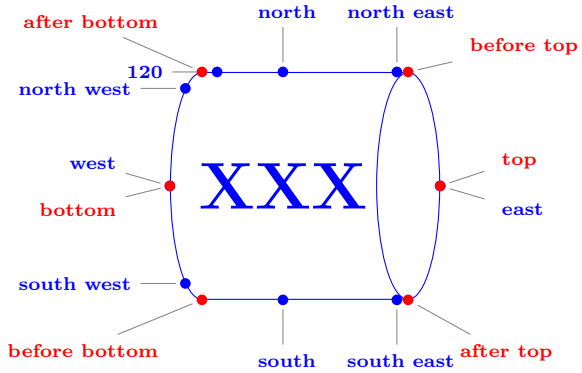
shape= dart



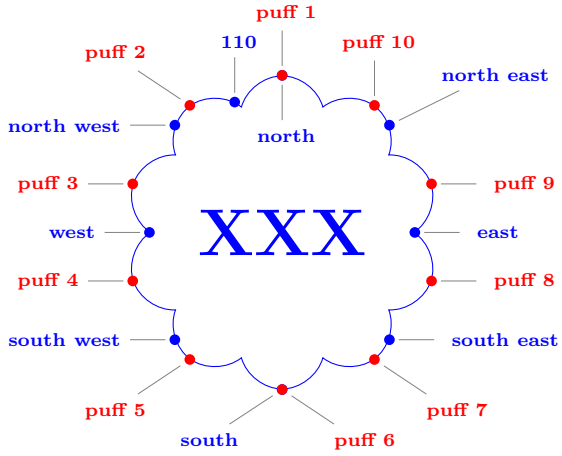
shape= circular sector



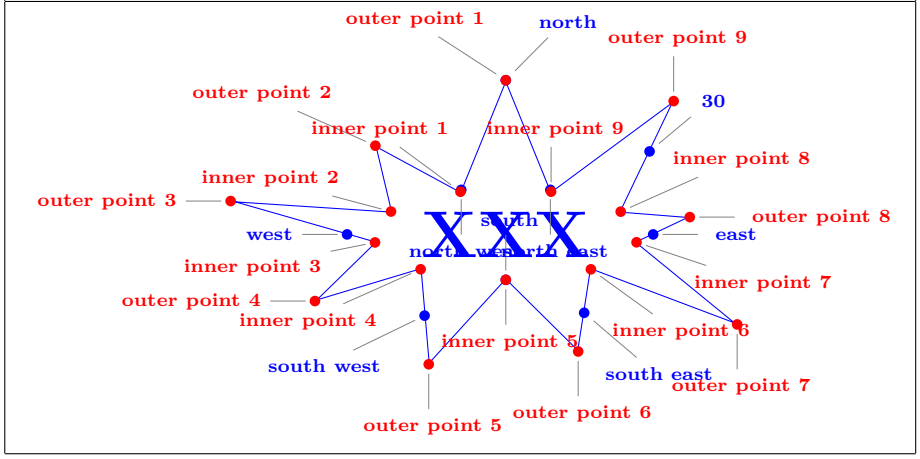
shape=cylinder



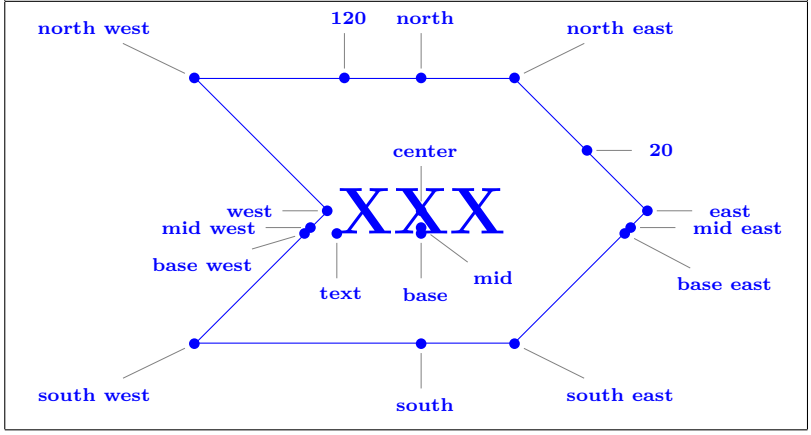
shape=cloud



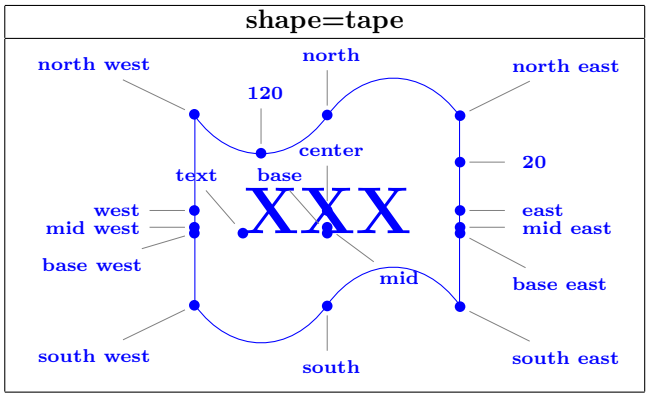
shape=starburst



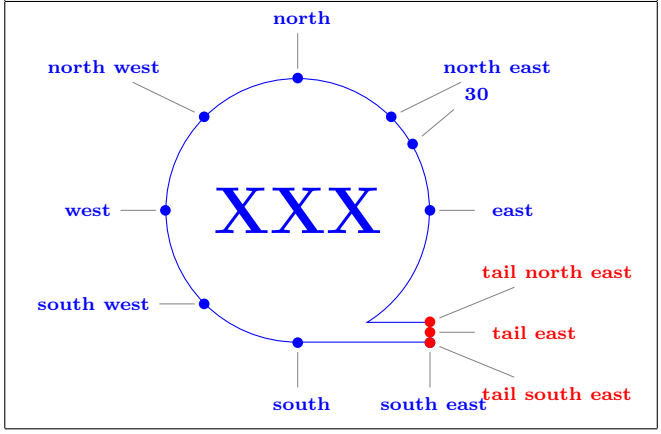
shape=signal



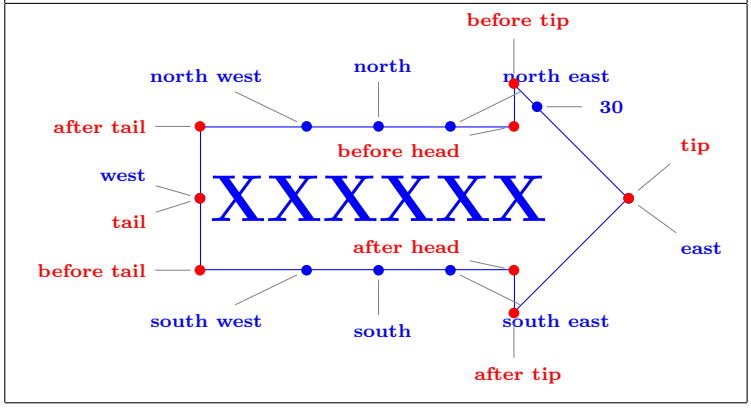
shape=tape



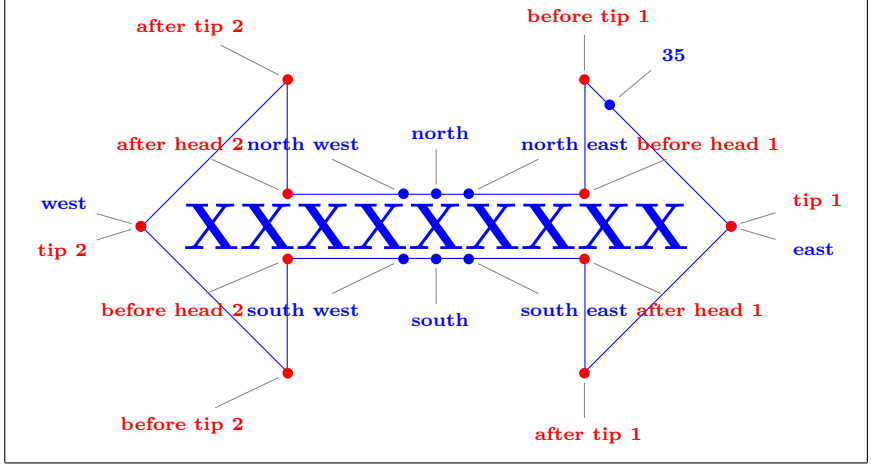
shape=magnetic tape



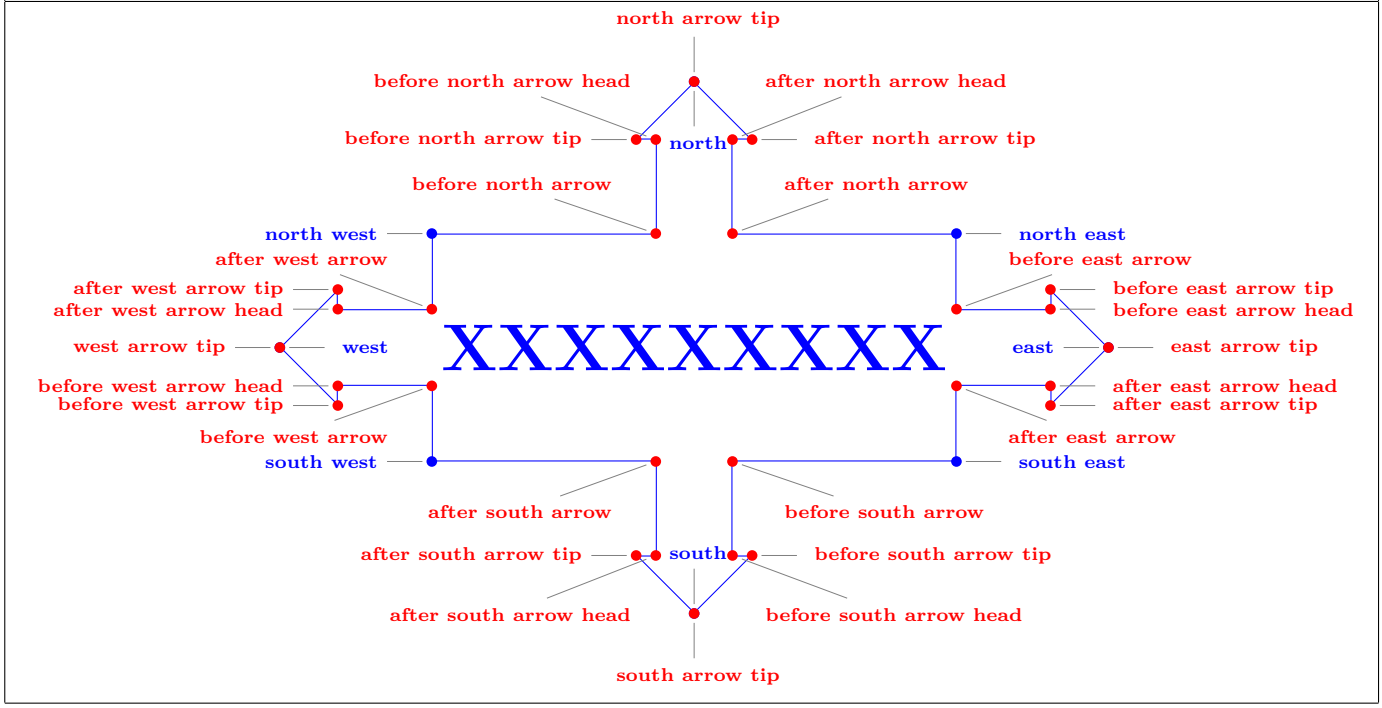
shape=single arrow



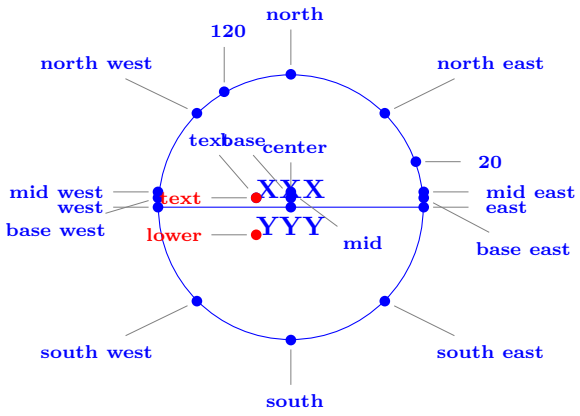
shape=double arrow



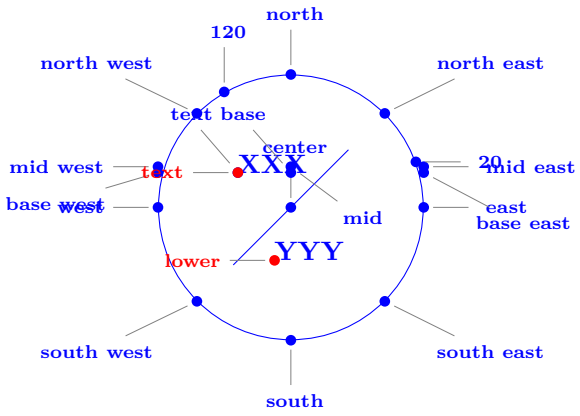
shape=arrow box



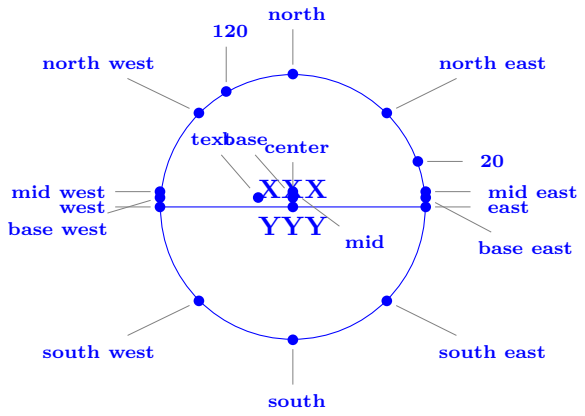
shape=circle split



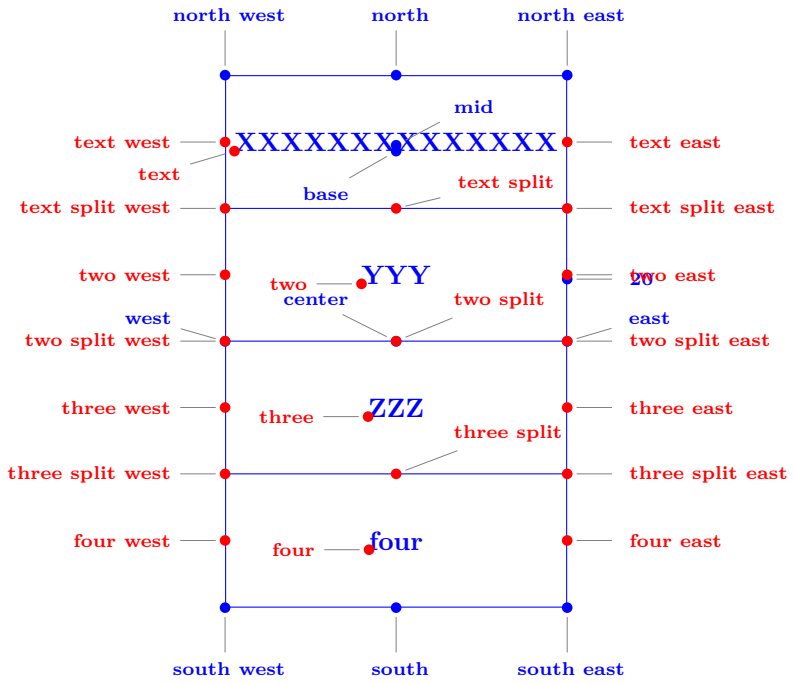
shape=circle solidus



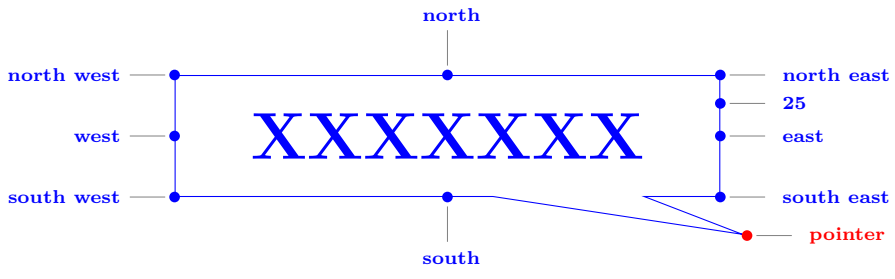
shape=ellipse split



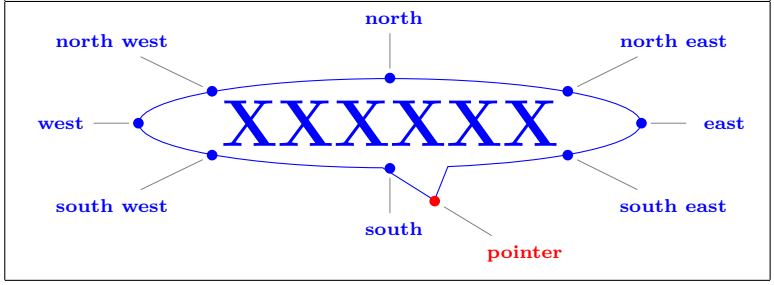
shape=rectangle split



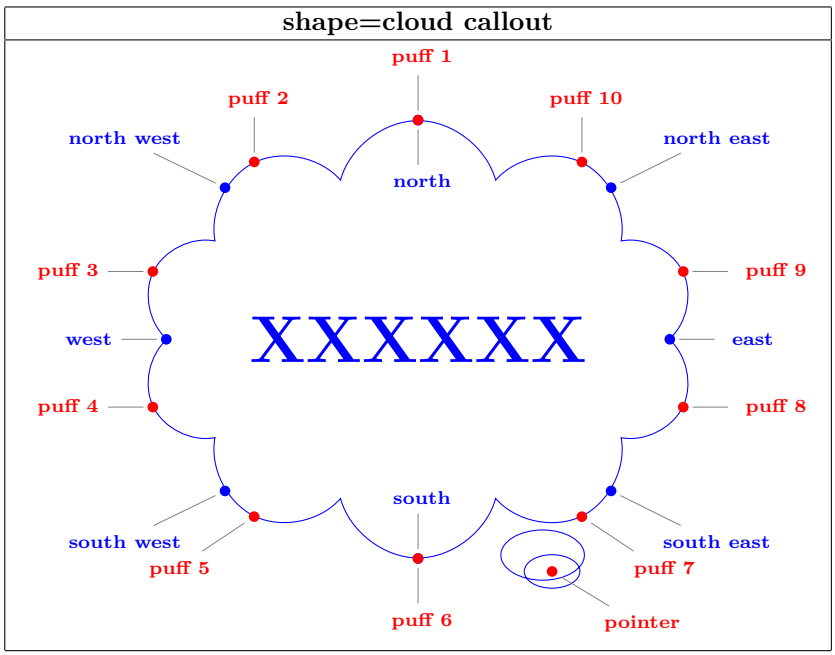
shape=rectangle callout



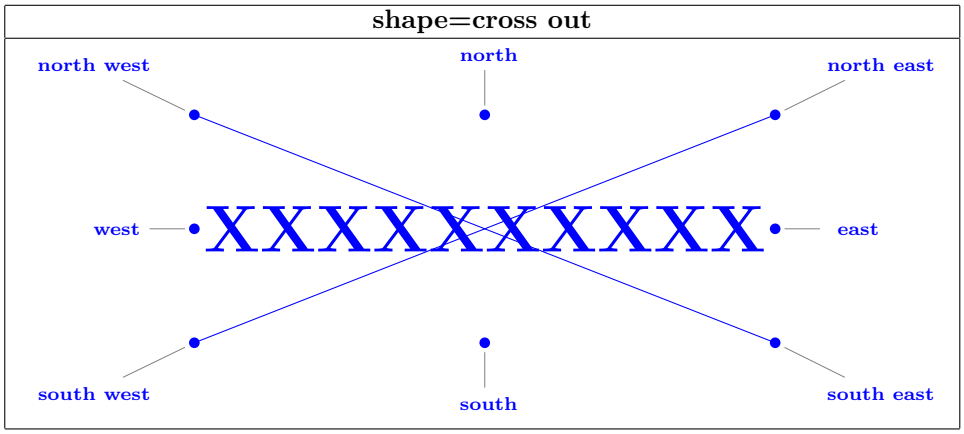
shape=ellipse callout



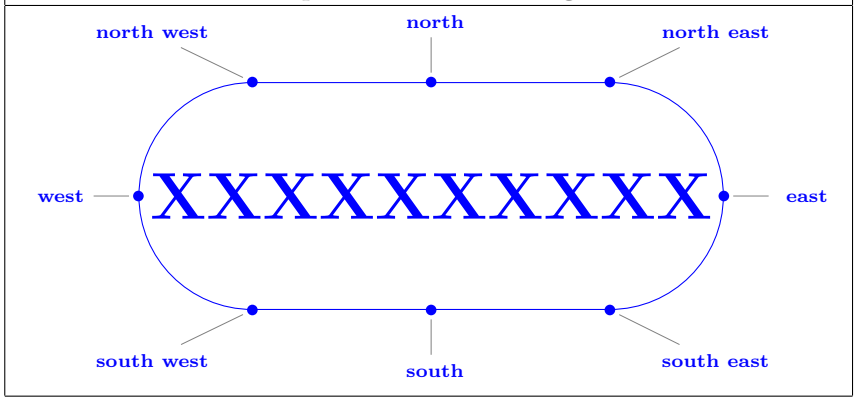
shape=cloud callout



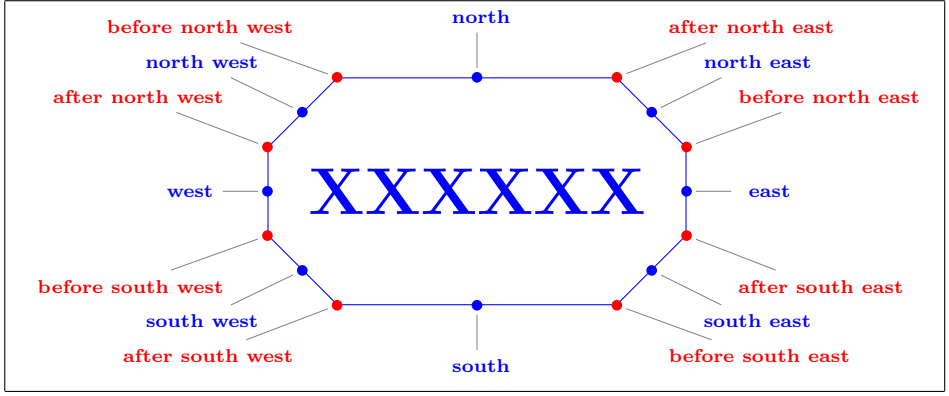
shape=cross out



shape=rounded rectangle



shape=chamfered rectangle

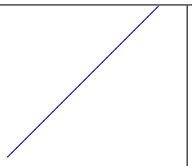
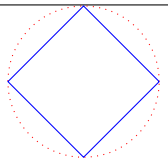
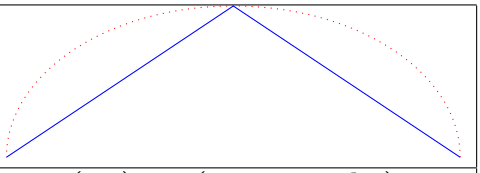


18 Decorations

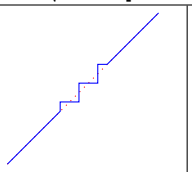
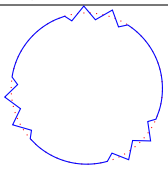
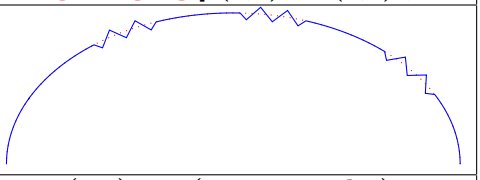
18.1 Library “decorations.pathmorphing”

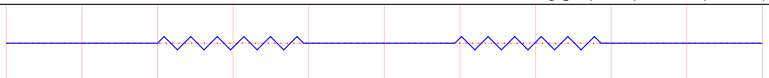
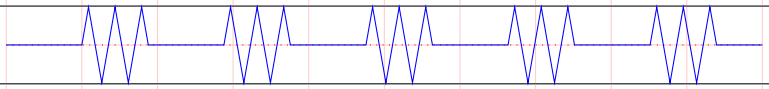
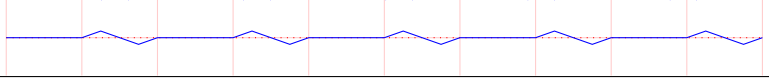
PGFmanual section : 48-2

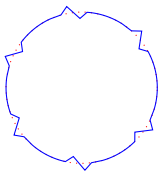
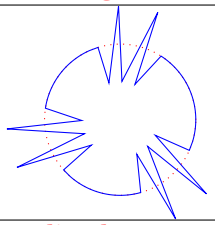
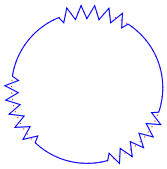
18.1.1 “lineto”

		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

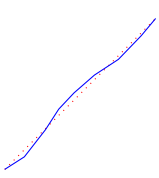
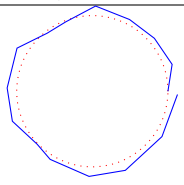
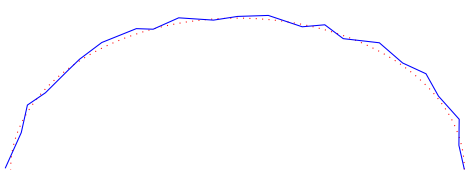
18.1.2 “straight zigzag”

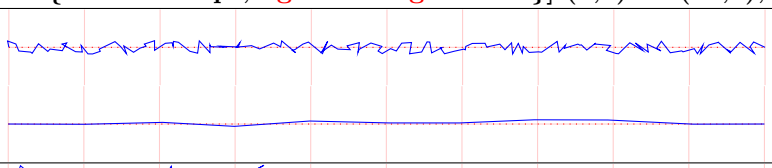
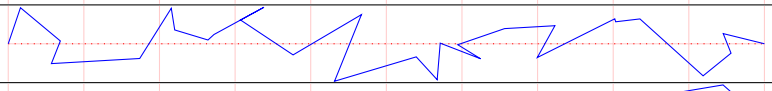
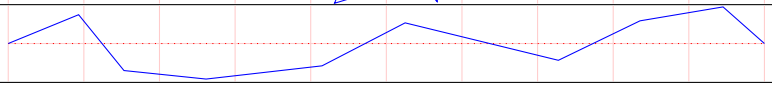
\draw[decorate,decoration=straight zigzag] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2);

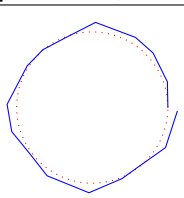
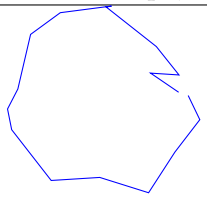
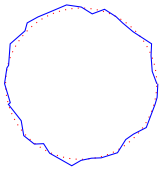
\draw[decorate,decoration={straight zigzag,meta-segment length=2cm}] (0,0) - - (10,0);		Par défaut :
meta-segment length=2cm		1cm
amplitude=0.5cm		2.5pt
segment length=1cm		10pt

\draw[decorate,decoration= {straight zigzag,meta-segment length=0.5cm}] (1,1) circle (1);		
		
meta-segment length=2cm	amplitude=0.5cm	segment length=5pt

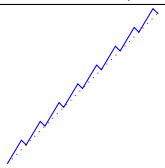
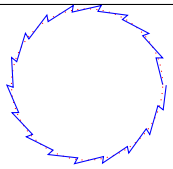
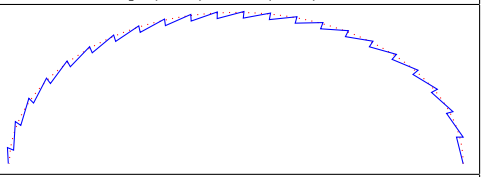
18.1.3 “random steps”

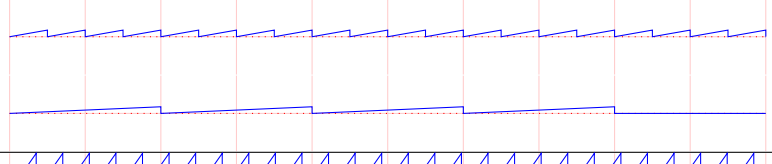
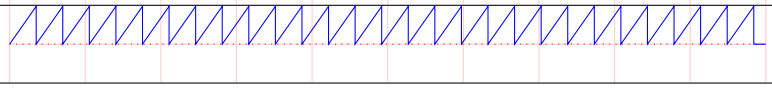
\draw[decorate,decoration=random steps] (0,0) - - (2,2) ;		
		
(0,0) – (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

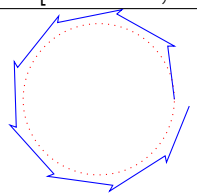
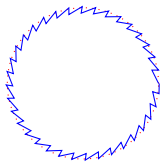
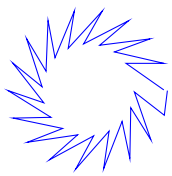
\draw[decorate,decoration={random steps,segment length=2cm}] (0,0) - - (10,0);		Par défaut :
segment length=2pt segment length=1cm		10pt
amplitude=0.5cm		2.5pt
amplitude=0.5cm ,segment length=1cm		

\draw[decorate,decoration= {random steps,segment length=2cm}] (1,1) circle (1);		
		
meta-segment length=2cm	amplitude=0.5cm	segment length=5pt

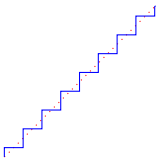
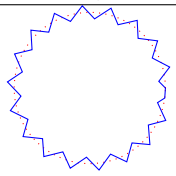
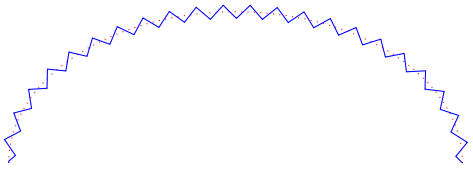
18.1.4 “saw”

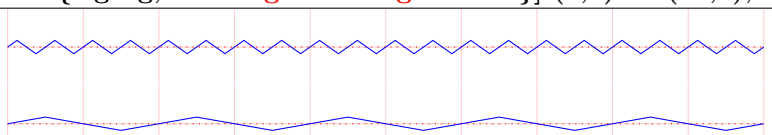
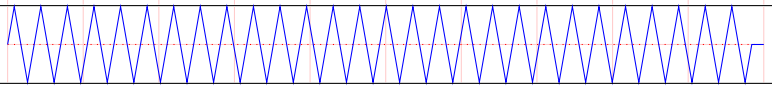
\draw[decorate,decoration=saw] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2);

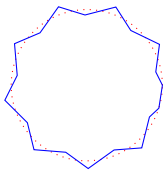
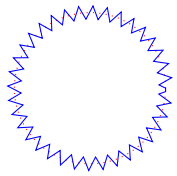
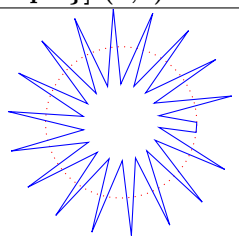
\draw[decorate,decoration={saw,meta-segment length=0.5cm}] (0,0) - - (10,0);		Par défaut :
segment length=0.5cm segment length=2cm		10 pt
amplitude=0.5cm		2.5 pt

\draw[decorate,decoration={saw,segment length=20pt}] (1,1) circle (1);		
		
segment length=20pt	segment length=5pt	amplitude=0.5cm

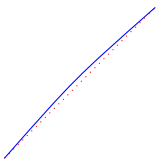
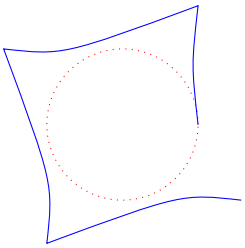
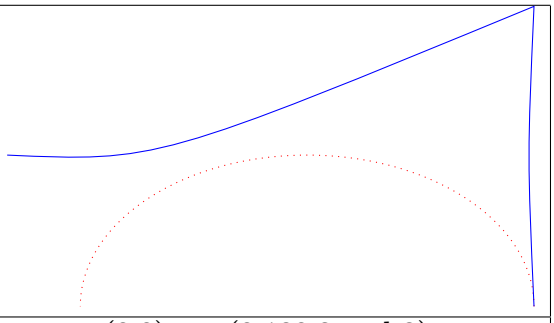
18.1.5 “zigzag”

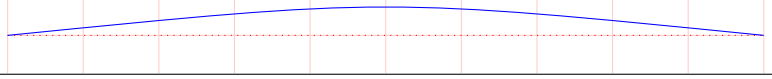
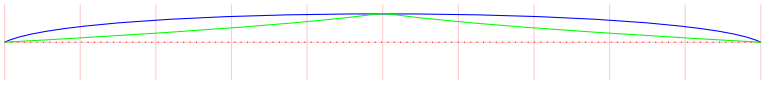
\draw[decorate,decoration=zigzag] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2);

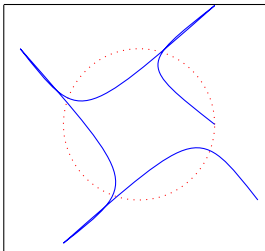
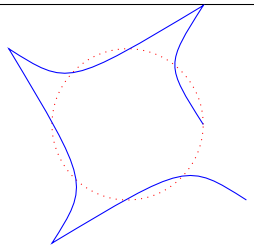
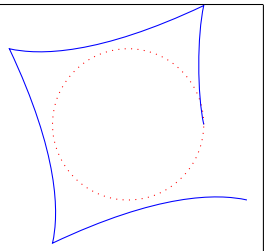
\draw[decorate,decoration={zigzag,meta-segment length=2cm}] (0,0) - - (10,0);		Par défaut :
segment length=0.5cm segment length=2cm		10pt
amplitude=0.5cm		2.5 pt

\draw[decorate,decoration= {saw,segment length=20pt }] (1,1) circle (1);		
		
segment length=20pt	segment length=5pt	amplitude=0.5cm

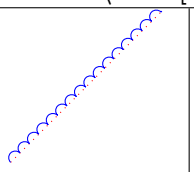
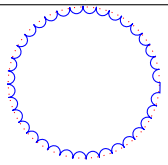
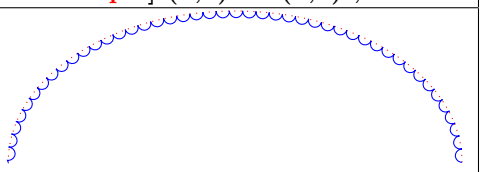
18.1.6 “bent”

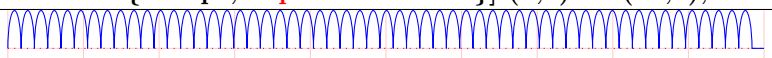
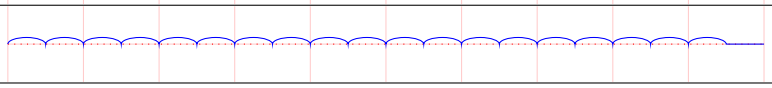
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2);

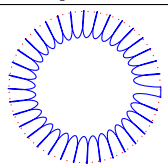
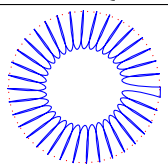
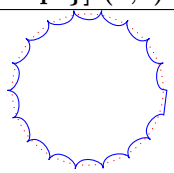
\draw[decorate,decoration={bent,amplitude=0.5cm}] (0,0) – (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
aspect=0.1 (en bleue) aspect=0.9 (en vert) amplitude=0.5cm		0.5

		
amplitude=1cm	amplitude=0.5cm	aspect=0.25

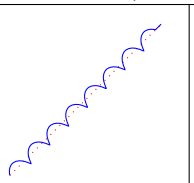
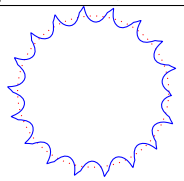
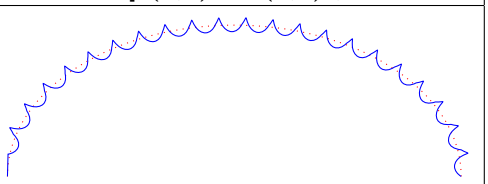
18.1.7 “bumps”

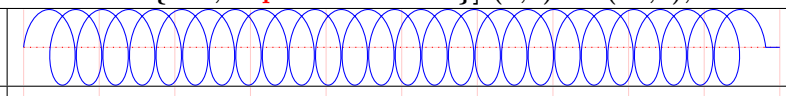
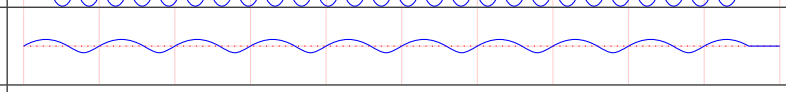
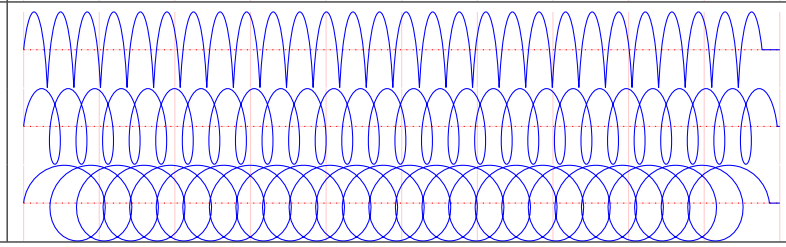
\draw[decorate,decoration=bumps] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

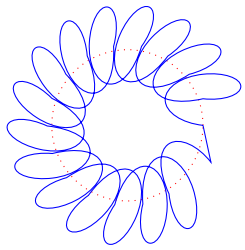
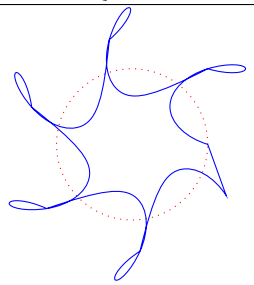
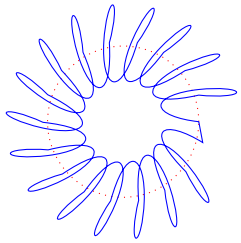
\draw[decorate,decoration={bumps,amplitude=0.5cm}] (0,0) - - (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
segment length=1cm		10 pt

\draw[decorate,decoration= {bumps,amplitude=10pt}] (1,1) circle (1);		
		
amplitude=10pt	amplitude=0.5cm	segment length=20pt

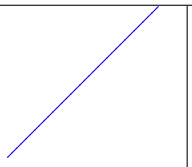
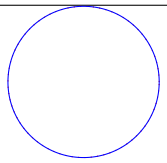
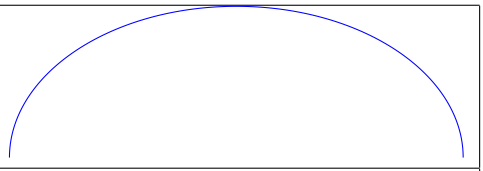
18.1.8 “coil”

\draw[decorate,decoration=coil] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

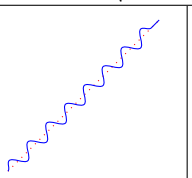
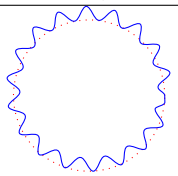
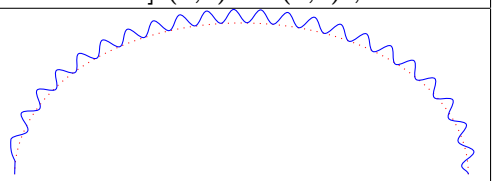
\draw[decorate,decoration={coil,amplitude=0.5cm}] (0,0) - - (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
segment length=1cm		10 pt
aspect=0.1 (amplitude=0.5cm) aspect=0.3 aspect=0.9		0.5

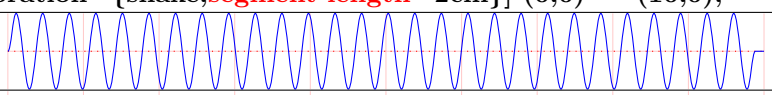
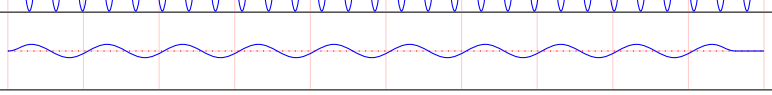
\draw[decorate,decoration= {coil,amplitude=0.5cm}] (1,1) circle (1);		
		
amplitude=0.5 cm	segment length=1cm amplitude=0.5cm	aspect=0.25 amplitude=0.5cm

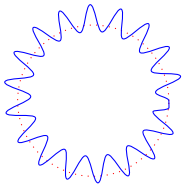
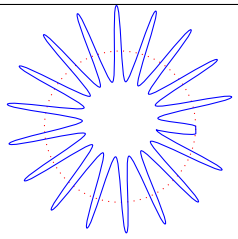
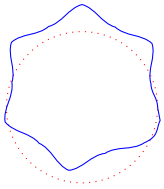
18.1.9 “curveto”

		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

18.1.10 “snake”

\draw[decorate,decoration=snake] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

\draw[decorate,decoration={snake,segment length=2cm}] (0,0) - - (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
segment length=1cm		10 pt

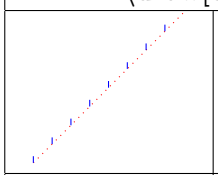
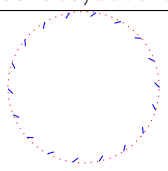
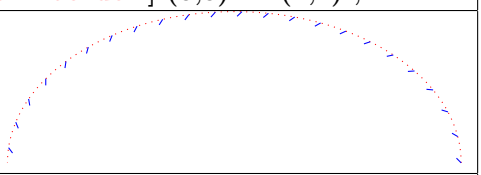
\draw[decorate,decoration= snake, amplitude=5pt] (1,1) circle (1);		
		
amplitude=5pt	amplitude=0.5cm	segment length=5pt

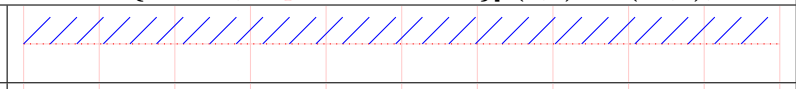
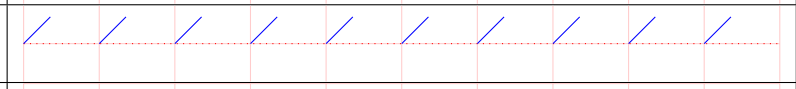
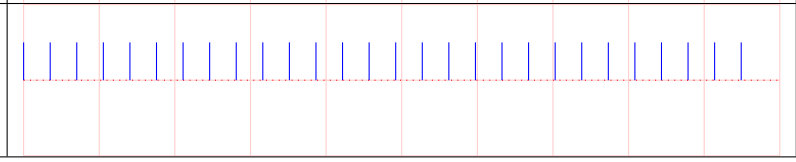
18.2 Library “decorations.pathreplacing”

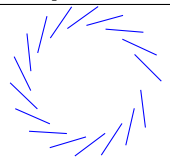
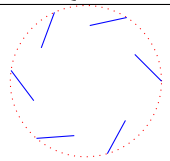
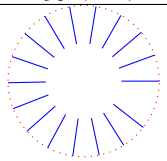
Charger l’extension: \usetikzlibrary{decorations.pathreplacing}

PGFmanual section : 48-3

18.2.1 “border”

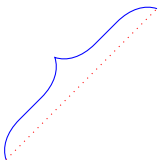
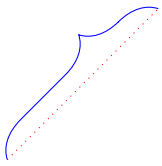
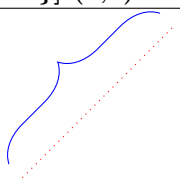
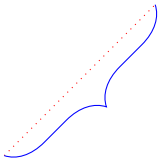
\draw[decorate,decoration=border] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

\draw[decorate,decoration={border,amplitude=0.5cm}] (0,0) - - (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
segment length=1cm , amplitude=0.5cm		10 pt
angle=90 , amplitude=0.5cm		45

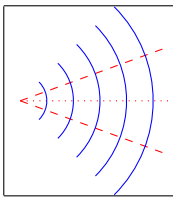
\draw[decorate,decoration= {border,amplitude=0.5cm}] (1,1) circle (1);		
		
amplitude=0.5cm	segment length=1cm ,amplitude=0.5cm	angle=90 ,amplitude=0.5cm

18.2.2 “brace”

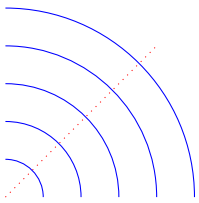
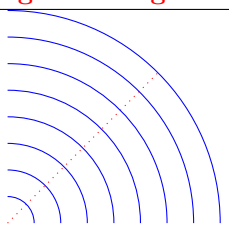
	\draw [decorate,decoration=brace] (0,0) - - (3,1);

\draw[decorate,decoration= {brace,amplitude=0.5cm}] (1,1) circle (1); ;			
			
amplitude=0.5cm	aspect=0.65 ,amplitude = 0.5cm	raise= 0.25cm ,amplitude = 0.5cm	mirror ,amplitude = 0.5cm
Par défaut : : 2.5	Par défaut : : 0.5	Par défaut : : 0	

18.2.3 ” expanding waves”



```
\draw [dashed,red](0,0) - - (20:2) ;
\draw [dashed,red](0,0) - - (-20:2) ;
\draw [decorate,decoration={expanding waves}](0,0) - -
(2,0) ;
```

\draw[decorate,decoration= {expanding waves,segment length=0.5cm}] (1,1) circle (1);	
	
segment length=0.5cm	angle=45
Par défaut : : 10pt	Par défaut : : 20

18.2.4 “moveto”

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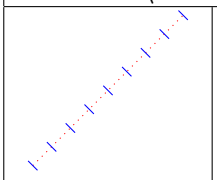
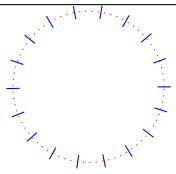
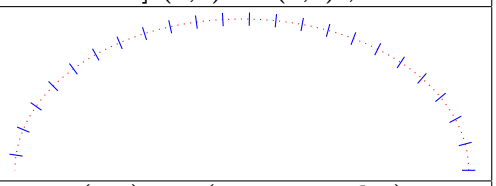
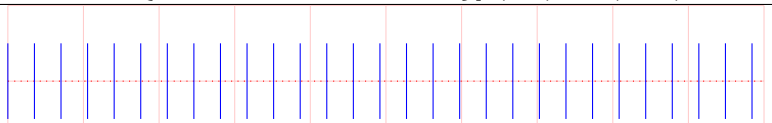
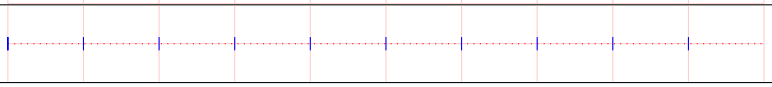
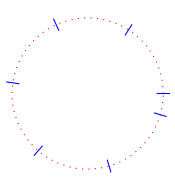
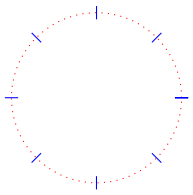
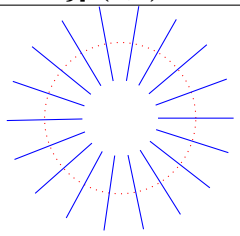
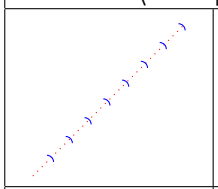
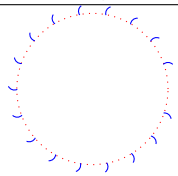
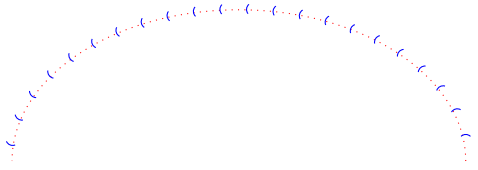
18.2.5 “ticks”

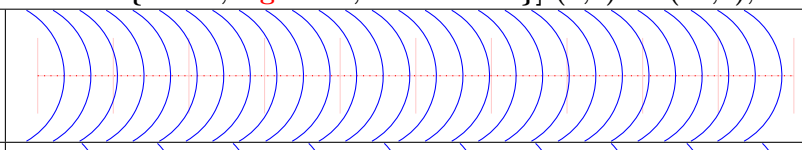
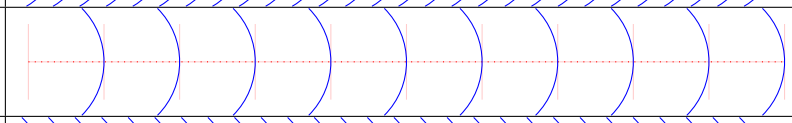
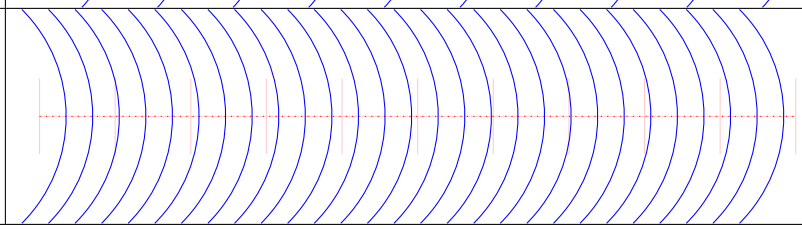
\draw[decorate,decoration=ticks] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

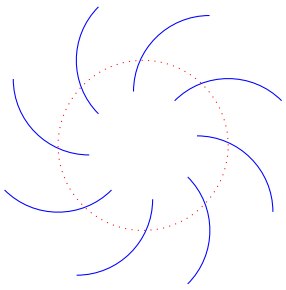
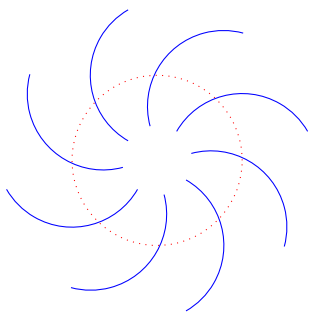
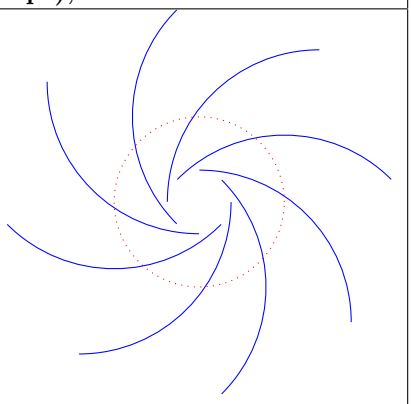
\draw[decorate,decoration={ticks,amplitude=0.5cm}] (0,0) - - (10,0);		Par défaut :
amplitude=0.5cm		2.5 pt
segment length=1cm		10 pt

\draw[decorate,decoration= {ticks,segment length=1cm}] (1,1) circle (1);		
		
segment length=1cm (1,1) circle (1)	segment length=pi*8 (1,1) circle (32pt)	amplitude=0.5cm (1,1) circle (1)

18.2.6 ” waves”

\draw[decorate,decoration=waves] (0,0) - - (2,2) ;		
		
(0,0) - - (2,2)	(1,1) circle (1)	(0,0) arc (0:180:3 and 2)

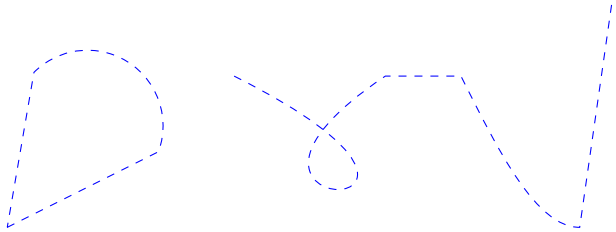
\draw[decorate,decoration={waves,angle=60,radius=1cm}] (0,0) - - (10,0);		Par défaut :
angle=60		45
segment length=1cm		10 pt
radius=2cm		10 pt

\draw[decorate,decoration= {waves,segment length=pi*8, radius=1cm}] (1,1) circle (32pt);		
		
segment length = pi*8	angle=60 , segment length = pi*8	radius=2cm , segment length = pi*8

18.2.7 “show path construction”

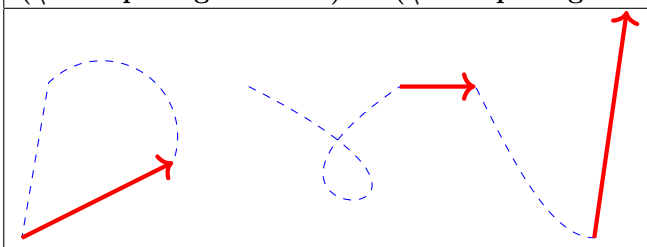
Chemin à décorer

```
\draw [blue,dashed] (0,0) - - (2,1) arc (-20:135:1) - - cycle
(3,2) .. controls (7,0) and (2,0) .. (5,2) - - (6,2) sin (7.57,0) - - (8,3) ;
```



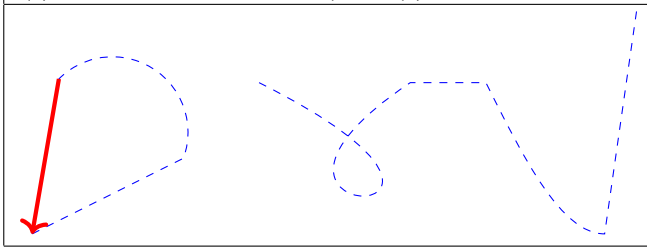
composantes linéaires : “lineto”

```
decoration={ show path construction,
lineto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) - - (\tikzinputsegmentlast); },}
```



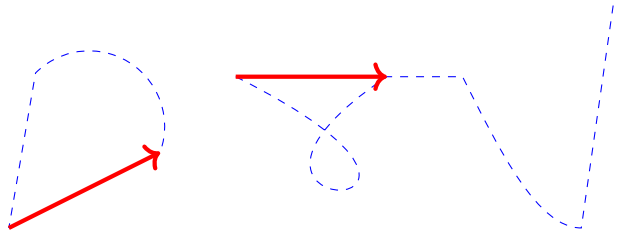
Fermetures de chemin : “closepath”

```
decoration={ show path construction,
closepath code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) - - (\tikzinputsegmentlast); },}
```



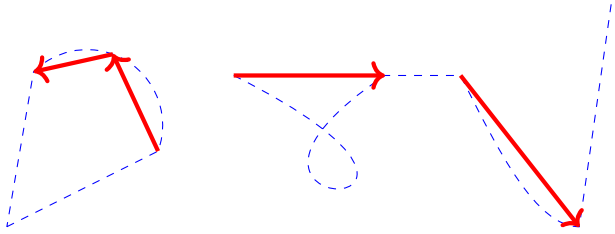
coupure de chemin : “moveto”

```
decoration={ show path construction,
moveto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) - - (\tikzinputsegmentlast); },}
```

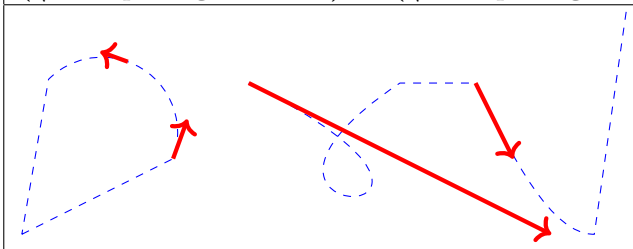


composants courbes : “curveto”

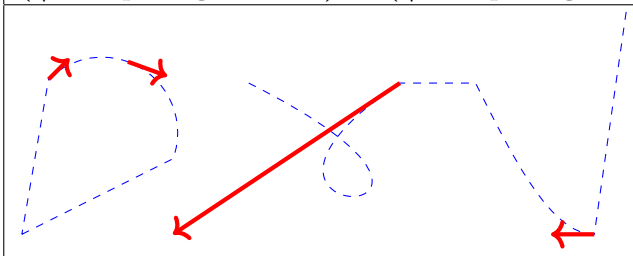
```
decoration={ show path construction,
curveto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) - - (\tikzinputsegmentlast); },}
```



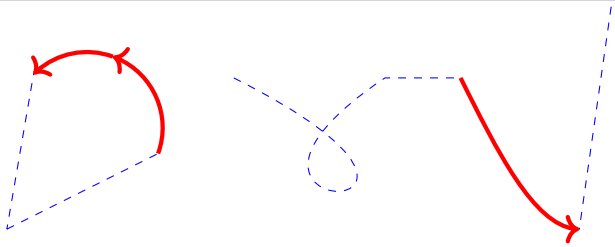
```
decoration={ show path construction,
curveto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) - - (\tikzinputsegmentsupporta); },}
```



```
decoration={ show path construction,
curveto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentlast) - - (\tikzinputsegmentsupportb); },}
```



```
decoration={ show path construction,
curveto code={ \draw [red,ultra thick,->]
(\tikzinputsegmentfirst) .. controls (\tikzinputsegmentsupporta)
and (\tikzinputsegmentsupportb) .. (\tikzinputsegmentlast) ; },}
```



.. controls (7,0) and (2,0) .. (5,2) ne fonctionne pas !

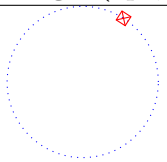
18.3 Library “decorations.markings”

Charger l’extension: \usetikzlibrary{decorations.markings}

PGFmanual section : 48-4

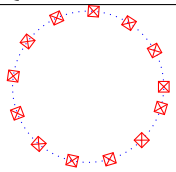
18.3.1 Sa marque à une position

```
\draw [decorate,decoration={markings,mark=at position 1cm
with { \draw[red] (-2pt,-2pt) - - (2pt,2pt); \draw[red](2pt,-2pt) - - (-2pt,2pt);
\draw[red] (-2pt,-2pt) rectangle (2pt,2pt); }}] (1,1) circle (1);
```

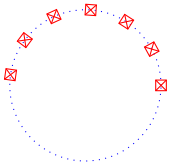


18.3.2 Ses marques : origine, fin et pas

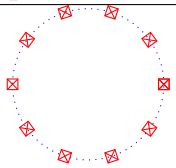
```
\draw[decorate,{markings,mark=between positions 0 and 1 step 5mm with ... }] (1,1) circle (1);;
```



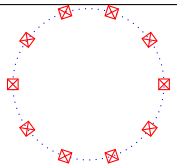
mark=between positions 0 and 1 step 5mm



between positions 0 and 0.5 step 5mm



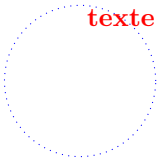
mark= between positions 0 and 1 step 1/10



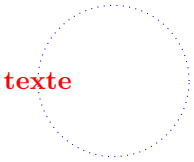
between positions 0 and 1 step0.1

18.3.3 Marque avec un nœud contenant du texte

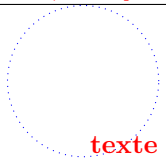
```
decoration={markings,mark=at position 1cm with \node[red]{texte}}
```



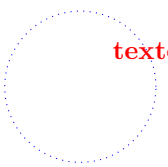
at position 1cm



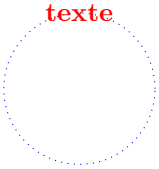
at position 0.5



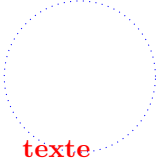
at position -1cm



at position 1cm/2



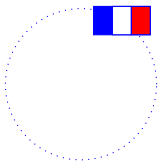
at position 0.5/2



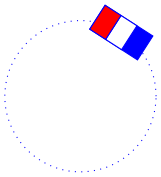
at position -0.5/2

18.3.4 Marque avec un nœud contenant une image

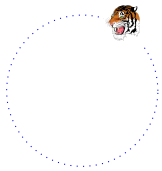
\draw [decorate,decoration={markings,mark=at position 1cm with \node{\DFR}; }] (1,1) circle (1);



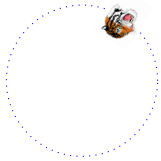
\node{\DFR}



\node[transform shape]{\DFR}

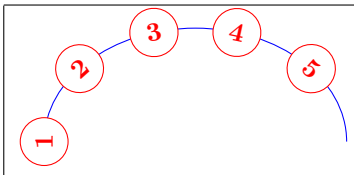


\node{
\includegraphics[width=0.5cm]{tiger} }

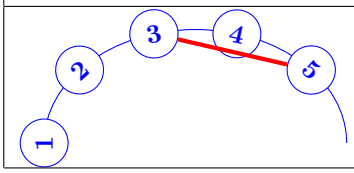


\node[transform shape]{
\includegraphics[width=0.5cm]{tiger} }

18.3.5 Numérotation des marques et affectation d'un nom

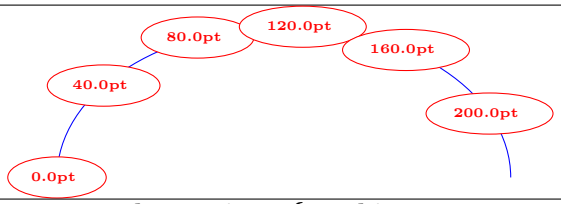


decoration={markings,
mark=between positions 0 and 1 step 0.2
with { \node [draw , circle ,fill=white, name=
marque-\pgfkeysvalueof{/pgf/decoration/mark info/sequence number},
transform shape]
{\pgfkeysvalueof{/pgf/decoration/mark info/sequence number}};}}



\draw [red,ultra thick] (marque-3) - - (marque-5);

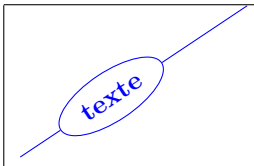
18.3.6 Distance des nœuds



decoration={markings,
mark=between positions 0 and 1 step 40pt with
{ \node [red,draw,ellipse,fill=white,font=\tiny]
{\pgfkeysvalueof{/pgf/decoration/mark info/distance from start} };} }

/pgf/decoration/reset marks (no value)
/pgf/decoration/mark connection node=node name (no default, initially empty)

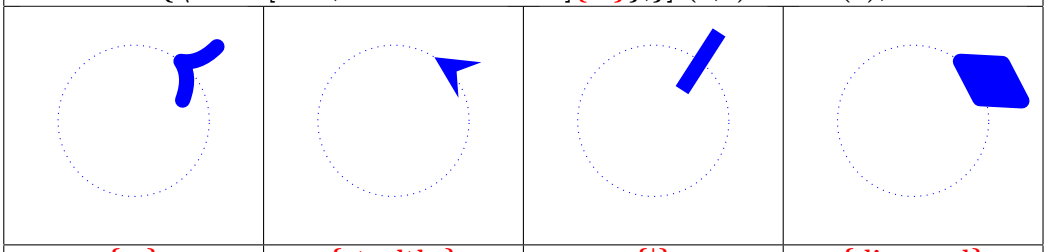
18.3.7 Nœud sur une liaison




```
\draw [decorate,decoration={markings,
mark connection node=mon noeud,mark=at position 0.4 with
{\node [draw,ellipse,blue,transform shape] (mon noeud)
{texte};}}]
(0,0) -- (3,2) ;
```

18.3.8 Arrow Tip Markings

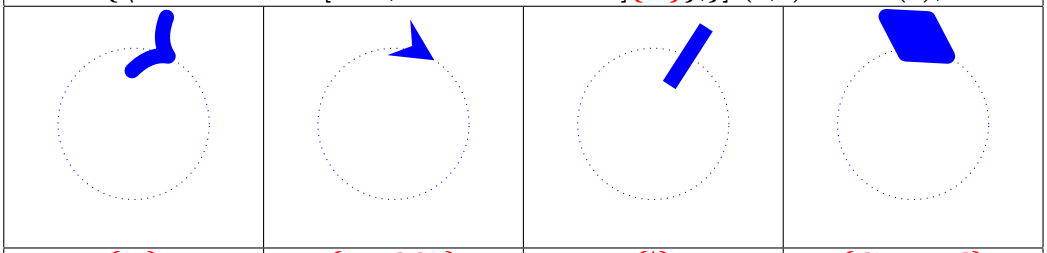
```
\draw[decorate,decoration={ markings,mark=at position 1cm with
{\arrow[blue,line width=2mm]{>}};}] (1,1) circle (1);
```



{>}	{stealth }	{|}	{diamond}

Autres possibilités et paramètres voir page 21 et suivantes

```
\draw[decorate,decoration={markings,mark=at position 1cm with
{\arrowreversed[blue,line width=2mm]{>}};}] (1,1) circle (1);
```



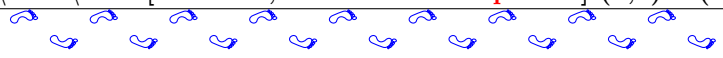
{>}	{stealth }	{|}	{diamond}

18.4 Library “decorations.footprints”

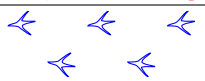
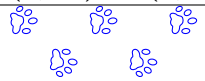
Charger l’extension: \usetikzlibrary{decorations.footprints}

PGFmanual section : 48-5-2

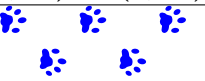
\tikz \draw[decorate,decoration=footprints] (0,0) – (10,0);



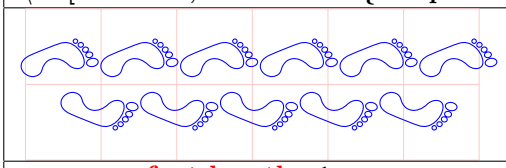
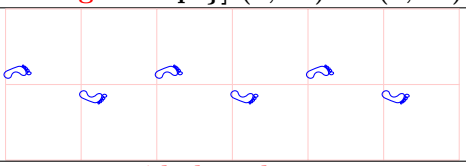
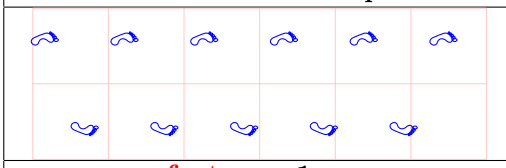
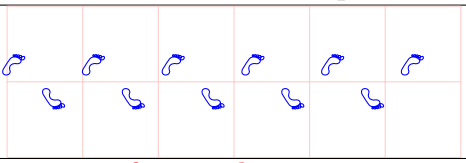
\draw[decorate,decoration={footprints,foot of = gnome }] (0,2.5) - - (3,2.5);

			
foot of = gnome	foot of = human (Par défaut :)	foot of = bird	foot of = felis silvestris

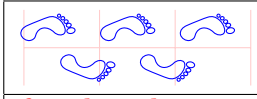
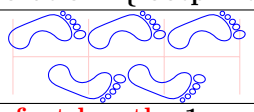
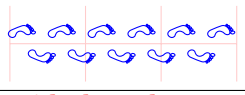
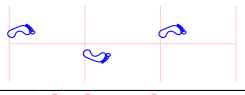
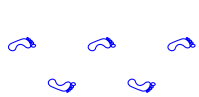
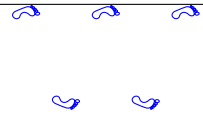
\fill[decorate,decoration={footprints,foot of = gnome}] (0,2.5) - - (3,2.5);

			
foot of = gnome	foot of = human	foot of = bird	foot of = felis silvestris

\fill[decorate,decoration={footprints,foot length=20pt}] (0,2.5) - - (3,2.5);

	
foot length=1cm	stride length=2cm
Par défaut : : 10pt	Par défaut : : 30pt
	
foot sep=1cm	foot angle = 45
Par défaut : : 4pt	Par défaut : : 10

\fill[decorate,decoration={footprints,foot length=20pt}] (0,2.5) - - (3,2.5);

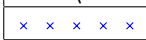
			
foot length=20pt	foot length=1cm	stride length=15pt	stride length=2cm
Par défaut : : foot length=10pt		Par défaut : : stride length=30pt	
			
foot sep=10pt	foot sep=1cm	foot angle = -45	foot angle = 45
Par défaut : : foot sep=4pt		Par défaut : : foot angle=10	

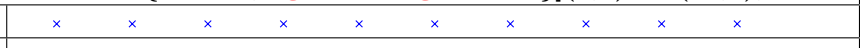
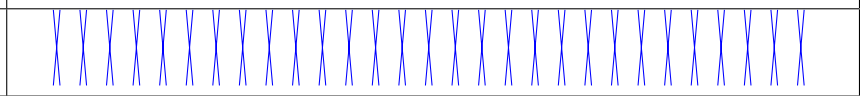
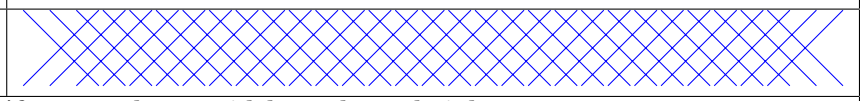
18.5 Library “decorations.shapes”

18.5.1 Introduction

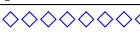
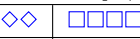
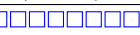
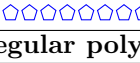
Charger l’extension: \usetikzlibrary{decorations.shapes}

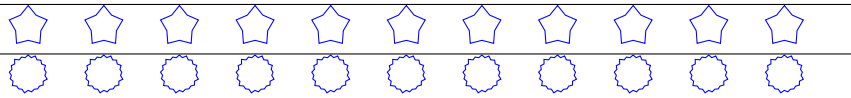
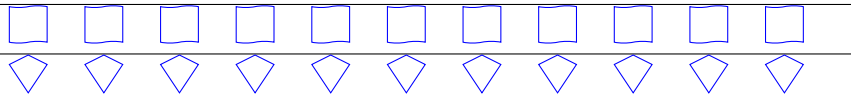
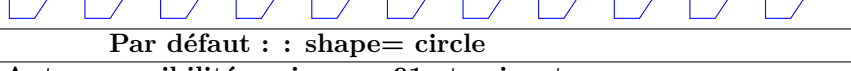
PGFmanual section : 48-5-3

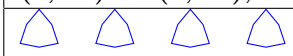
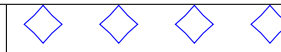
\draw[decorate,decoration=crosses] (0,0) - - (3,0);		
		
crosses	triangles	shape backgrounds

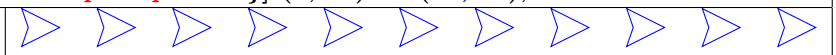
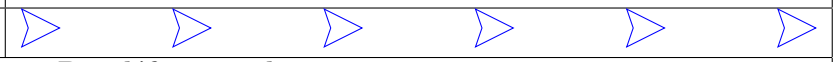
\draw[decorate,decoration={crosses,segment length=1cm}](0,0) - - (10,0);	
segment length = 1cm	
shape width = 1cm	
shape height = 1cm	
shape size = 1cm	
Par défaut : : shape width = shape height = 2.5pt	

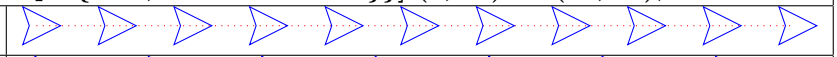
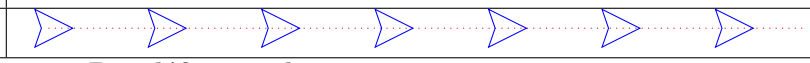
18.5.2 “shape backgrounds”

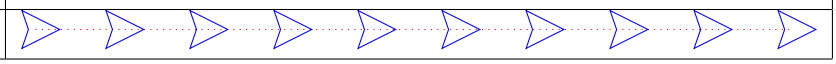
\draw[decorate with=dart] (0,2.5) - - (3,2.5);			
			
dart	diamond	rectangle	circle
			
star	regular polygon	signal	kite
Autres possibilités et paramètres voir page 91 et suivantes			

Formes disponibles	
Syntaxe	\draw[decorate,decoration={ shape backgrounds,shape=dart, shape size=.5cm,shape sep=1cm}] (0,0) - - (10,0);
Autre syntaxe	\draw[decorate with=dart,decoration={shape size=.5cm,shape sep=1cm}] (0,0) – (10,0);
dart	
rectangle	
cloud	
star	
starburst	
tape	
kite	
signal	
Par défaut : : shape= circle	
Autres possibilités voir page 91 et suivantes	

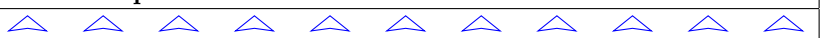
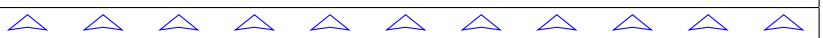
Paramètres			
\draw[decorate with=star,star points=3,decoration={shape size=.5cm,shape sep=1cm}] (0,2.5) - - (3,2.5);			
			
star points=3	star points=4	star points=5	star points=8
\draw[decorate with=star,paint=green,decoration={shape size=.5cm,shape sep=1cm}] (0,2.5) - - (3,2.5);			
			
paint=green	double	ultra thick	star point ratio = 3

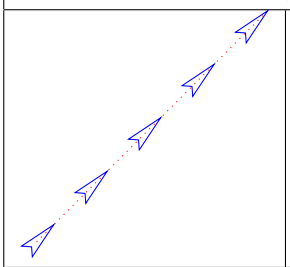
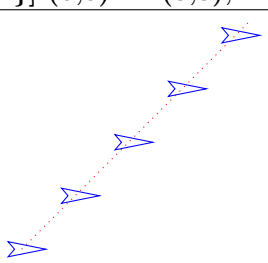
Espacement	
\draw[decorate with=dart,decoration={shape size=.5cm, shape sep=1cm}] (0,2.5) - - (10,2.5);	
shape sep={1cm}	
shape sep={2cm}	
Par défaut : : shape sep= 0.25cm	

Type d'espacement	
\draw[decorate with=dart,decoration={shape size=.5cm, shape sep={1cm,between centers}}] (0,2.5) - - (10,2.5);	
between centers	
between borders	
Par défaut : : between centers	

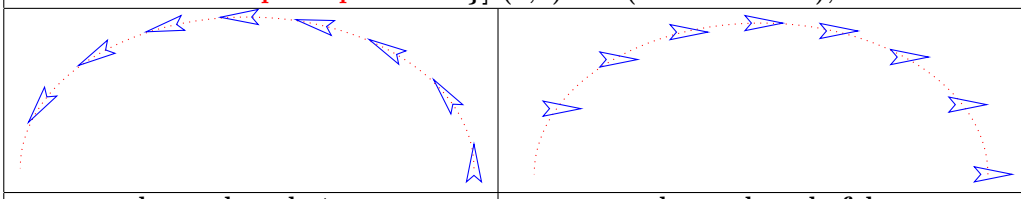
Espacement automatique	
\draw[decorate with=dart,decoration={shape size=.5cm, shape evenly spread=5}] (0,0) - - (10,0);	
shape evenly spread=5	
shape evenly spread=10	

Orientation :

” shape border rotate “	
shape border rotate=90	
shape border rotate=45	
shape border rotate=180	

“shape sloped”	
\draw[decorate with=dart,decoration={shape width=.5cm,shape sep=1cm, shape sloped=true }] (0,0) - - (3,3);	
	
shape sloped=true	shape sloped=false
Par défaut : : shape sloped=true	

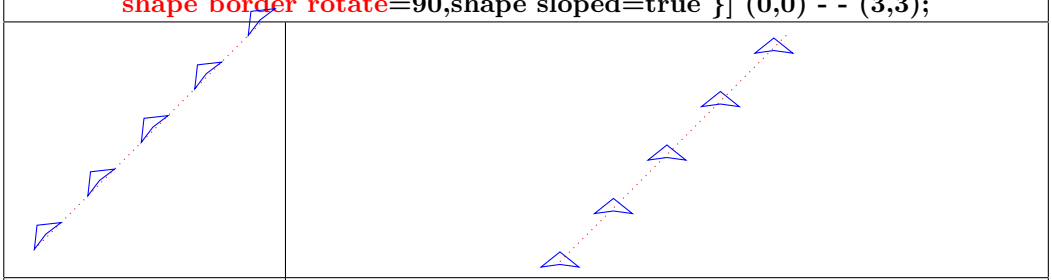
\draw[decorate with=dart,decoration={shape width=.5cm,shape sep=1cm, shape sloped=true}] (0,0) arc (0:180:3 and 2);



shape sloped=true	shape sloped=false

Par défaut : : shape sloped=true

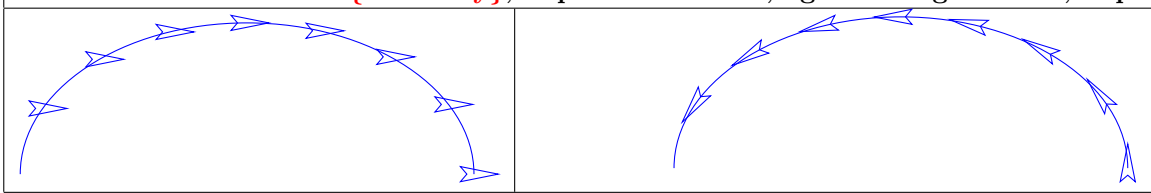
\draw[decorate with=dart,decoration={shape width=.5cm,shape sep=1cm, shape border rotate=90,shape sloped=true }] (0,0) - - (3,3);



shape sloped=true	shape sloped=false

“shift only”

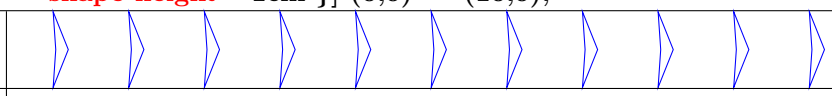
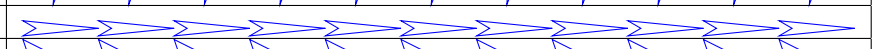
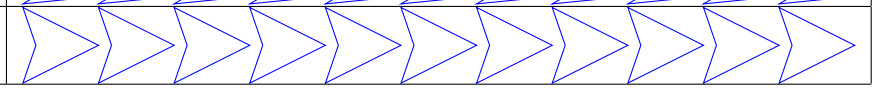
decoration= transform={shift only},shape width=5mm,segment length=.5cm,shape sep=1cm

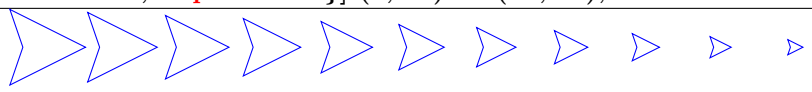
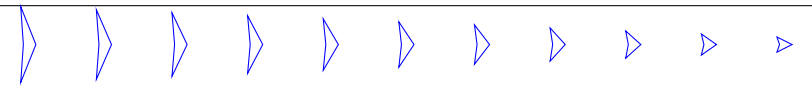
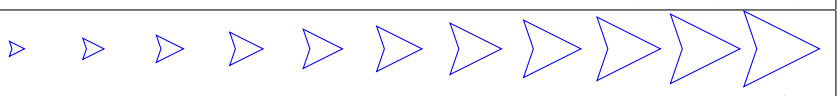
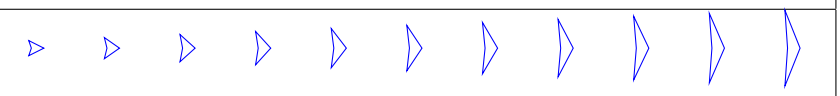


avec	sans

Dimensions

\draw[decorate with=dart,decoration={shape size=.5cm, shape height= 1cm }] (0,0) - - (10,0);

shape height=1cm	
shape width=1cm	
shape size=1cm	

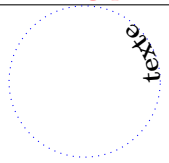
\draw[decorate with=dart,decoration={shape size=.5cm, shape start size=1cm,shape scaled }] (0,2.5) - - (10,2.5);	
shape start size=1cm	
shape start height=1cm	
shape start width=1cm	
shape end size=1cm	
shape end height=1cm	
shape end width=1cm	

18.6 Library “decorations.text”

Charger l’extension: \usetikzlibrary{decorations.text}

PGFmanual section : 48-6

\draw[decorate,decoration={text along path,text={texte}}] (1,1) circle (1);

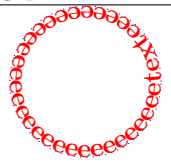
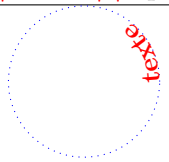


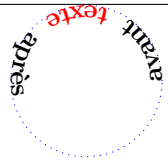
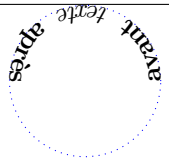
Texte trop long

\draw[decorate,decoration={text along path,
text={Un Deux Trois Quatre Cinq Six sept Huit Neuf Dix}}] (1,1) circle (1);

Format du texte

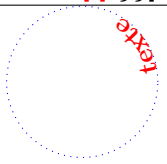
\draw [decorate,decoration={text along path, text=avant |\red | texte | | après }]

		
text={avant |\red|texte|| après }	text={ |\red|texte|| }	text={ |\red|texte|| {} }

		
avant | \red| texte || après	avant | \it| texte || après	avant | \Huge| texte || après

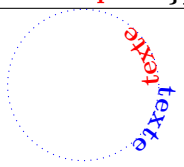
\draw [decorate,decoration={text along path,
text={avant |\Large|Visual |+\bf\color{red}|Tikz|| après }}] (1,1) circle (1);

\draw [decorate,decoration={text along path,text format delimiters={[}{]},
text={ [\red] texte [ ] }}] (1,1) circle (1);



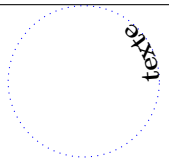
Sens du texte

```
\draw[decorate,decoration={text along path,text={texte},
text color=blue, reverse path }] (1,1) circle (1);
```

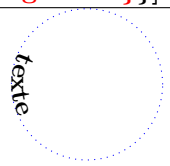


Position du texte

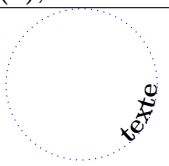
```
\draw[decorate,decoration={ text along path,text={texte},
text align={align=left}}] (1,1) circle (1);
```



align={align=left }

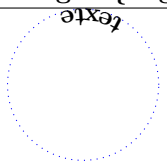


align={align=center }

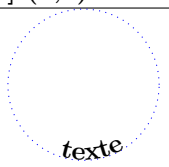


align={align=right }

```
\draw[ decorate,decoration={text along path,text={texte},
text align={align=left,left indent=1cm} } ] (1,1) circle (1);
```



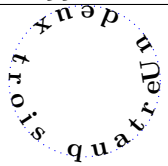
align={align=left,left indent=1cm}



align={align=right,right indent=1cm}

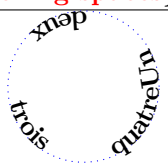
Justification du texte

```
\draw [decoration={text along path, text={Un deux trois quatre },
text align={fit to path}}, decorate] (1,1) circle (1);
```



Justification des espaces

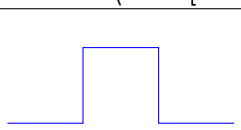
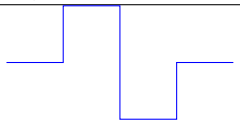
```
\draw [decoration={text along path, text={Un deux trois quatre },
text align={fit to path stretching spaces}}, decorate] (1,1) circle (1);
```

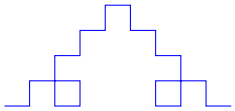
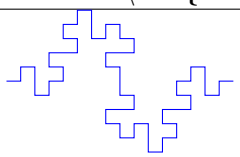


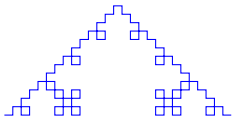
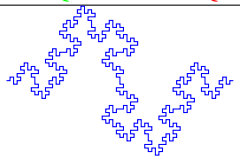
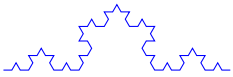
18.7 Library “decorations.fractals”

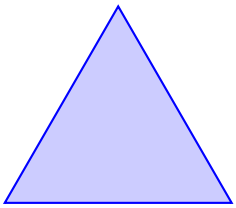
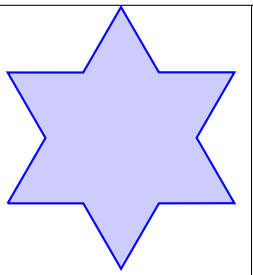
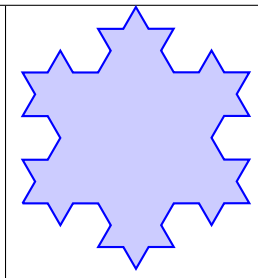
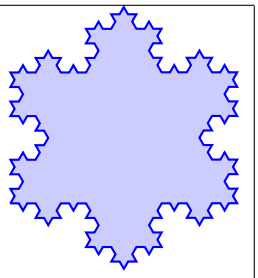
Charger l’extension: \usetikzlibrary{decorations.fractals}

PGFmanual section : 48-7

\draw[decorate,decoration=Koch curve type 1] (0,0) - - (3,0);			
			
Koch curve type 1	Koch curve type 2	Koch snowflake	Cantor set

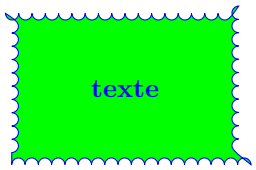
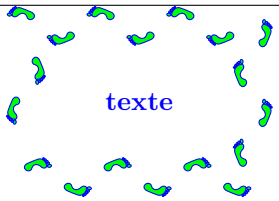
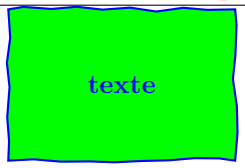
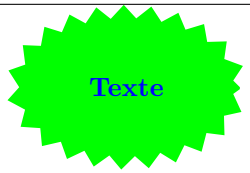
\begin{tikzpicture}[decoration=Koch curve type 1] \draw decorate { decorate { (0,0) – (3,0) }}; \end{tikzpicture}			
			
Koch curve type 1	Koch curve type 2	Koch snowflake	Cantor set

\draw decorate { decorate { decorate { (0,0) - - (3,0) } } };			
			
Koch curve type 1	Koch curve type 2	Koch snowflake	Cantor set

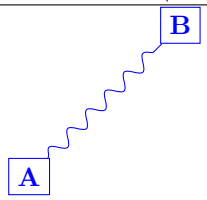
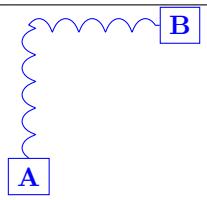
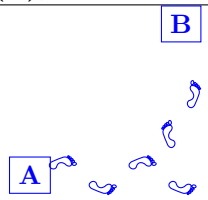
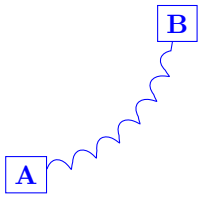
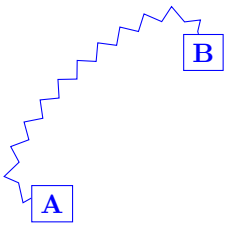
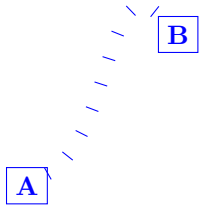
			
sans	1 decorate	2 decorate	3 decorate

18.8 Applications

18.8.1 Décoration d'un nœud

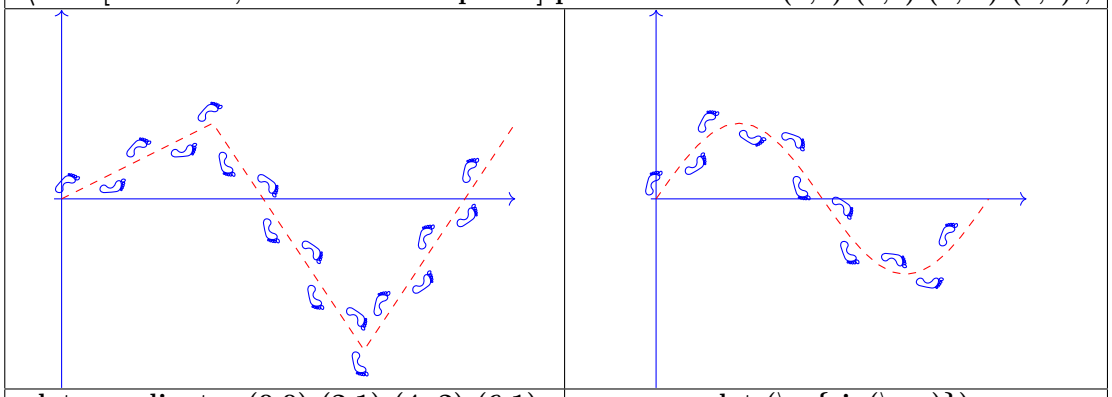
\node [draw,decorate,decoration={bumps, minimum height=2cm, minimum width=3cm}] {texte};	
	
decoration=bumps	decoration=footprints
	
decoration={random steps , amplitude = 1pt }	starburst,decoration={random steps, segment length=3pt , amplitude=2pt}
	
ellipse,decoration=zigzag	decoration= {text along path,text= {Un Deux Trois Quatre Cinq Six Sept Huit Neuf} }

18.8.2 Décoration de liaisons de noeuds

\draw [decorate,decoration=snake](A) – (B);		
		
decoration=snake (A)- - (B)	decoration=coil (A) |- (B)	decoration=footprints (A) -| (B)
		
decoration=coil (A) to [bend right] (B)	decoration=zigzag (A) to[bend left=120] (B)	decoration=ticks (A) to[out=30] (B)

18.8.3 Décoration d'un graphe

```
\draw[ decorate,decoration=footprints] plot coordinates (0,0) (2,1) (4,-2) (6,1) ;
```

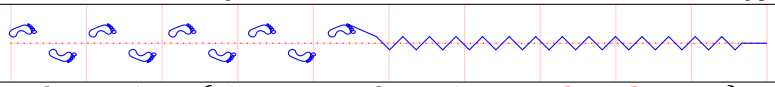


plot coordinates (0,0) (2,1) (4,-2) (6,1)

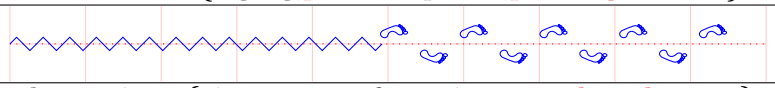
plot (\x,{sin(\x r)})

18.8.4 Décorations variables

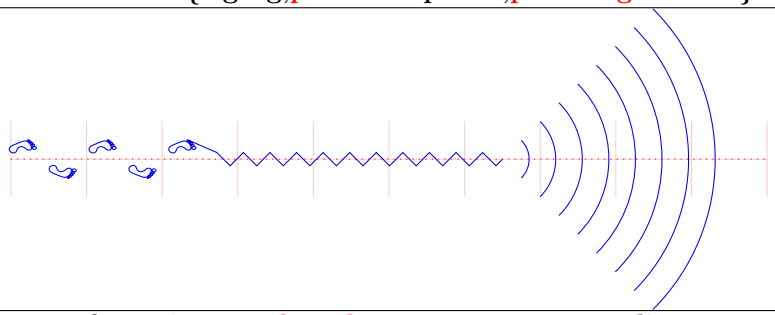
```
\draw [decorate, decoration={zigzag,pre=footprints,pre length=5cm}](0,0) – (10,0);
```



decoration={zigzag,pre=footprints,pre length=5cm}

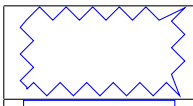


decoration={zigzag,post=footprints,post length=5cm}

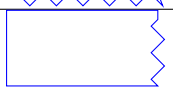


decoration={zigzag,pre=footprints,pre length=3cm, ,post=expanding waves,post length=3cm}

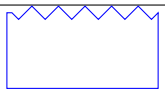
18.8.5 Décoration partielle



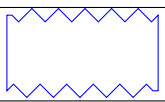
```
\draw [decorate,decoration=zigzag] (0,0) – (2,0) – (2,1) – (0,1)– cycle;
```



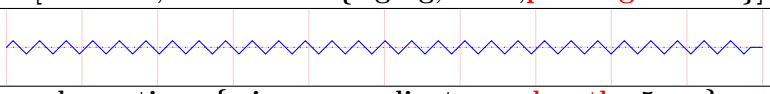
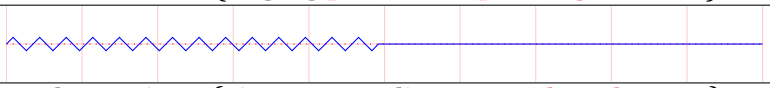
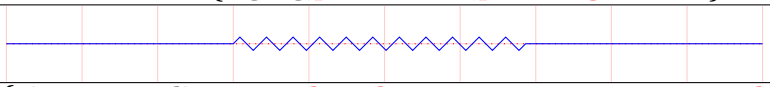
```
\draw [decoration=zigzag] (0,0) – (2,0) decorate{– (2,1)} – (0,1)– cycle;
```

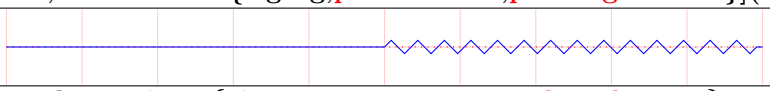
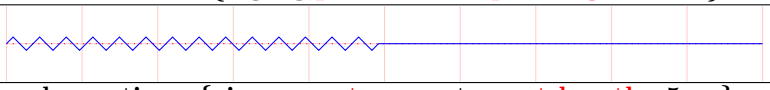
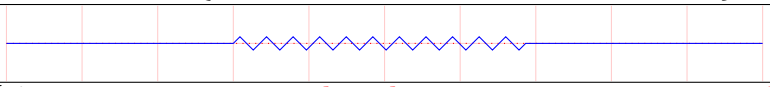


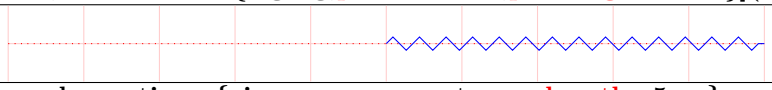
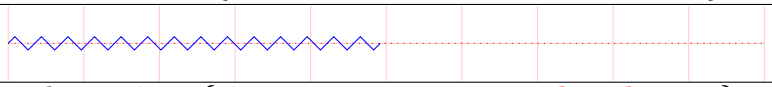
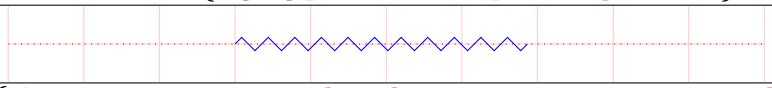
```
\draw [decorate,decoration=zigzag] (0,0) – (2,0) – (2,1) – decorate{(0,1)}– cycle;
```



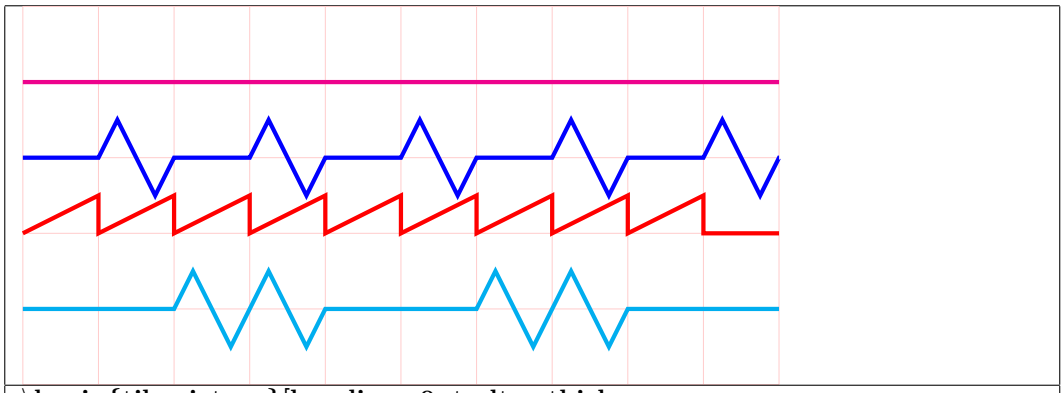
```
\draw [decorate,decoration=zigzag] (0,0) decorate{– (2,0)} – (2,1) – decorate{(0,1)}– cycle;
```

“lineto” \draw [decorate, decoration={zigzag,lineto,pre length=5cm}](0,0) – (10,0);

decoration={ zigzag,pre=lineto,pre length=5cm }

decoration={zigzag,post=lineto,post length=5cm}

decoration={zigzag,pre=lineto,pre length=3cm, ,post=curveto,post length=3cm}

“curveto”
\draw [decorate, decoration={zigzag,pre=curveto,pre length=5cm}](0,0) – (10,0);

decoration={zigzag,pre=curveto,pre length=5cm}

decoration={zigzag,post=curveto,post length=5cm}

decoration={zigzag,pre=curveto,pre length=3cm, ,post=curveto,post length=3cm}

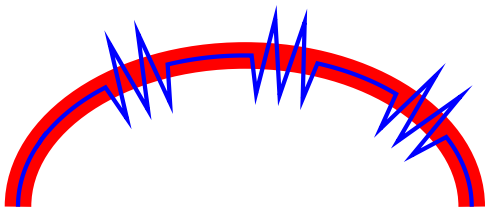
“moveto”
\draw [decorate, decoration={zigzag,pre=moveto,pre length=5cm}](0,0) – (10,0);

decoration={zigzag,pre=moveto,pre length=5cm}

decoration={zigzag,post=moveto,post length=5cm}

decoration={zigzag,pre=moveto,pre length=3cm, ,post=moveto,post length=3cm}

18.8.6 Paramètres globaux ou particuliers



```
\begin{tikzpicture}[baseline=0pt,ultra thick,
decoration={straight zigzag,amplitude=0.5cm,segment length=1cm}]
\draw[red!20,ultra thin] (0,-2) grid (10,3);
\draw[magenta] (0,2) -- (10,2);
\draw[blue,decorate] (0,1) -- (10,1);
\draw[red,{decorate,decoration=saw}] (0,0) -- (10,0);
\draw[cyan,decorate,decoration=meta-segment length=2cm] (0,-1) -- (10,-1);
\end{tikzpicture}
```

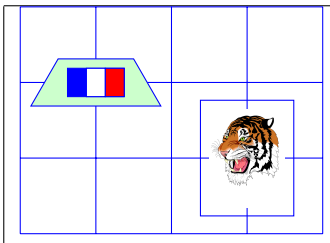
18.8.7 Tracer le chemin et sa décoration avec “Postaction”



```
\draw [postaction={decorate,blue,draw,ultra thick,
decoration={straight zigzag,amplitude=0.5cm}}]

[red,line width = 10pt ] (0,0) arc (0:180:3 and 2);
```

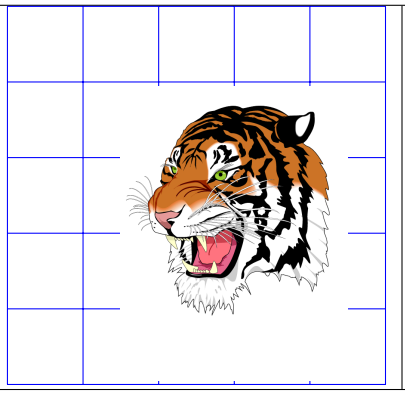
19 Insertion images dans un environnement TikZ

19.0.1 Dans un noeud



```
\begin{tikzpicture}
\draw (0,0) grid (5,3);
\node [fill=green!20,trapezium,draw] at (1,2) {\DFR };
88
\node [draw] at (3,1) {\includegraph-
ics[width=1cm]{tiger} };
\end{tikzpicture}
```

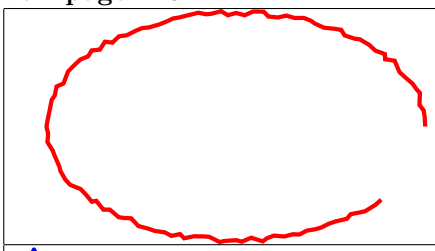
19.0.2 En déclarant l'image dans pgf



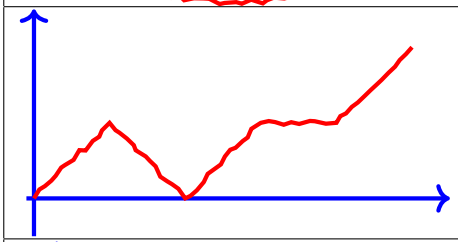
```
\pgfdeclareimage[width=3cm]{ttt}{tiger}

\begin{tikzpicture}
\draw (0,0) grid (5,5);
\draw (3,2) node {\pgfuseimage{ttt}} ;
\end{tikzpicture}
```

20 Trait à main levée

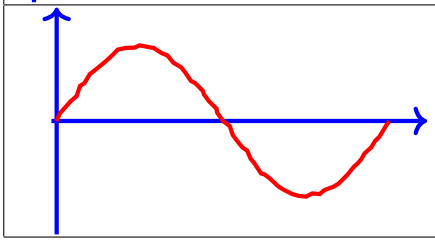
voir page 115



```
\draw[decorate,decoration={random steps,
amplitude=1pt,segment length=3pt}] (0,0)
arc (0:320:2.5 and 1.5);
```



```
\draw[decorate,decoration={random steps,
amplitude=1pt,segment length=3pt}] plot
coordinates (0,0) (1,1) (2,0) (3,1) (4,1) (5,2);
```



```
\draw[decorate, decoration={random steps,
amplitude=1pt,segment length=3pt}] plot
(\x,sin(\x r));
```

21 Effets spéciaux

21.1 Le peuple TikZ

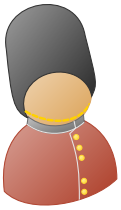
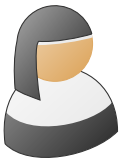
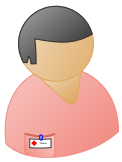
Charger l'extension: \usepackage{tikzpeople} [4] [a]

[a] conflit \usetikzlibrary{patterns} page 17 : placer cette commande en premier

\tikz \node[alice] at (0,0) ;	

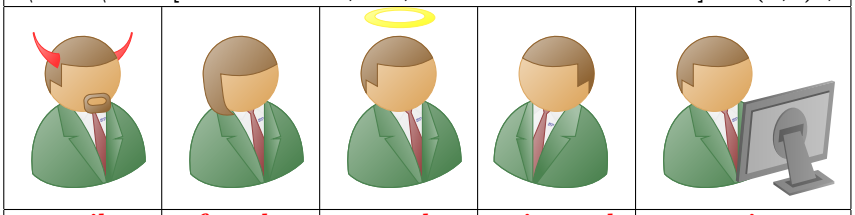
21.1.1 Personages disponibles

\tikz \node[alice,minimum size=1.5cm] at (0,0) ;

						
alice	bob	bride	builder	businessman	charlie	chef
						
conductor	cowboy	criminal	dave	graduate	groom	guard
						
jester	judge	mexican	nun	nurse	physician	pilot
						
police	priest	sailor	santa	surgeon		

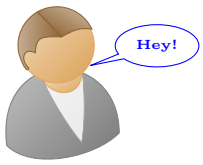
21.1.2 Options

\tikz \node[businessman,evil,minimum size=1.5cm] at (0,0) ;



evil | female | good | mirrored | monitor

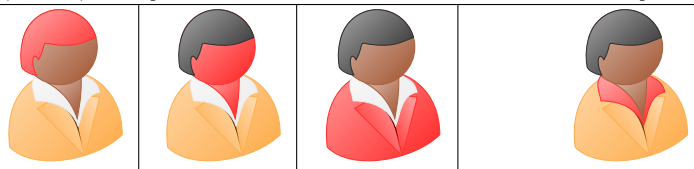
21.1.3 Point d'ancrage spécifique




```
\begin{tikzpicture}[blue]
\node[name=a,shape=bob,minimum size=1.5cm] {};
\node at (1.25,.5) [ellipse callout, draw, callout absolute pointer{(a.mouth)}, font=\tiny] Hey!;
\end{tikzpicture}
```

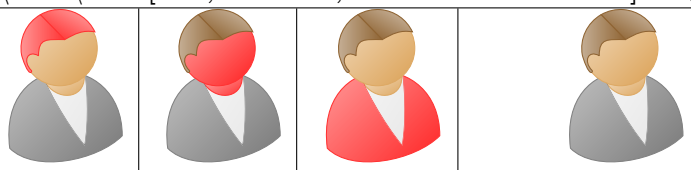
21.1.4 Couleurs

\tikz \node[alice,hair=red,minimum size=1.5cm] at (0,0) ;



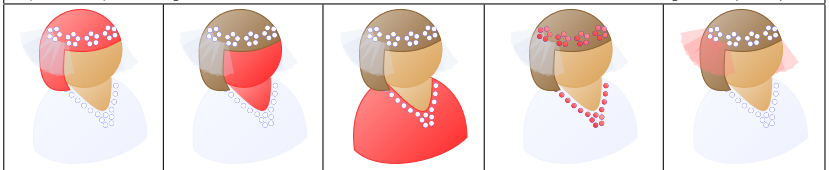
hair=red | skin=red | shirt=red | details=red

\tikz \node[bob,hair=red,minimum size=1.5cm] at (0,0) ;



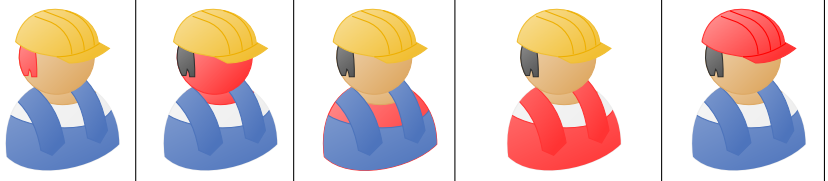
hair=red | skin=red | shirt=red | details=red

\tikz \node[bride,hair=red,minimum size=1.5cm] at (0,0) ;



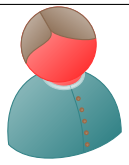
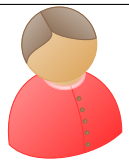
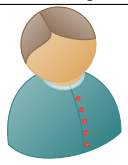
hair=red | skin=red | shirt=red | pearls=red | veil=red

\tikz \node[builder,hair=red,minimum size=1.5cm] at (0,0) ;



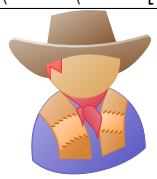
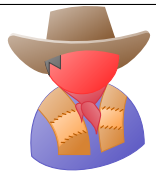
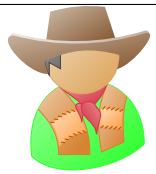
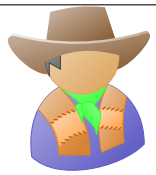
hair=red | skin=red | shirt=red | trousers=red | hat=red

\tikz \node[businessman,hair=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=red	tie=red	undershirt=red	monogram=red

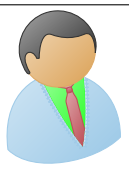
\tikz \node[charlie,hair=red,minimum size=1.5cm] at (0,0) ;			
			
hair=red	skin=red	shirt=red	buttons=red

\tikz \node[chef,hair=red,minimum size=1.5cm] at (0,0) ;				
				
hair=red	skin=red	shirt=red	hat=red	details=red

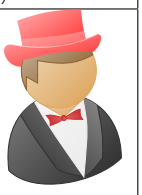
\tikz \node[conductor,hair=red,minimum size=1.5cm] at (0,0) ;				
				
hair=red	skin=red	shirt=red	hat=red	hatshield=red
				
undershirt=red	shirt=red	hatbadge=red	badge=red	

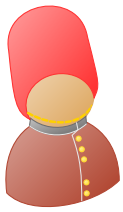
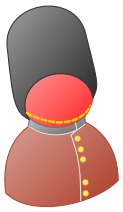
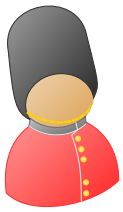
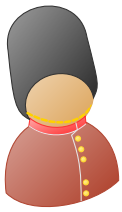
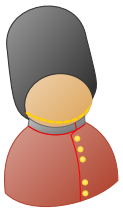
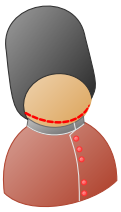
\tikz \node[cowboy,hair=red,minimum size=1.5cm] at (0,0) ;			
			
hair=red	skin=red	shirt=green	hat=red
			
patches=red	tie=green	stitching=red	vest=red

\tikz \node[criminal,hat=red,minimum size=1.5cm] at (0,0) ;			
			
hat=red	skin=red	shirt=red	details=red

\tikz \node[dave,hair=red,minimum size=1.5cm] at (0,0) ;				
				
hair=red	skin=red	shirt=red	undershirt=green	tie=green

\tikz \node[graduate,hair=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=red	undershirt=red	stripes=red	hat=red

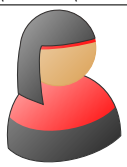
\tikz \node[groom,hair=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=red	undershirt=green	tie=green	hat=red

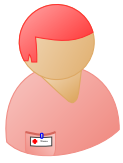
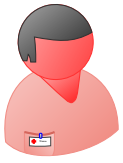
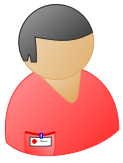
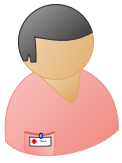
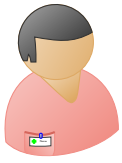
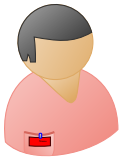
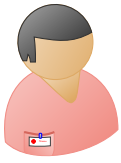
\tikz \node[guard,hat=red,minimum size=1.5cm] at (0,0) ;					
					
hat=red	skin=red	shirt=red	collar=red	lining=red	details=red

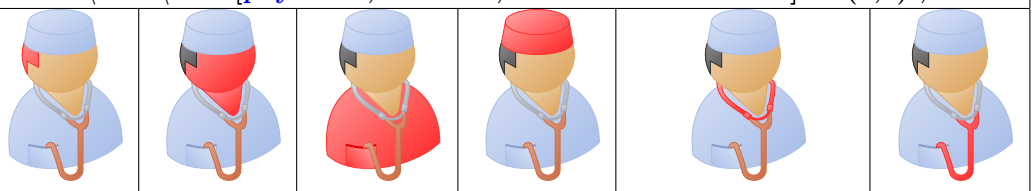
\tikz \node[jester,hat=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=yellow	hat=red	pattern=yellow [2]	details=blue

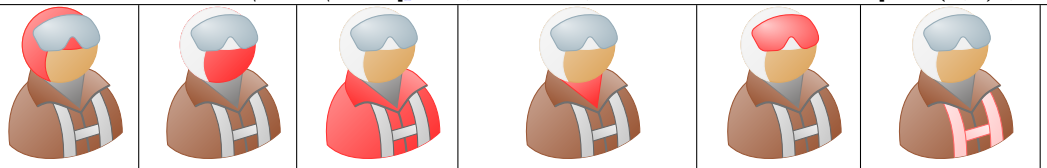
\tikz \node[judge,hair=red,minimum size=1.5cm] at (0,0) ;				
hair=red	skin=red	shirt=red	undershirt=red	hairshadow=red

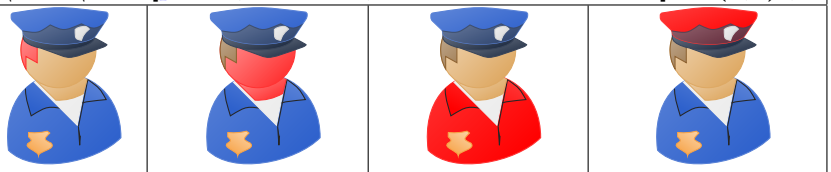
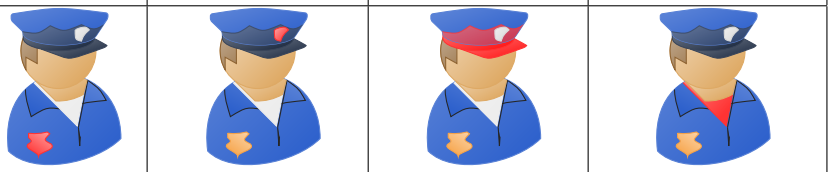
\tikz \node[mexican,hair=red,minimum size=1.5cm] at (0,0) ;						
						
hair=red	skin=red	shirt=red	hat=green	ringtop=red	ringmid=red	ringbot=yellow

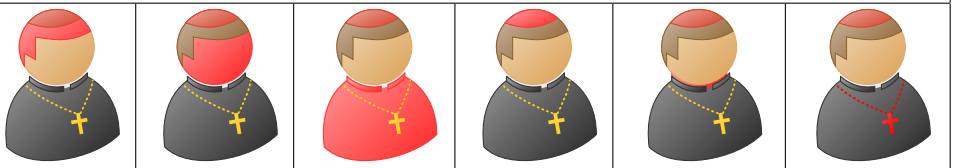
\tikz \node[nun,plaid=red,minimum size=1.5cm] at (0,0) ;		
		
plaid=red	skin=red	shirt=red

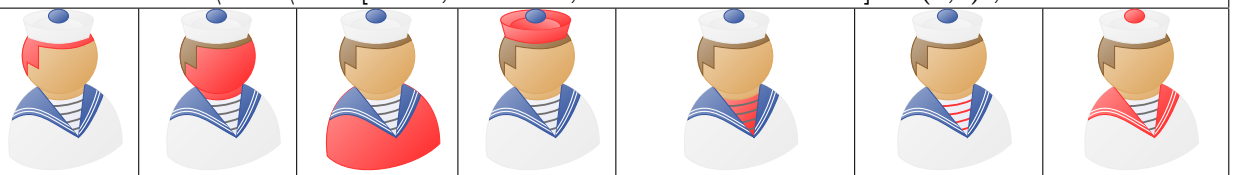
\tikz \node[nurse,hair=red,minimum size=1.5cm] at (0,0) ;						
						
hair=red	skin=red	shirt=red	badgeclip=green	redcross=green	badge=red	badgename=red

\tikz \node[physician,hair=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=red	hat=red	stethoscope=red	tube=red

\tikz \node[pilot,hat=red,minimum size=1.5cm] at (0,0) ;						
						
hat=red	skin=red	shirt=red	undershirt=red	visor=red	straps=red	decoration=red

\tikz \node[police,hair=red,minimum size=1.5cm] at (0,0) ;			
			
hair=red	skin=red	shirt=red	hat=red
			
badge=red	hatbadge=red	hatshield=red	undershirt=red

\tikz \node[priest,hair=red,minimum size=1.5cm] at (0,0) ;					
					
hair=red	skin=red	shirt=red	hat=red	collar=red	cross=red

\tikz \node[sailor,hair=red,minimum size=1.5cm] at (0,0) ;						
						
hair=red	skin=red	shirt=red	hat=red	undershirt=red	stripes=red	details=red

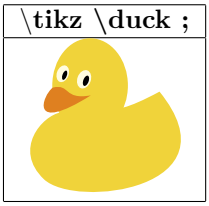
\tikz \node[santa,hat=green,minimum size=1.5cm] at (0,0) ;				
				
hat=green	skin=green	shirt=green	beard=green	details=green

\tikz \node[surgeon,hat=red,minimum size=1.5cm] at (0,0) ;				
				
hat=red	skin=red	shirt=red	hair=red	mask=red

21.2 Ducks

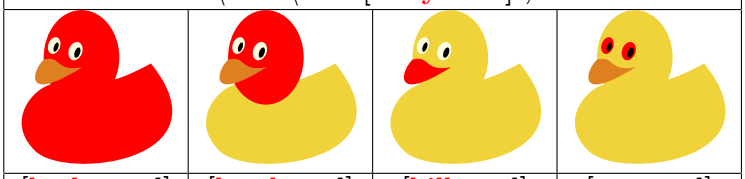
Charger l'extension: \usepackage{tikzducks} [5]

\tikz \duck ;



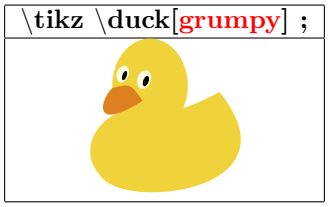
21.2.1 Options

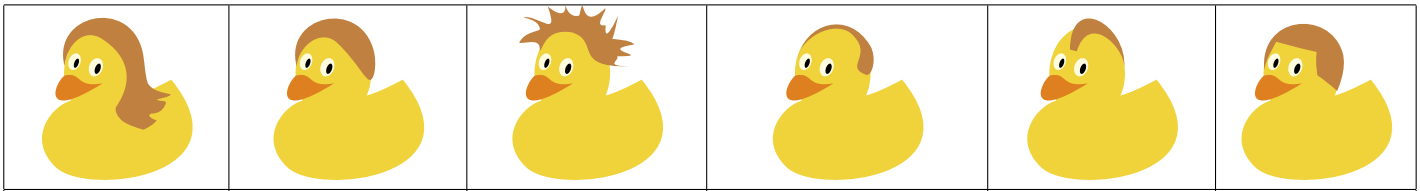
\tikz \duck[body=red] ;



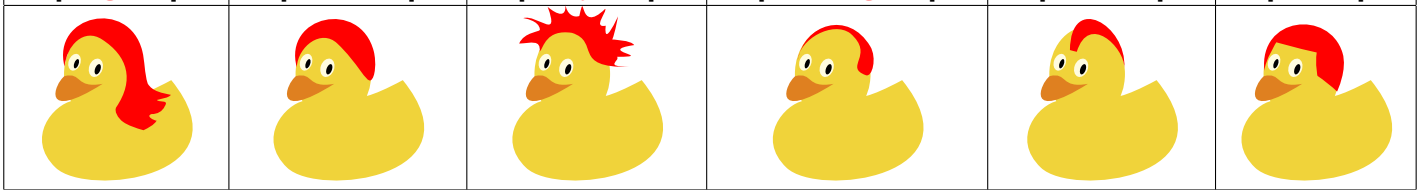
[body=red] [head=red] [bill=red] [eye=red]

\tikz \duck[grumpy] ;

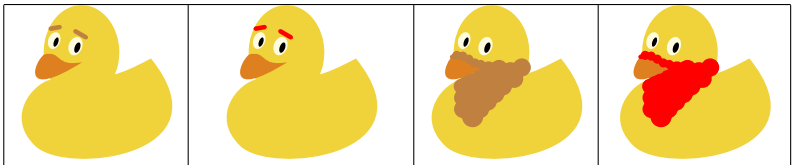




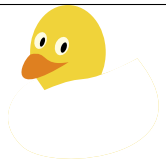
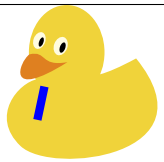
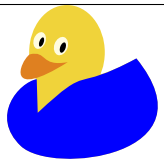
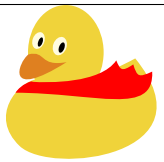
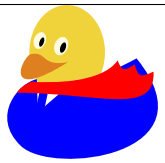
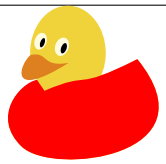
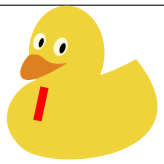
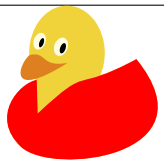
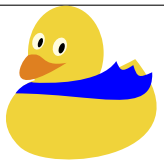
[longhair] [shorthair] [crazyhair] [recedinghair] [mohican] [mullet]

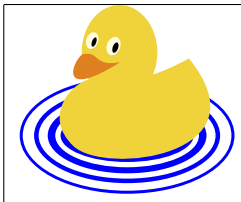
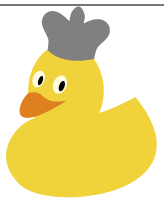
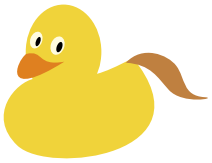
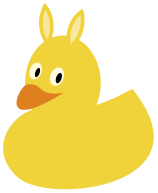
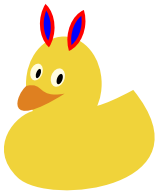
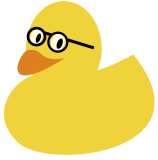


[longhair=red] [shorthair=red] [crazyhair=red] [recedinghair=red] [mohican=red] [mullet=red]



[eyebrow] [eyebrow=red] [beard] [beard=red]

				
[tshirt]	[tie]	[jacket]	[cape]	[tshirt,tie ,jacket ,cape]
Par défaut : white	Par défaut : blue	Par défaut : blue	Par défaut : red	
				
[tshirt=red]	[tie=red]	[jacket=red]	[cape=blue]	

				
[water]	[alien]	[hat]	[tophat]	[cap]
				
[santa]	[graduate]	[graduate,tassel]	[beret]	[peakedcap]
				
[crown]	[queencrown]	[kingcrown]	[sheep]	[horsetail]
				
[crozier]	[unicorn]	[bunny]	[bunny=red,inear=blue]	[witch]
				
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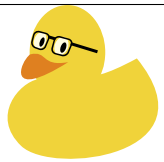		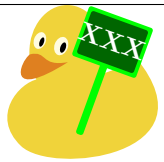	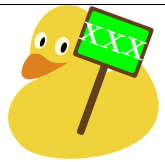	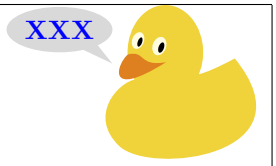
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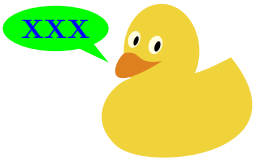	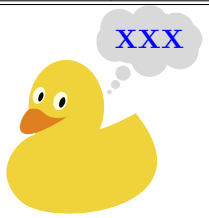	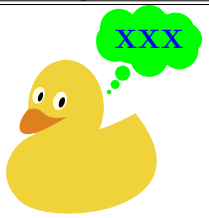	
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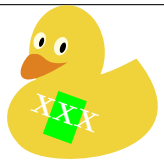
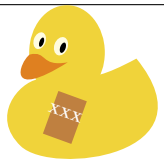
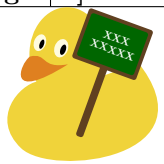
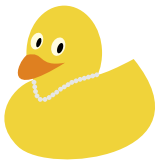
			
[book=XXX, bookcolour=green]	\tikz \duck[book= \scalebox{0.5}{XXX}]	\tikz \duck[signpost=\scalebox{0.4}{ \parbox{2cm} \centering XXX ; XXXXX}]	

				
[cricket]	[hockey]	[football]	[lightsaber]	[torch]
				
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				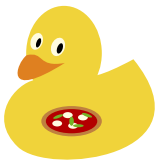
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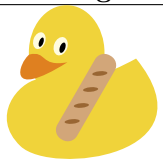			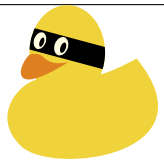	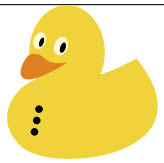
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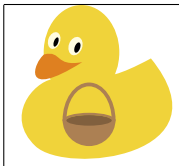
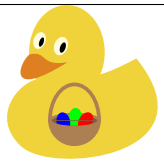
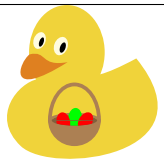
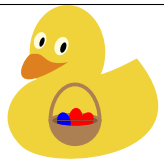
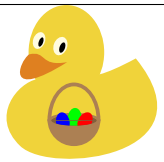
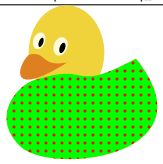
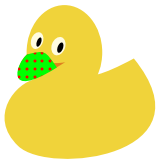
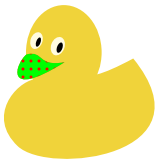
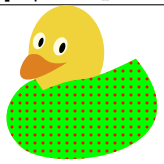
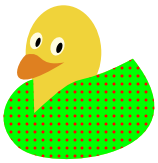
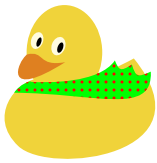
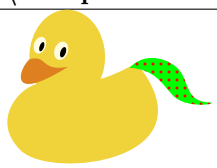
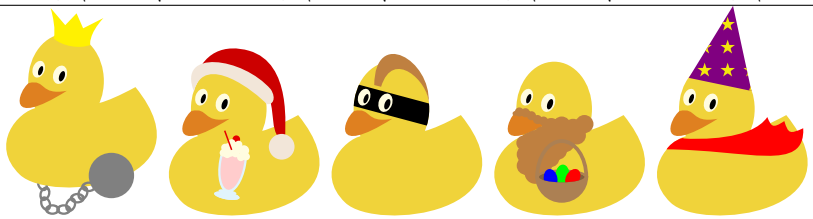
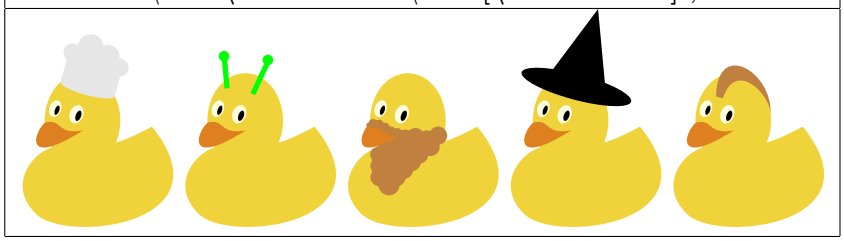
				
[basket]	[easter]	[easter,egga=red]	[easter,eggb=red]	[easter,eggc=red]

\tikz \duck \path[preaction={fill,green},pattern=dots, pattern color=red] \duckpathbody ;			
			
\duckpathbody	\duckpathgrumpybill	\duckpathbill	\duckpathtshirt
			
\duckpathjacket	\duckpathcape	\duckpathshorthair	\duckpathlonghair
			
\duckpathcrazyhair	\duckpathrecedinghair	\duckpathcrown	\duckpathmohican
			
\duckpathmullet	\duckpathqueencrown	\duckpathkingcrown	\duckpathdarthvader
			
\duckpathhorsetail			

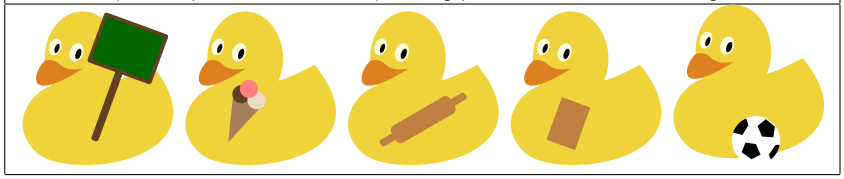
21.2.2 Canards aléatoires

\tikz \randuck ; \tikz \randuck ; \tikz \randuck ; \tikz \randuck ; \tikz \randuck ;


```
\tikz \shuffleducks \duck[\randomhead] ;
```

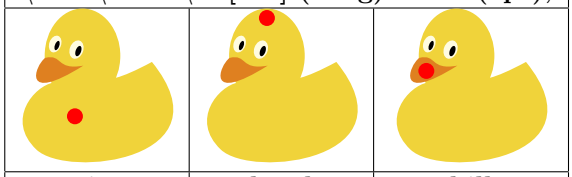


```
\tikz \shuffleducks \duck[\randomaccessories] ;
```



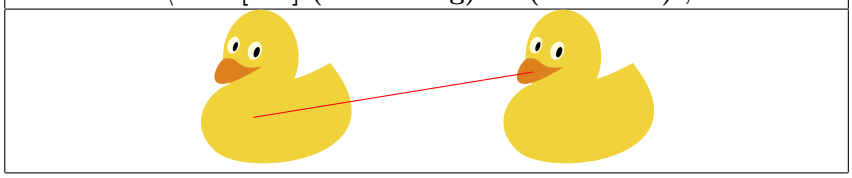
21.2.3 Coordonnées

```
\tikz \duck \fill[red] (wing) circle (3pt);
```

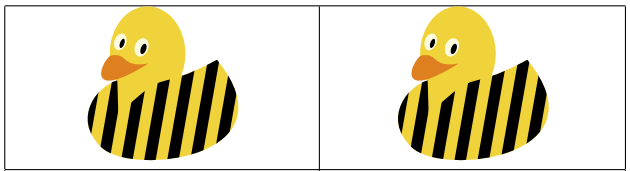


wing	head	bill

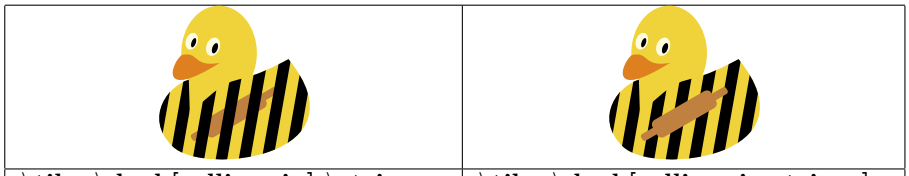
```
\tikz \duck[name=XXX]
\begin{scope} [xshift=4cm] \duck[name=YYY] \end{scope}
\draw[red] (XXX-wing) - - (YYY-bill) ;
```



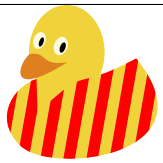
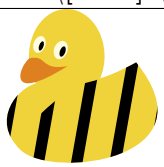
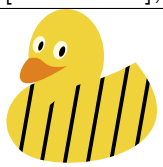
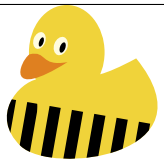
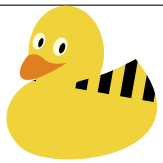
21.2.4 Rayures

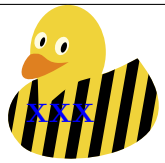
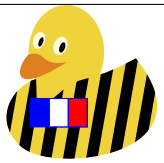


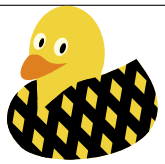
\tikz \duck \stripes ;	\tikz \duck[stripes] ;



\tikz \duck[rollingpin] \stripes ;	\tikz \duck[rollingpin,stripes] ;

\tikz \[duck] \stripes[color=red];			
			
[color=red]	[distance=.5]	[width=.05]	[height=1]
Par défaut : black	Par défaut : 0.3	Par défaut : 0.15	Par défaut : 2.7
			
[rotate=45]	[initialx=1]	[initialy=1]	
Par défaut : -10	Par défaut : 0.1	Par défaut : -0.3	

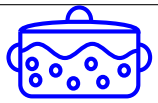
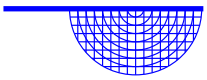
\tikz \[duck] \stripes[emblem=XXX];		
		
[emblem=XXX]	[emblem={\includegraphics [width=6mm]{LogoIUT} }]	[emblem={\DFR}]
		\DFR : voir page 88


\tikz \duck[stripes={ \stripes \stripes[rotate=45] }] ;

21.3 symbol

Charger l'extension: \usepackage{tikzsymbols} [6]

☺		
\Smiley	\Smiley[3]	\Smiley[5][green]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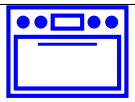
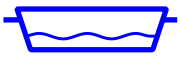
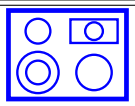
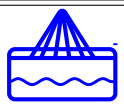
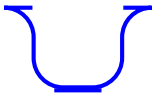
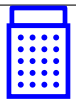
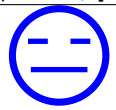
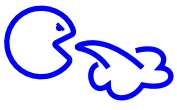
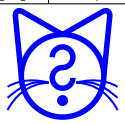
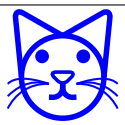
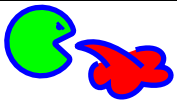
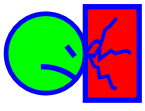
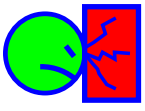
	\pot[5]	\fryingpan[5]	\eggbeater[5]	\sieve[5]
				
	\Purierstab[5]	\Dreizack[5]	\Backblech[5]	\Ofen[5]
	\blender[5]	\trident[5]	\bakingplate[5]	\oven[5]
				
	\Pfanne[5]	\Herd[5]	\Saftpresse[5]	\Schussel[5]
	\pan[5]	\cooker[5]	\squeezer[5]	\bowl[5]
				
	\Schaler[5]	\Reibe[5]	\Flasche[5]	\Nudelholz[5]
	\peeler[5]	\grater[5]	\bottle[5]	\rollingpin[5]

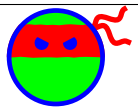
				
\Smiley[5]	\Sadey[5]	\Neutrey[5]	\Changey[5]{0}	\cChangey[5]{0}
				
\Annoey[5]	\Laughey[5]	\Winkey[5]	\oldWinkey[5]	\Sey[5]
				
\Xey[5]	\Innocey[5]	\wInnocey[5]	\Cooley[5]	\Tongey[5]
				
\Nursey[5]	\Vomey[5]	\Walley[5] \rWalley[5]	\Cat[5]	
				
\SchrodingersCat[5]{0}	\Ninja[5]	\Sleepey[5]	\NiceReapey[5]	

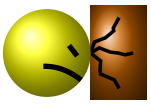
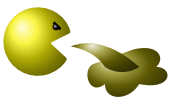
				
\Changey[5]{-2}	\Changey[5]{-1}	\Changey[5]{0}	\Changey[5]{1}	\Changey[5]{2}

				
\cChangey[5]{-2}	\cChangey[5]{-1}	\cChangey[5]{0}	\cChangey[5]{1}	\cChangey[5]{2}

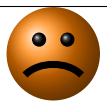
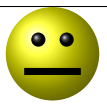
		
\SchrodingersCat[5]{-1}	\SchrodingersCat[5]{0}	\SchrodingersCat[5]{1}

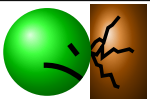
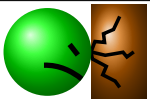
			
\Laughey[5][green][red]	\Innocey[5][green][red]	\Tongey[5][green][red]	\Nursey[5][green][red]
			
\Vomey[5][green][red]	\Walley[5][green][red]	\rWalley[5][green][red]	

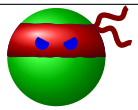
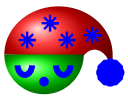
	
\Ninja[5][green][red][blue]	\Sleepey[5][green][red][blue]

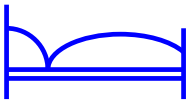
				
\dSmiley[5]	\dSadey[5]	\dNeutrey[5]	\dChangey[5]{0}	\dcChangey[5]{0}
				
\dAnnoey[5]	\dLaughey[5]	\dWinkey[5]	\dSey[5]	\dXey[5]
				
\dInnocey[5]	\dCooley[5]	\dNinja[5]	\drWalley[5]	\dWalley[5]
				
\dVomey[5]	\dNursey[5]	\dTongey[5]	\dSleepey[5]	\olddWinkey[5]

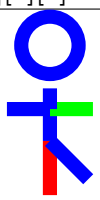
				
\dChangey[5]{-2}	\dChangey[5]{-1}	\dChangey[5]{0}	\dChangey[5]{1}	\dChangey[5]{2}

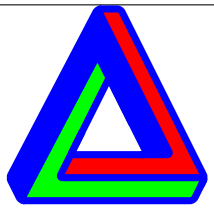
				
\dcChangey[5]{-2}	\dcChangey[5]{-1}	\dcChangey[5]{0}	\dcChangey[5]{1}	\dcChangey[5]{2}

			
\dLaughey[5][green][red]	\dInnocey[5][green][red]	\dTongey[5][green][red]	\dNursey[5][green][red]
	 [red]	 [red]	
\dVomey[5][green][red]	\dWalley[5][green][red]	\drWalley[5][green][red]	

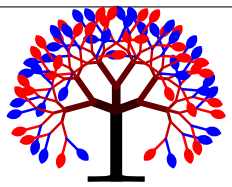
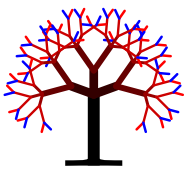
	
\dNinja[5][green][red][blue]	\dSleepey[5][green][red][blue]

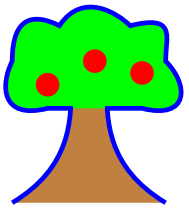
				
\Strichmaxerl[5]	\Candle[5]	\Fire[5]	\Coffeecup[5]	\Chair[5]
				
\Bed[5]	\Tribar[5]	\Moai[5]	\Snowman[5]	

\Strichmaxerl[10][0][0][0][0]				
				
[0][0][0][0]	[45][0][0][0]	[0][45][0][0]	[0][0][45][0]	[0][0][0][-45]



\Tribar[10][green][red][blue]

	
\BasicTree[10]{black}{red}{blue}{leaf}	\BasicTree[10]{black}{red}{blue}{}

				
\Springtree[10]	\Summertree[10]	\Autumntree[10]	\Wintertree[10]	\WorstTree[10]

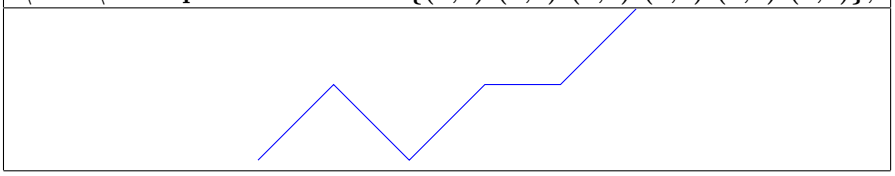
22 Créer un graphe

22.1 Graphe avec TikZ

22.1.1 Graphe à partir d'une liste de points

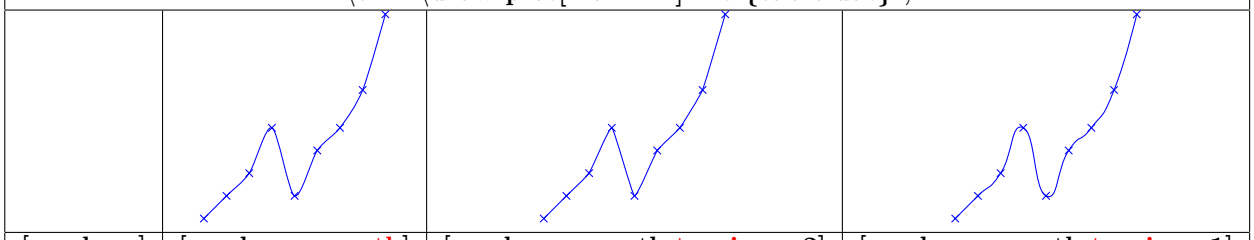
PGFmanual section : 22-2

```
\tikz \draw plot coordinates {(0,0) (1,1) (2,0) (3,1) (4,1) (5,2)};
```



22.1.2 Graphe à partir partir d'un fichier de données

```
\tikz \draw plot[mark=x] file {table.dat} ;
```



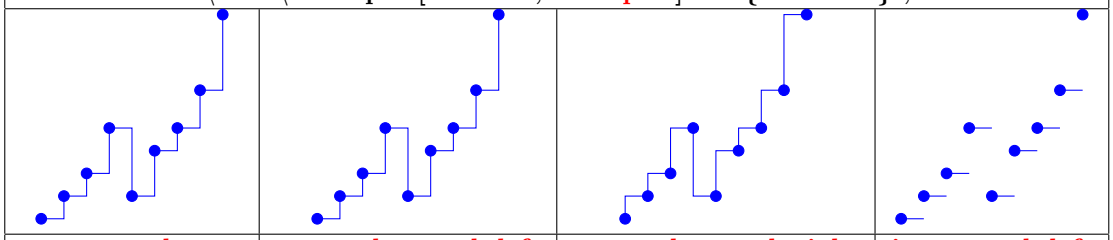
[mark=x]	[mark=x,smooth]	[mark=x,smooth,tension=.2]	[mark=x,smooth,tension=1]

Par défaut : : tension= 0:55

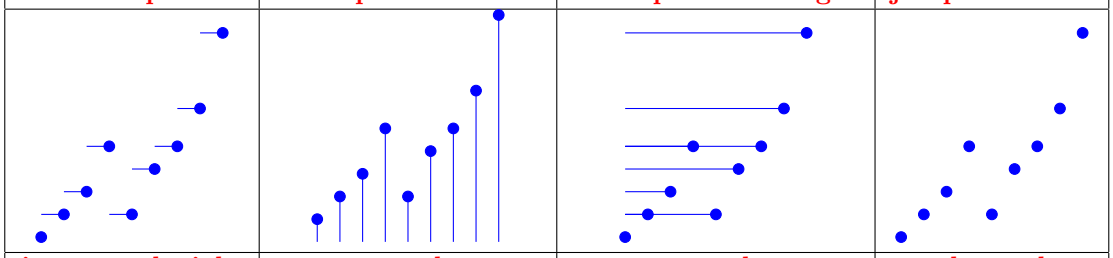
Contenu du fichier table.dat	
0.0	0.3
0.3	0.6
0.6	0.9
0.9	1.5
1.2	0.6
1.5	1.2
1.8	1.5
2.1	2.0
2.4	3.0

22.1.3 Les types de graphes

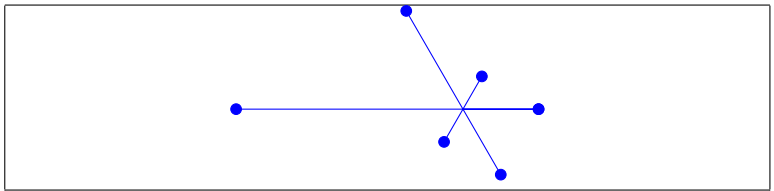
\tikz \draw plot[mark=*,const plot] file {table.dat} ;



const plot | const plot mark left | const plot mark right | jump mark left

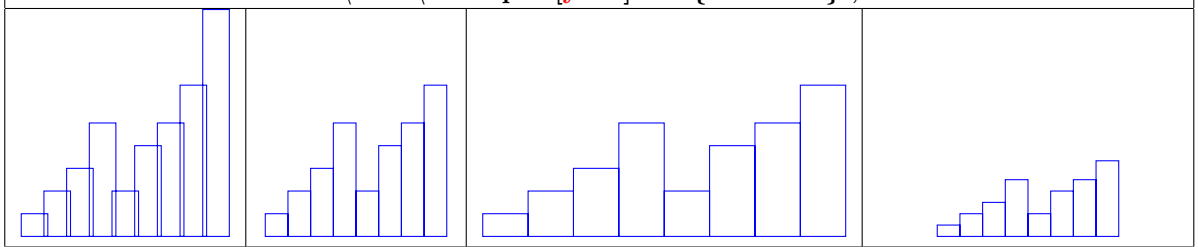


jump mark right | ycomb | xcomb | only marks

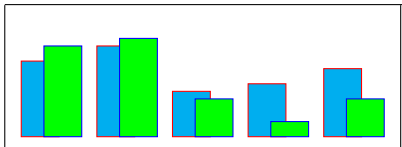


\tikz \draw plot[polar comb,mark=*]coordinates
{(0:1) (60:0.5) (120:1.5) (180:3) (240:.5) (300:1) (0:1)};

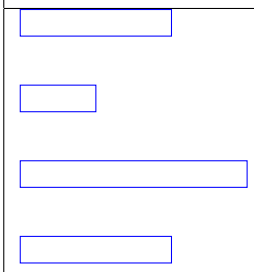
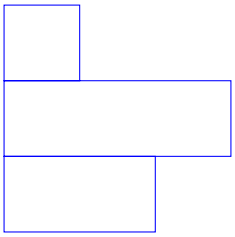
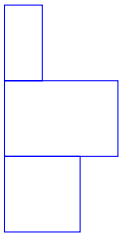
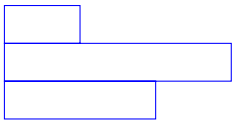
\tikz \draw plot[ybar] file {table.dat} ;



[ybar] | [ybar interval] | [ybar interval,x=2cm] | [ybar interval,y=.5cm]

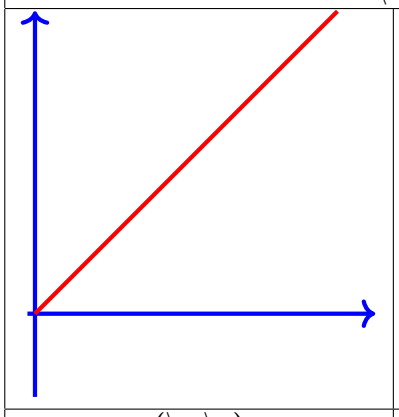


```
\begin{tikzpicture}
\draw[red,fill=cyan,ybar,bar width=.5cm]
        plot coordinates {(0,1) (1,1.2) (2,.6) (3,.7) (4,.9)};
\draw[blue,fill=green,ybar,bar width=.5cm,bar shift=.3cm]
        plot coordinates {(0,1.2) (1,1.3) (2,.5) (3,.2) (4,.5)};
\end{tikzpicture}
```

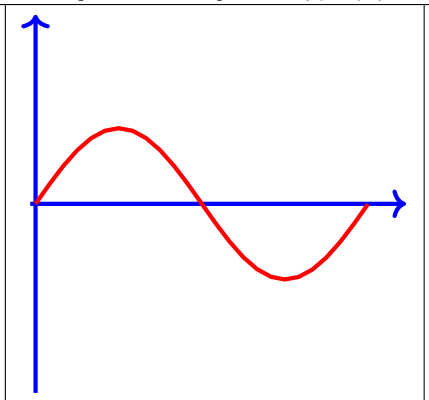
\tikz \draw plot[xbar interval] file {table.dat} ;			
			
[xbar]	[xbar interval]	[xbar interval,x=.5cm]	[xbar interval,y=.5cm]

22.1.4 Graphe à partir d'une fonction

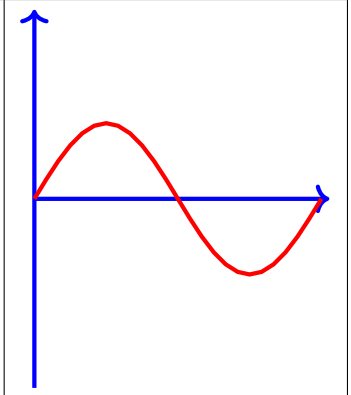
```
\draw [color=red] plot (\x,\x);
```



(\x,\x)



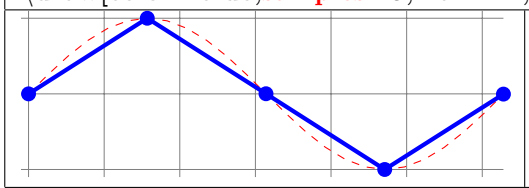
(\x,{sin(\x r)})
x en radian



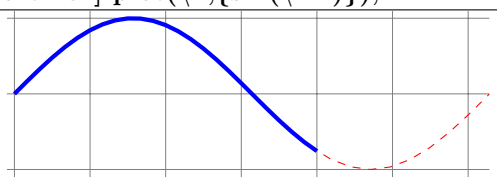
(\x,{sin(\x)})
x en degré

Options

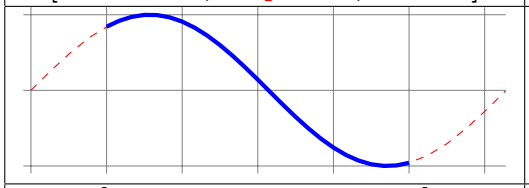
```
\draw[color=red,dashed] plot(\x,{sin(\x r)});
\draw[color=blue,samples=5,mark=*,ultra thick] plot(\x,{sin(\x r)});
```



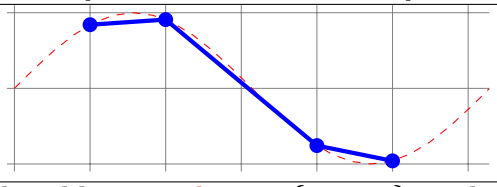
[color=blue,samples=5,mark=*]



[color=blue,domain=0:4]



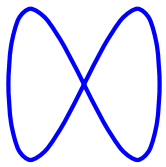
[color=blue,domain=1:5]



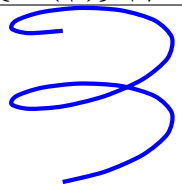
[color=blue,samples at={1,2,4,5},mark=*]

22.1.5 Fonctions paramétriques

```
\draw[domain=-3.141:3.141,smooth,variable=\t]plot ({sin(\t r)},{sin(2 *\t r)});
\draw[domain=0:720,smooth,variable=\t]plot ({sin(\t)},\t/360,{cos(\t)});
```



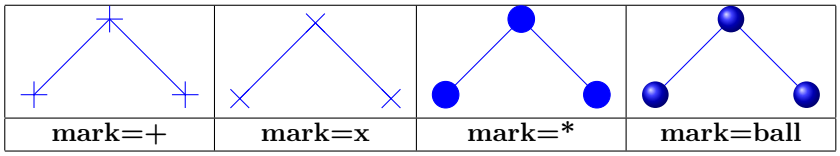
({sin(\t r)},{sin(2 *\t r)})



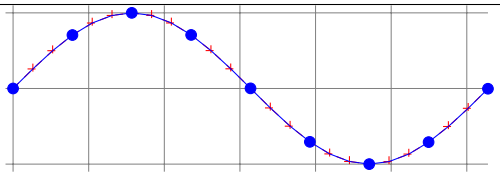
({sin(\t)},\t/360,{cos(\t)})

22.2 Marques

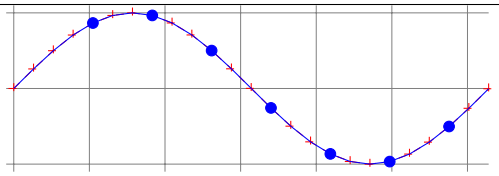
22.2.1 Marques avec TikZ



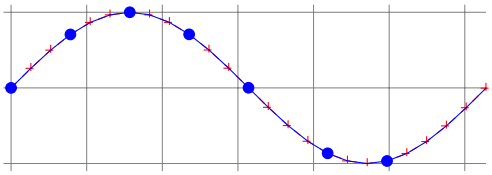
mark=+ | mark=x | mark=* | mark=ball



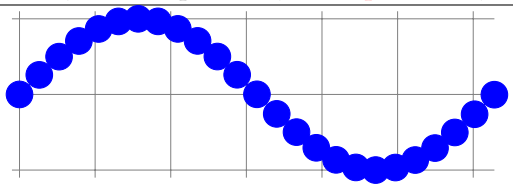
[color=blue,mark repeat=3,mark=*]



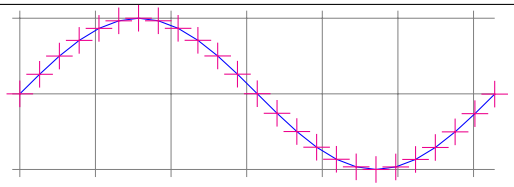
[color=blue,mark repeat=3,mark phase=5,mark=*]



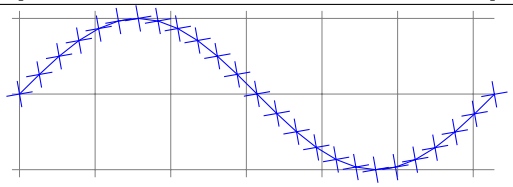
[color=blue,mark indices=1,4,...,15,17,20,mark=*]



[color=blue,mark size=5pt,mark=*]



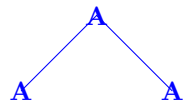
mark options={color=magenta},mark=+



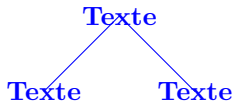
mark options={rotate=10},mark=+

22.2.2 Marques personnalisées avec text mark

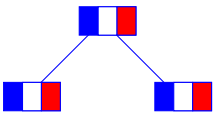
\draw[mark=text ,text mark=A,mark size=5pt] coordinates {(0,0) (1,1) (2,0)};



text mark=A



text mark=Texte



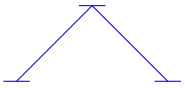
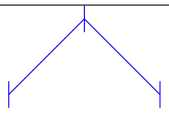
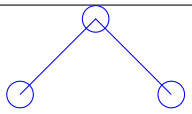
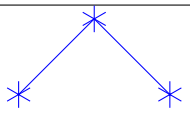
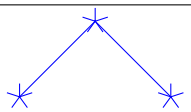
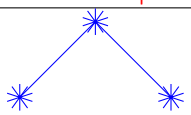
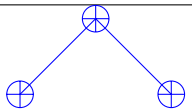
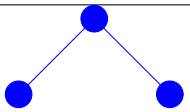
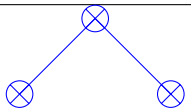
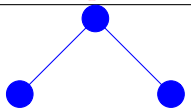
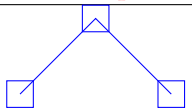
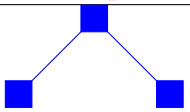
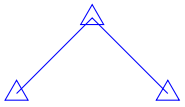
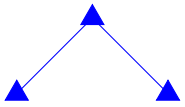
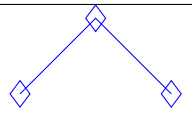
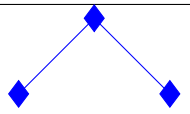
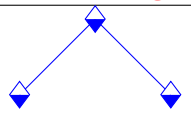
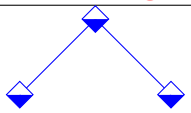
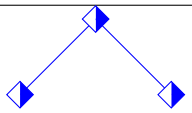
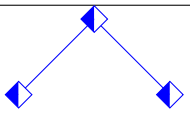
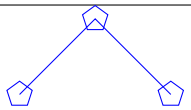
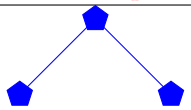
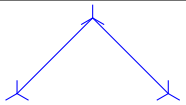
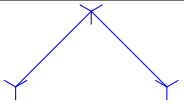
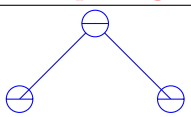
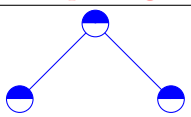
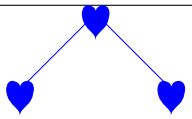
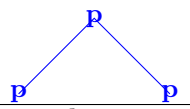
text mark=\DFR 88

text mark={\includegraphics[width=.5cm]{tiger}}

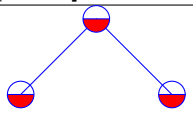
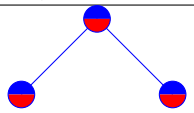
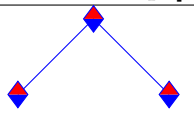
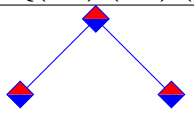
22.2.3 Marques avec l'extension plotmarks

Charger l'extension: \usetikzlibrary{plotmarks}

PGFmanual section : 63

			
mark=-	mark=|	mark=o	mark=asterisk
			
mark=*star	mark=*10-pointed star	mark=oplus	mark=oplus*
			
mark=otimes	mark=otimes*	mark=square	mark=square*
			
mark=triangle	mark=triangle*	mark=diamond	mark=diamond*
			
mark=halfdiamond*	mark=halfsquare*	mark=halfsquare right*	mark=halfsquare left*
			
mark=pentagon	mark=pentagon*	mark=Mercedes star	mark=Mercedes star flipped
			
mark=halfcircle	mark=halfcircle*	mark=heart	mark=text

```
\draw[mark=halfcircle,mark color=red,mark size=5pt] coordinates {(0,0) (1,1) (2,0)};
```

			
mark=halfcircle	mark=halfcircle*	mark=halfdiamond*	mark=halfsquare*

22.3 Graphes avec Gnuplot

```
\draw[color=red] plot[id=sin] function{sin(x)} ;
```

==> plot[id=sin] crée le fichier "sin.gnuplot"
==> Ouvrir le fichier "sin.gnuplot" avec le programme gnuplot pour créer le fichier "sin.table"
==> Utiliser le fichier de données "sin.table"

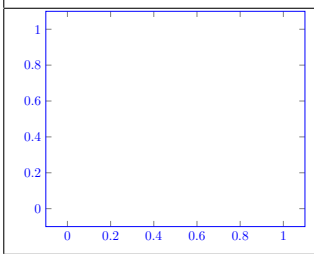
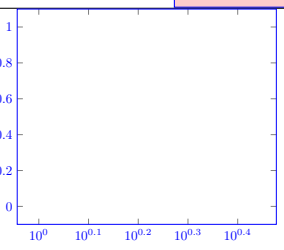
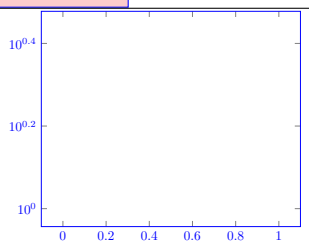
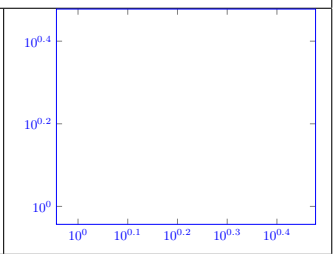
23 Créer un graphe avec pgfplot

Charger l'extension: \usepackage{pgfplots} [2]

23.1 Courbes 2 D

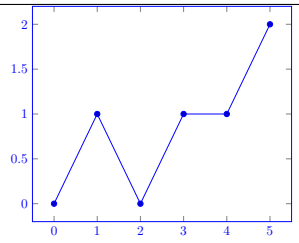
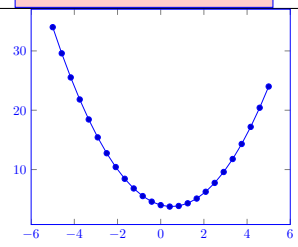
23.1.1 Axes

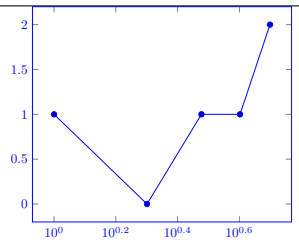
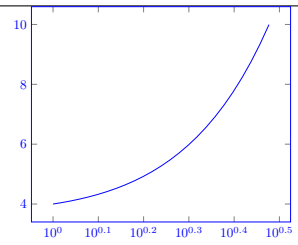
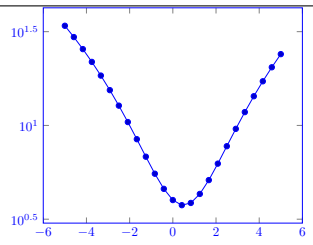
pgfplots section : 4-1

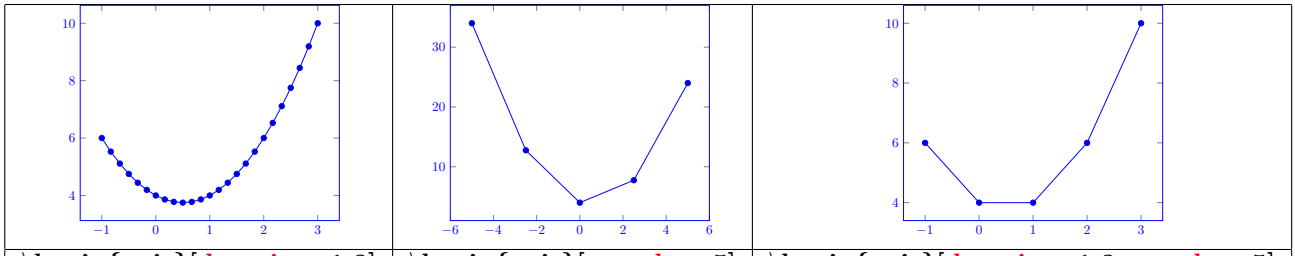
			
\begin{axis} \end{axis}	\begin{semilogxaxis} \end{semilogxaxis}	\begin{semilogyaxis} \end{semilogyaxis}	\begin{loglogaxis} \end{loglogaxis}

23.2 Tracé de la courbe

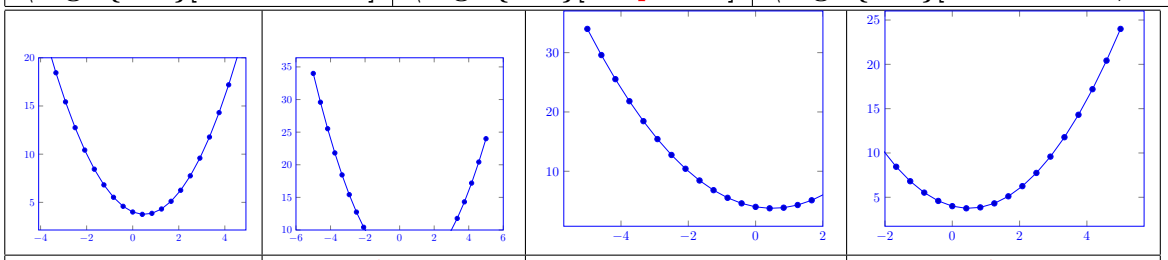
pgfplots section : 4-2

		
\addplot coordinates {(0,0) (1,1) (2,0) (3,1) (4,1) (5,2)};	\addplot {x^2 - x +4};	\addplot gnuplot[id=sin]{sin(x)};

		
axes : semilogxaxis	axes : semilogxaxis	axes : semilogyaxis
\addplot coordinates {(0,0) (1,1) (2,0) (3,1) (4,1) (5,2)};	\addplot {x^2 - x +4};	\addplot {x^2 - x +4};

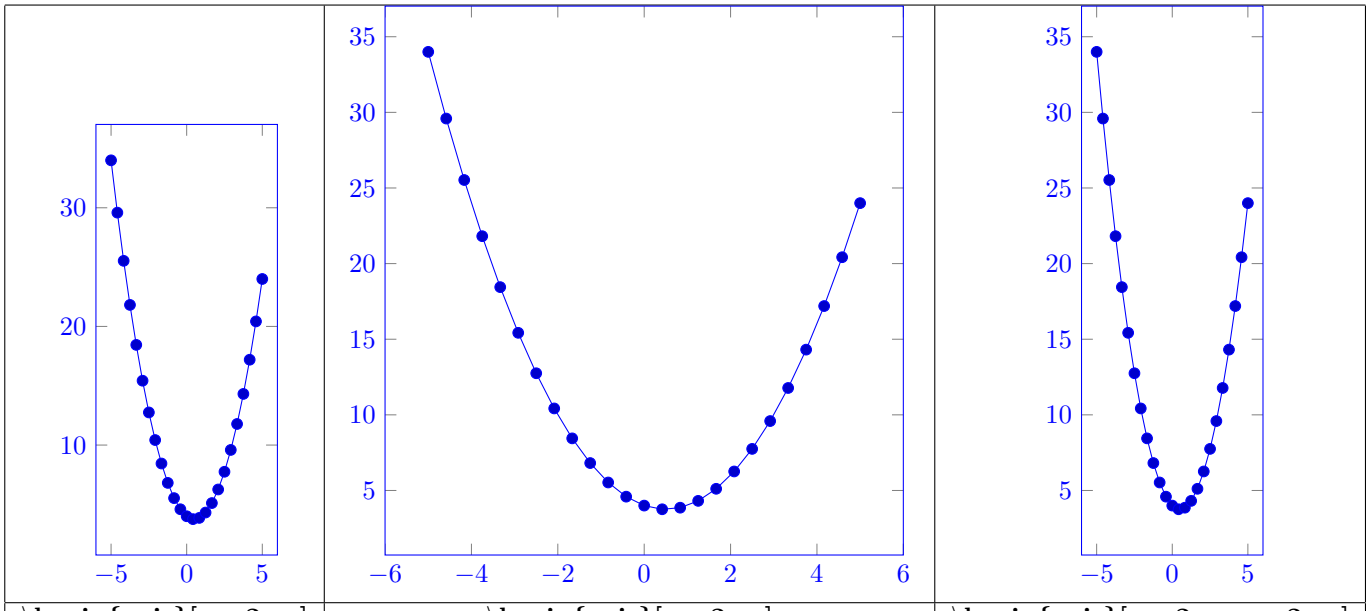


\begin{axis}[domain=-1:3]	\begin{axis}[samples=5]	\begin{axis}[domain=-1:3,samples=5]



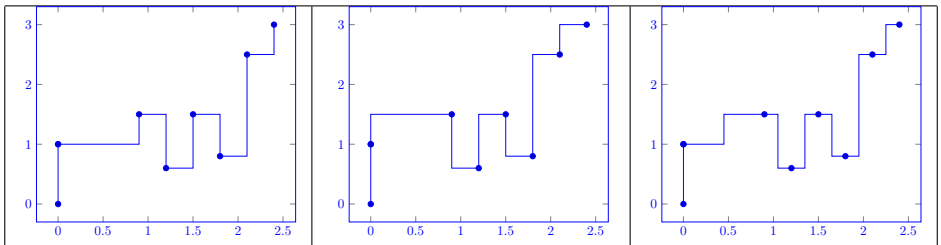
ymax=20	ymin=10	xmax=2	xmin=-2

23.2.1 Dimension unitaire en X et Y

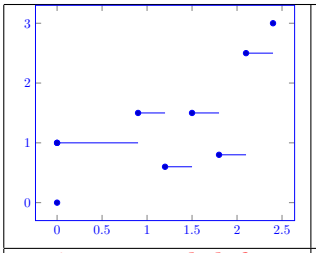


\begin{axis}[x=.2cm]	\begin{axis}[y=.2cm]	\begin{axis}[x=.2cm,y=.2cm]

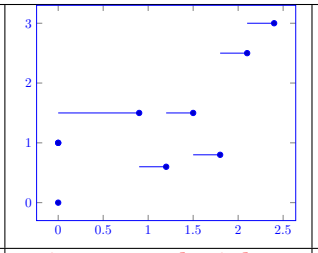
23.2.2 Type de graphiques



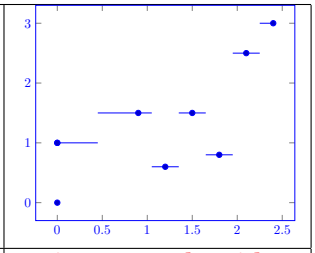
const plot	const plot mark right	const plot mark mid



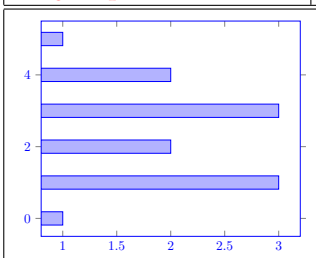
jump mark left



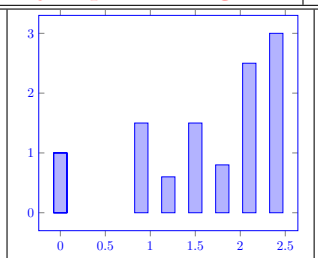
jump mark right



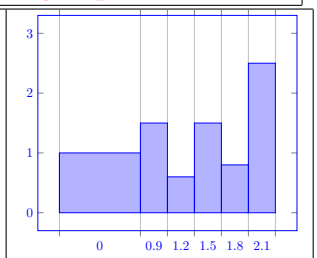
jump mark mid



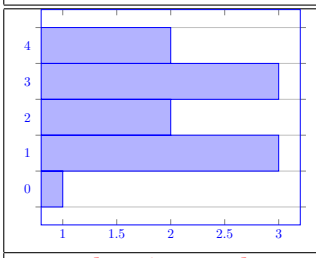
xbar



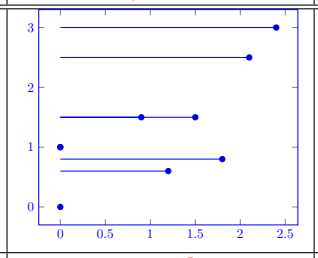
ybar



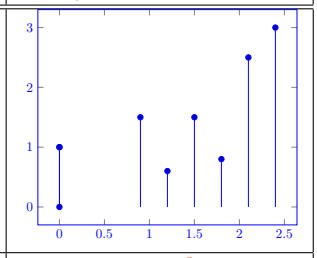
ybar interval



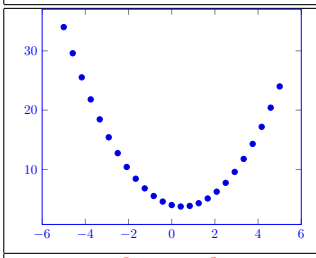
xbar interval



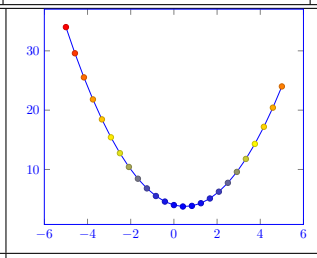
xcomb



ycomb



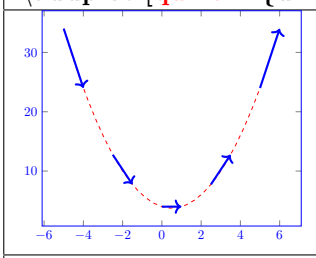
only marks



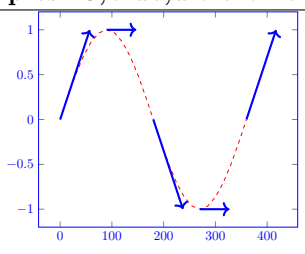
scatter

mesh

\addplot [quiver={u=1,v=2*x}],->,samples=5,blue,ultra thick] {x^2 - x +4};

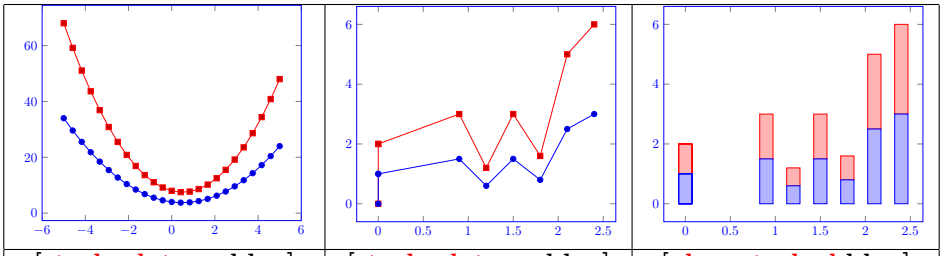


quiver=u=1,v=2*x

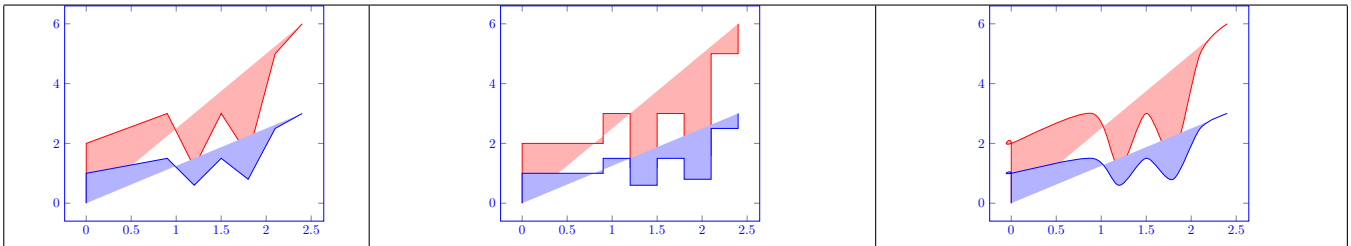


quiver={u=180/3.14,v=cos(x)}

Par défaut : : u=0 et v = 0

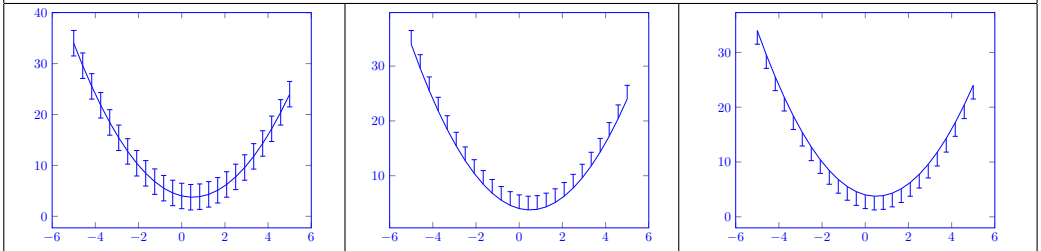


[stack plots=y,blue] | [stack plots=y,blue] | [ybar stacked,blue]



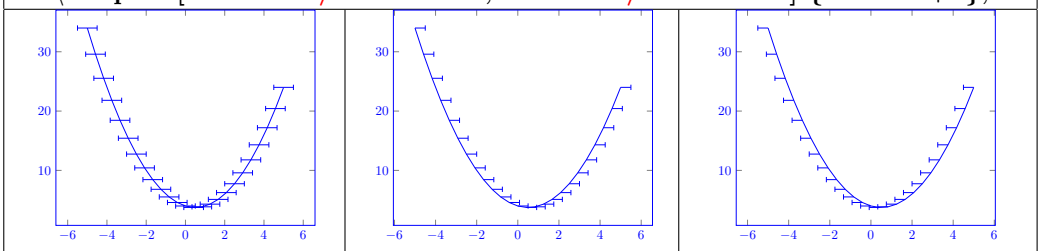
[stack plots=y,area style] | [const plot,stack plots=y,area style] | [stack plots=y,area style,smooth]

\addplot [error bars/y dir=both,error bars/y fixed =2.5] {x^2 - x +4};



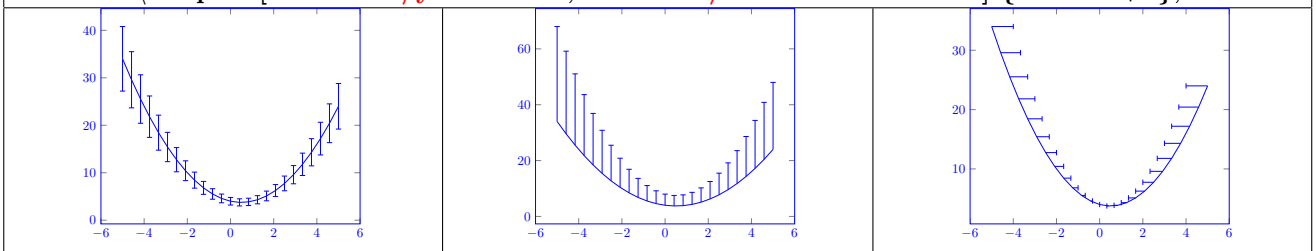
error bars/y dir =both | error bars/y dir =plus | error bars/y dir =minus

\addplot [error bars/x dir=both,error bars/x fixed =.5] {x^2 - x +4};



error bars/x dir =both | error bars/x dir =plus | error bars/x dir =minus

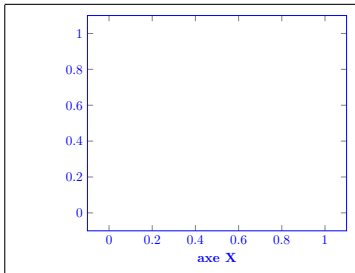
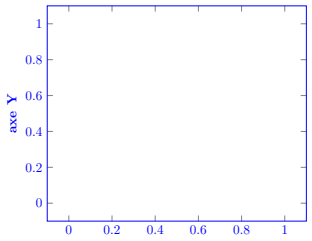
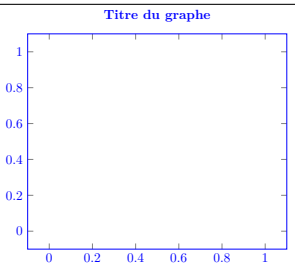
\addplot [error bars/y dir=both,error bars/x fixed relative =.2] {x^2 - x +4};



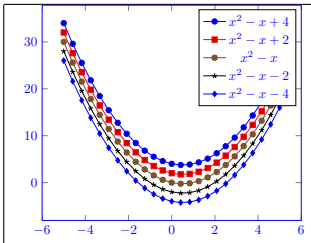
error bars/y fixed relative =.2 | error bars/y fixed relative =1 | error bars/x fixed relative =.2

23.3 Habillage du graphe

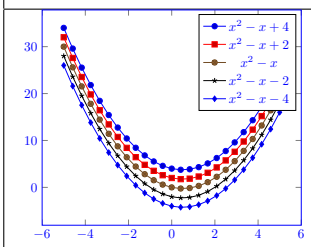
23.3.1 Titres

		
\begin{axis}[xlabel=axe X]	\begin{axis}[ylabel=axe Y]	\begin{axis}[title=Titre du graphe]

23.3.2 Légende

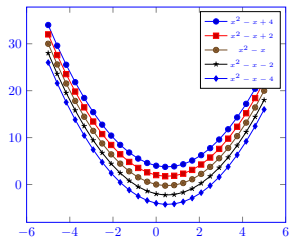
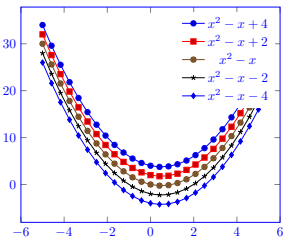
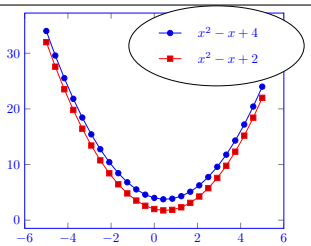


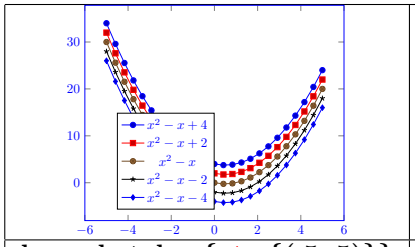
```
\begin{axis}
\addplot {x^2 - x +4};
\addplot {x^2 - x +2};
\addplot {x^2 - x };
\addplot {x^2 - x -2 };
\addplot {x^2 - x -4 };

\legend{$x^2 - x +4$,$x^2 - x +2$,$x^2 - x $,$x^2 - x -2 $,$x^2 - x -4 $}
\end{axis}
```



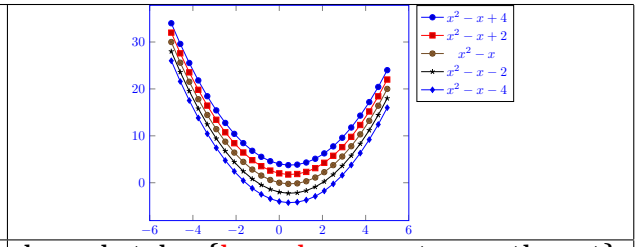
```
\begin{axis}[legend entries= {$ x^2 - x +4 $,$ x^2 - x +2 $,$ x^2 - x $,$ x^2 - x -2 $,$ x^2 - x -4 $} ]

\addplot {x^2 - x +4};
\addplot {x^2 - x +2};
\addplot {x^2 - x };
\addplot {x^2 - x -2 };
\addplot {x^2 - x -4 };
\end{axis}
```

Options

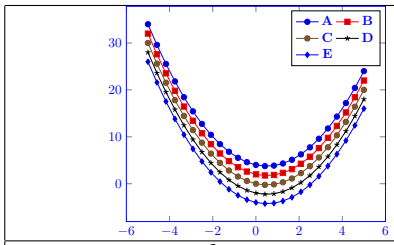
		
legend style={font=\tiny}	legend style={draw=none}	legend style={shape=ellipse}



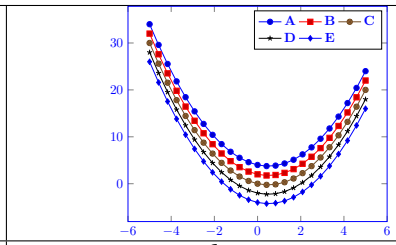
legend style={at={(.5,.5)}}



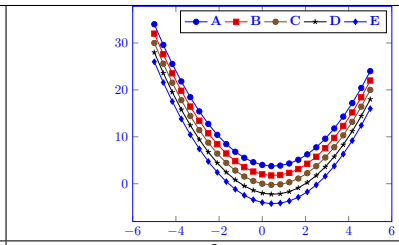
legend style={legend pos=outer north east}



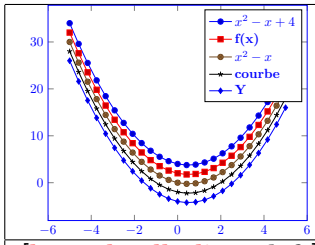
legend style={legend columns=2}



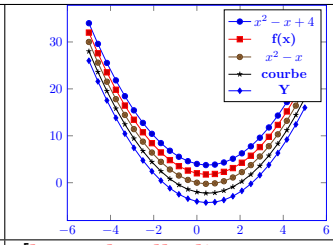
legend style={legend columns=3}



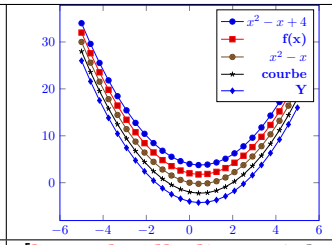
legend style={legend columns=-1}



[legend cell align=left]

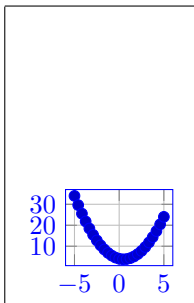


[legend cell align=center]

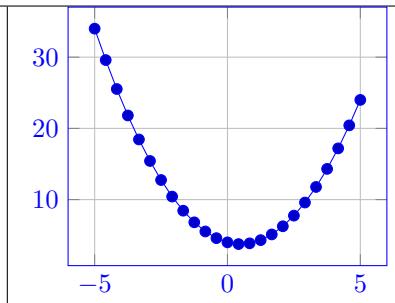


[legend cell align=right]

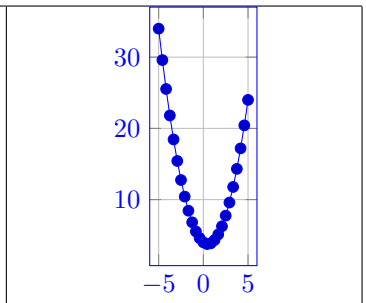
23.3.3 Taille du graphe



width=3cm

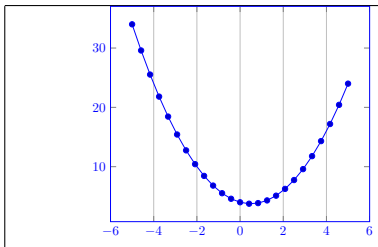


height=5cm

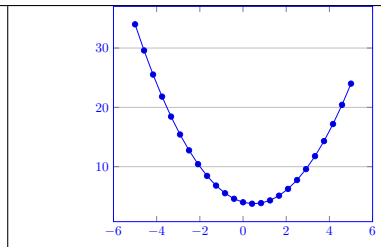


width=3cm,height=5cm

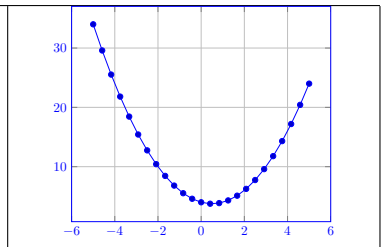
23.3.4 Quadrillage



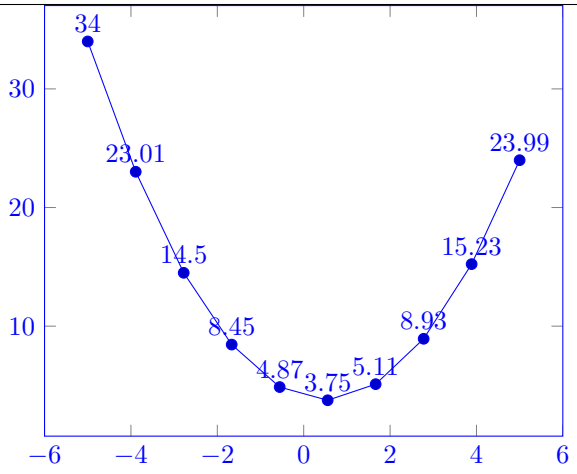
\begin{axis}[xmajorgrids=true]



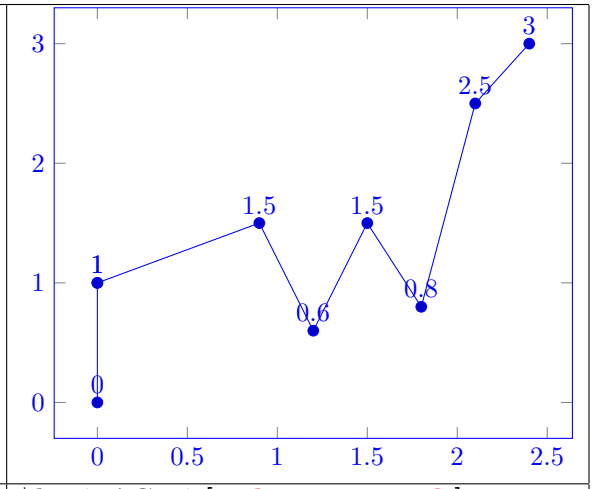
\begin{axis}[ymajorgrids=true]



\begin{axis}[grid=major]



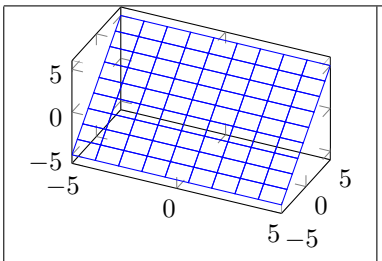

```
\beginACaxis[nodes near coords,samples=10]
\addplot {x^ 2- x +4};
```



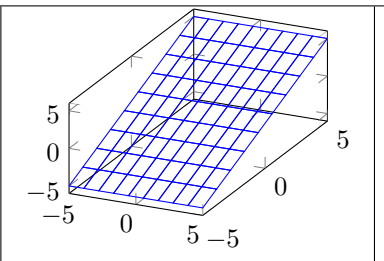

```
\beginACaxis[nodes near coords]
\addplot file table2.dat;
```

24 Courbes 3D

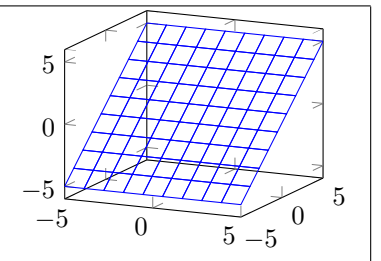
24.0.1 Axes



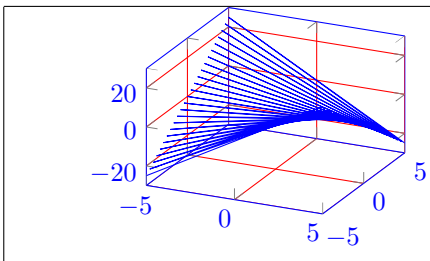
plot box ratio=2 1 1



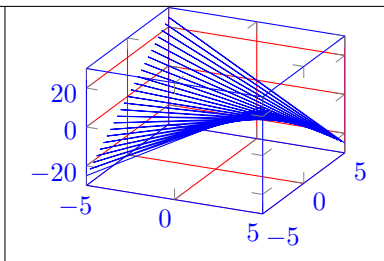
plot box ratio=1 2 1



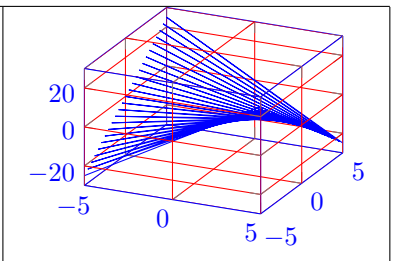
plot box ratio=1 1 2



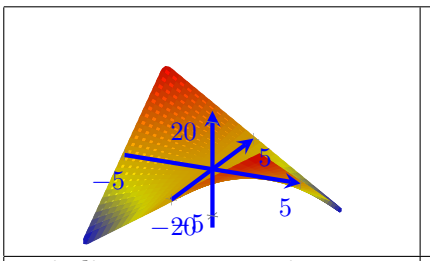
3d box=background (Par défaut :)



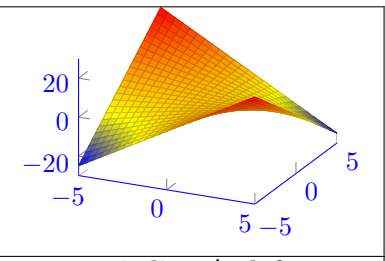
3d box=complete



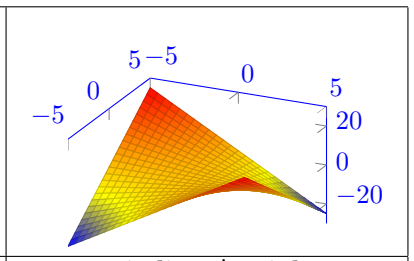
3d box=complete*



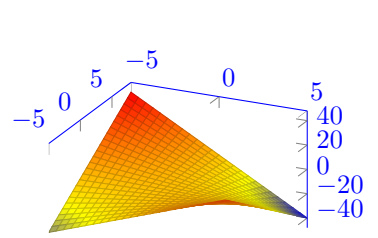
axis lines=center,axis on top

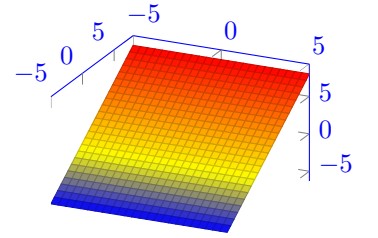


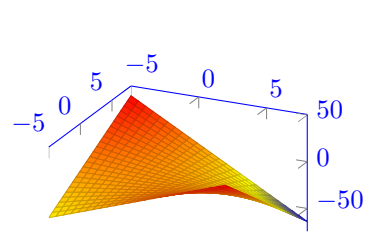
axis lines*=left

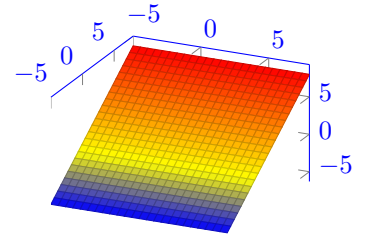


axis lines*=right

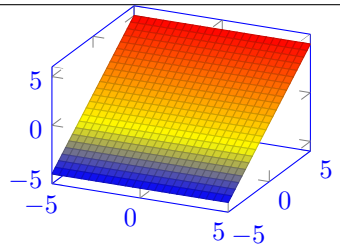
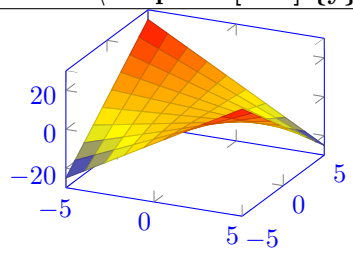


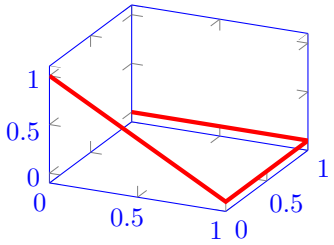
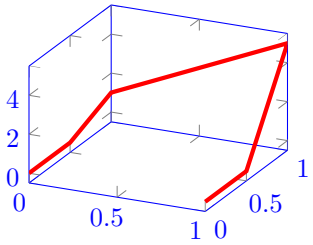
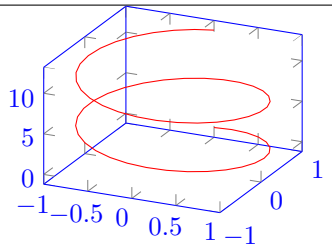






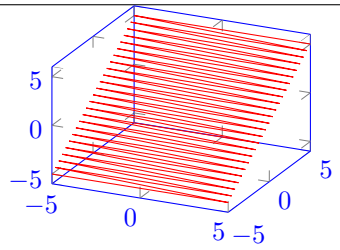
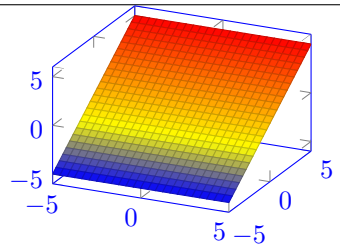
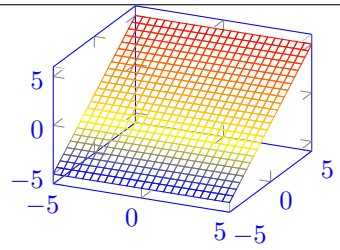
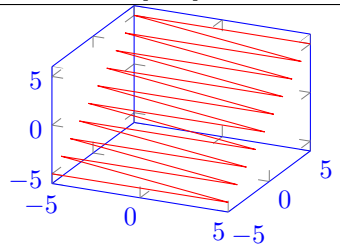
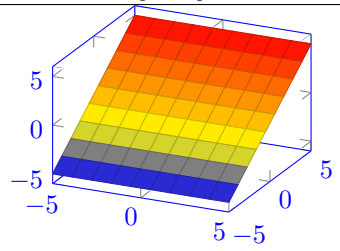
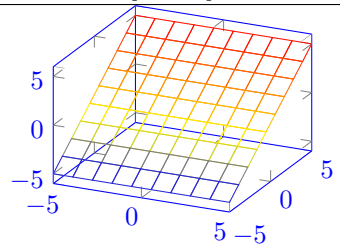
24.0.2 Tracé de la courbe

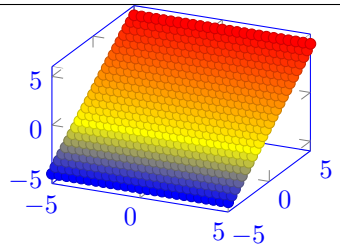
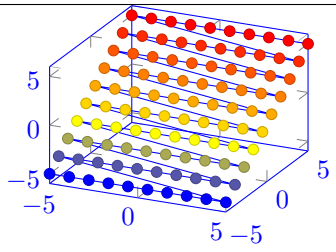
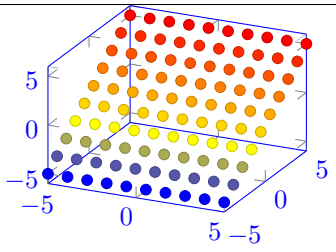
\addplot3 [surf] {y};		
		
{y}	{-x*y}	gnuplot[id=sinxy]{sin(x)*sin(y)};

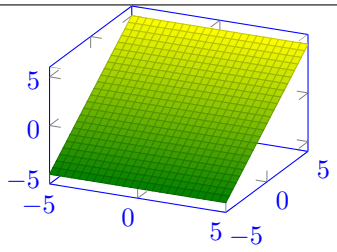
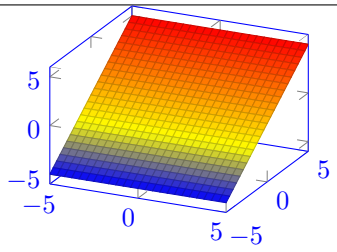
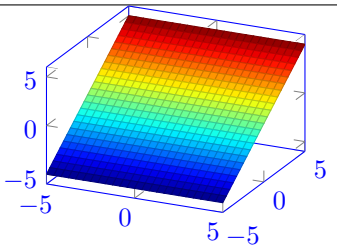
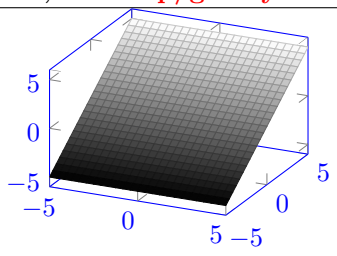
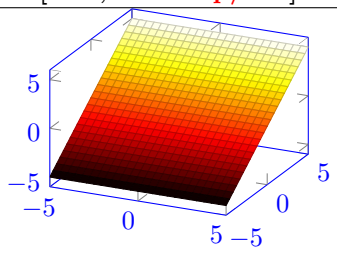
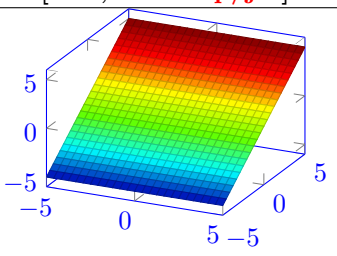
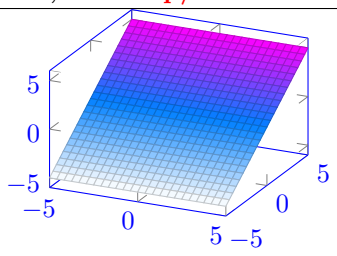
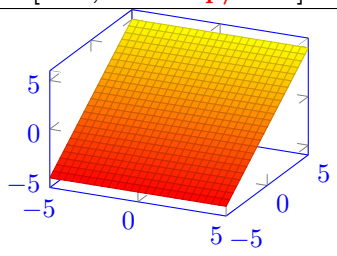
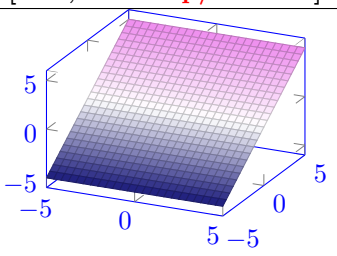
		
coordinates {(0,0,1) (1,0,0) (1,1,0) (0,1,0)};	file {table3.dat};	{sin(x)},{cos(x)},{x/60});

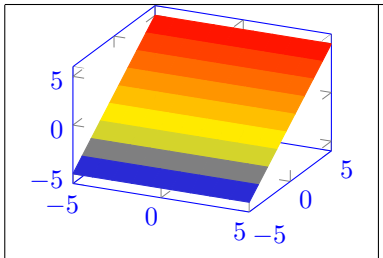
Contenu du fichier table3.dat		
0	0	0
0	0.5	0
0	1	1
1	1	5
1	0.5	0
1	0	0

24.0.3 Aspect

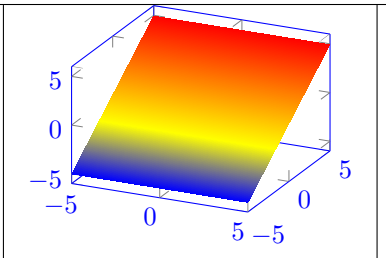
		
[red]	[surf]	[mesh]
		
[red,samples=10]	[surf,samples=10]	[mesh,samples=10]

		
[scatter]	[scatter,samples=10]	[scatter,samples=10,only marks]

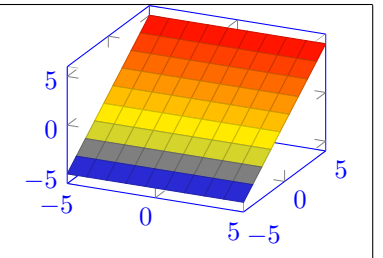
		
[surf,colormap/greenyellow]	[surf,colormap/hot]	[surf,colormap/jet]
		
[surf,colormap/blackwhite]	[surf,colormap/hot2]	[surf,colormap/bluered]
		
[surf,colormap/cool]	[surf,colormap/redyellow]	[surf,colormap/violet]



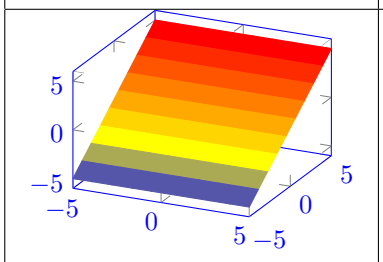
shader=flat



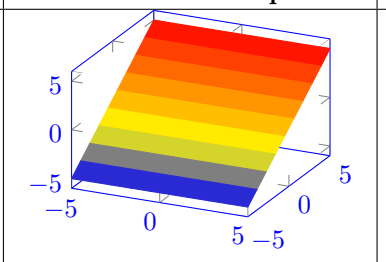
shader=interp



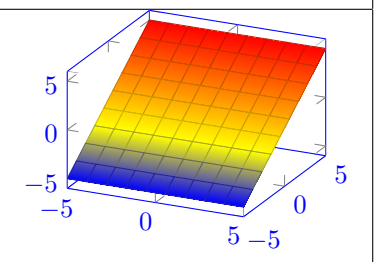
shader=faceted



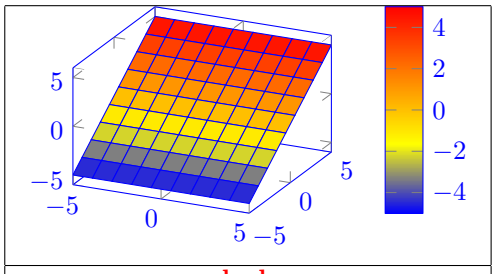
shader=flat corner



shader=flat mean

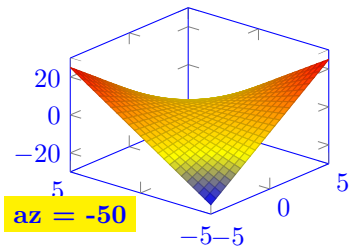


shader=faceted interp



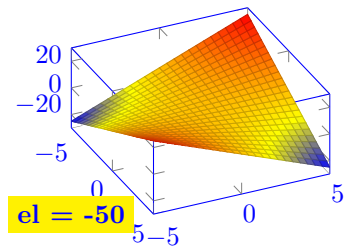
colorbar

24.0.4 Point de vue



Azimut

view/az= angle de - 50 à +50



Elévation

view/el= angle de - 50 à +50

25 Les Tableaux de variation

Charger l'extension: \usepackage{tkz-tab} [3]

25.1 Déclaration du tableau

1° ligne	a	b	c
2° ligne			

```
\begin{tikzpicture}
\tkzTabInit{1° ligne / 1 ,2° ligne /1 } { a , b, c }
\end{tikzpicture}
```

25.1.1 Options

Hauteur des ligne

1° ligne	a	b	c
2° ligne			
3° ligne			

```
\tikz \tkzTabInit{1° ligne '/1 , 2° ligne /.5 , 3° ligne /1.5 }{a , b , c };
```

Largeur de la première colonne

x	a	b	c

```
\tkzTabInit[lgt=4]{ x / 1}{ a , b , c };
Par défaut : : lgt==2 cm
```

Espacement entre deux valeurs

x	a	b	c

```
\tkzTabInit[espcl=1]{ x / 1}{ a , b , c };
Par défaut : : espcl=2 cm
```

Marge de début et de fin

x	a	b	c

```
\tkzTabInit[deltacl=1]{ x / 1}{ a , b , c };
Par défaut : : deltacl=0.5 cm
```

Épaisseur des lignes du tableau

x	a	b	c

\tkzTabInit[dlw=2pt]{ x / 1}{ a , b , c };
Par défaut : : lw=0,4 pt

Absence de cadre

x	a	b	c

\tkzTabInit[nocadre]{ x / 1}{ a , b , c };
Par défaut : : nocadre=false

Mise en couleur

\tkzTabInit [color,colorT = yellow]{1°ligne/1 , 2°ligne/1}{ a , b }

1°ligne	a	b
2°ligne		

[color,colorT = yellow]

1°ligne	a	b
2°ligne		

[color,colorC = cyan]

1°ligne	a	b
2°ligne		

[color,colorL = green]

1°ligne	a	b
2°ligne		

[color,colorV = magenta]

Par défaut : : color = false

colorT=colorC=colorL=colorV =white

25.2 Création d'une ligne de signes

x	a	b	c
$f(x)$		2	4

\tkzTabLine{ t, 2,t ,4 ,t }

x	a	b	c		
$f(x)$	0	2	0	4	0

\tkzTabLine{ z, 2, z ,4 ,z }

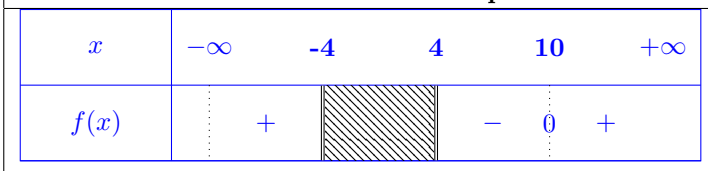
x	a	b	c
$f(x)$		2	4

\tkzTabLine{ d, 2, d ,4 ,d }

x	a	b	c		
$f(x)$	1		3	4	5

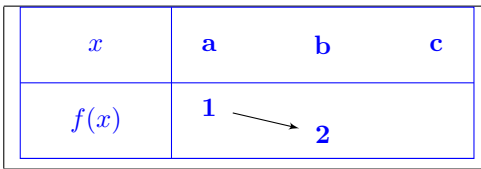
\tkzTabLine{ 1, h, 3 ,4 ,5 }

Exemple

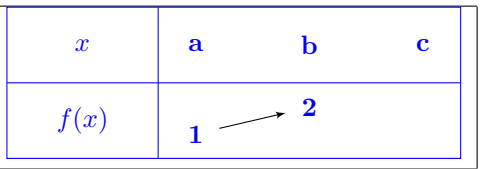



```
\begin{tikzpicture}
\tkzTabInit[espcl=1.5]{$x$ / 1 ,$f(x)$ /1 } { −∞ , -4, 4 , 10 , +∞ }
\tkzTabLine{ t,+, d ,h ,d,-,z,+ }
\end{tikzpicture}
```

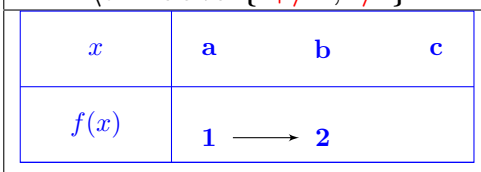
25.3 Création d'une ligne de variations



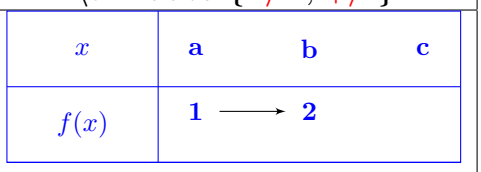

```
\tkzTabVar{ +/1 , -/2}
```



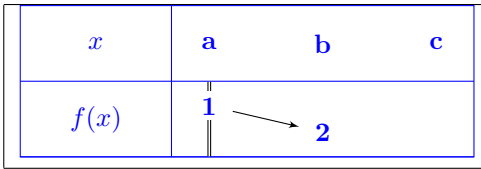

```
\tkzTabVar{ -/1 , +/2}
```



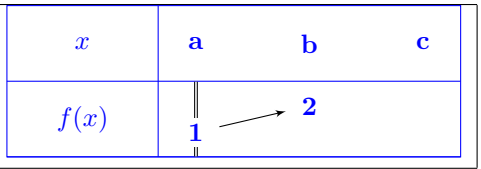

```
\tkzTabVar{-/1 , -/2}
```



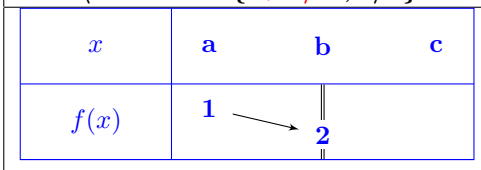

```
\tkzTabVar{ +/1 , +/2 }
```



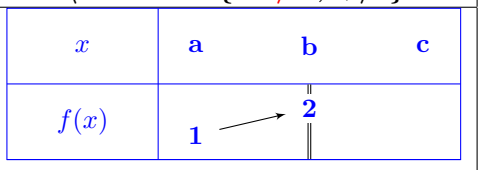

```
\tkzTabVar{ +C/1 , -/2}
```



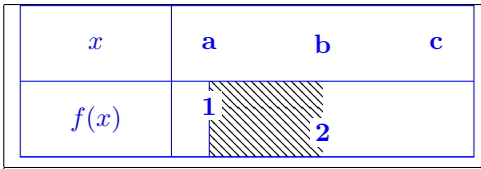

```
\tkzTabVar{ -C/1 , +/2}
```



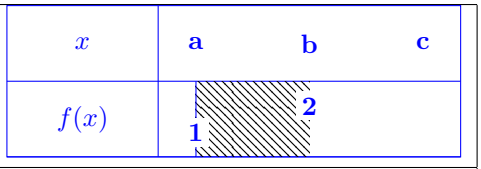

```
\tkzTabVar{-/1 , -C/2}
```



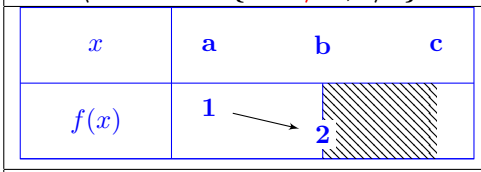

```
\tkzTabVar{ +/1 , +C/2 }
```



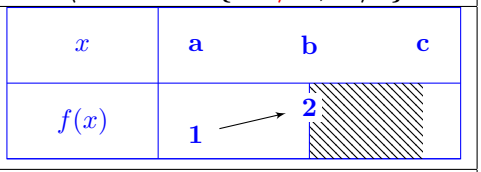

```
\tkzTabVar{ +H/1 , -/2}
```



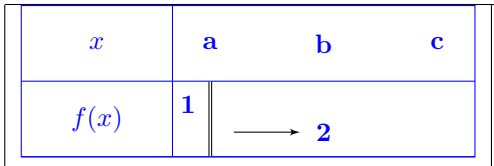

```
\tkzTabVar{ -H/1 , +/2}
```



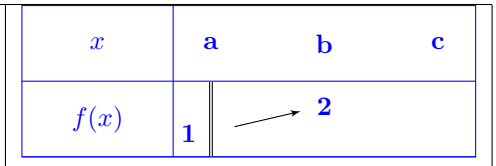

```
\tkzTabVar{-/1 , -H/2}
```



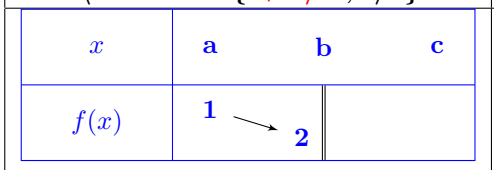

```
\tkzTabVar{ +/1 , +H/2 }
```



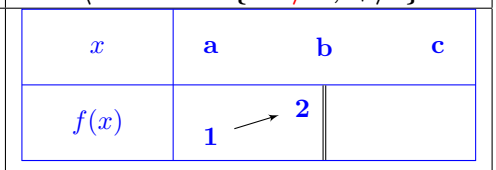
\tkzTabVar{ +D/1 , -/2}



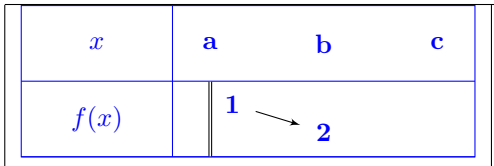
\tkzTabVar{ -D/1 , +/2}



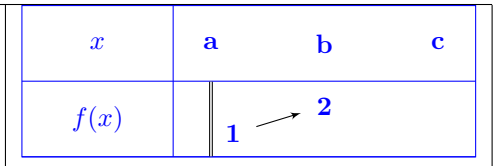
\tkzTabVar{-/1 , -D/2}



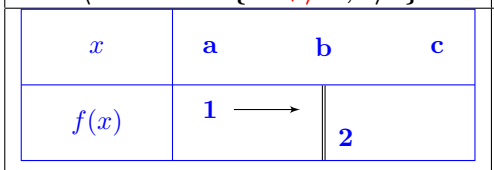
\tkzTabVar{ +/1 , +D/2 }



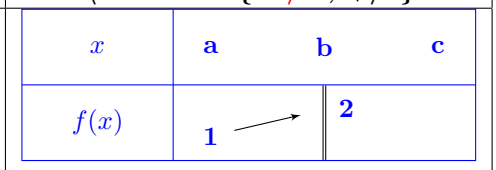
\tkzTabVar{ D+/1 , -/2}



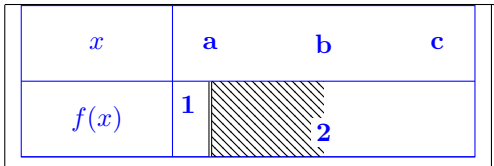
\tkzTabVar{D-/1 , +/2}



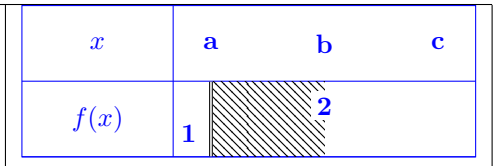
\tkzTabVar{-/1 , D-/2}



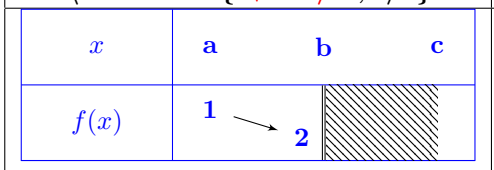
\tkzTabVar{ +/1 , D+/2 }



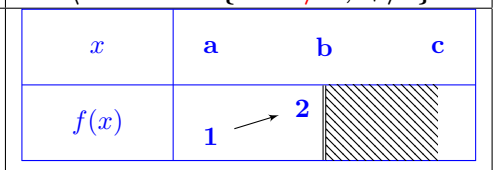
\tkzTabVar{ +DH/1 , -/2}



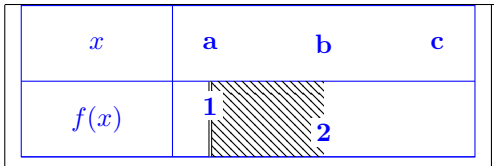
\tkzTabVar{ -DH/1 , +/2}



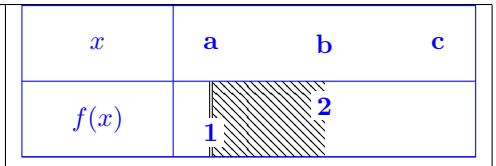
\tkzTabVar{-/1 , -DH/2}



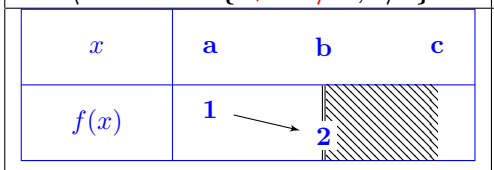
\tkzTabVar{ +DH/1 , +/2 }



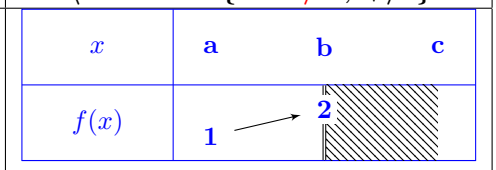
\tkzTabVar{ +CH/1 , -/2}



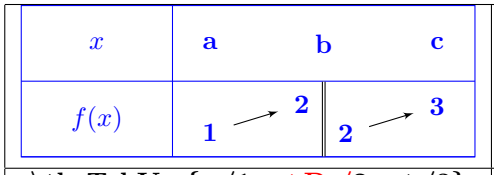
\tkzTabVar{ -CH/1 , +/2}



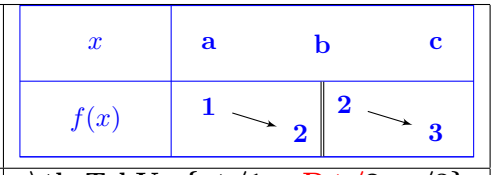
\tkzTabVar{-/1 , -CH/2}



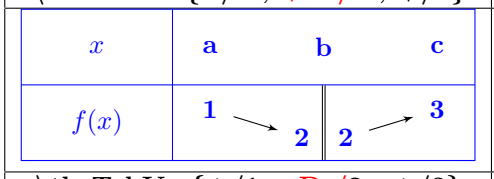
\tkzTabVar{ +/1 , +CH/2 }



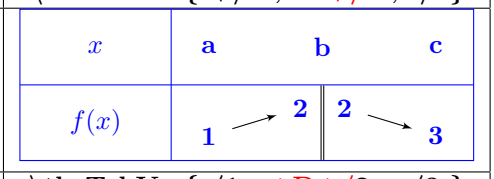
\tkzTabVar{ -/1 , +D-/2 , +/3}



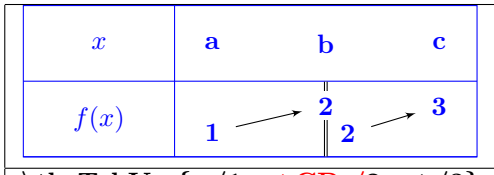
\tkzTabVar{ +/1 , -D+/2 , -/3}



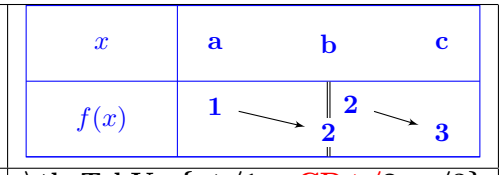
\tkzTabVar{+/1 , -D-/2 , +/3}



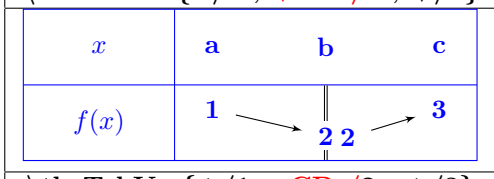
\tkzTabVar{-/1 , +D+/2 , -/3 }



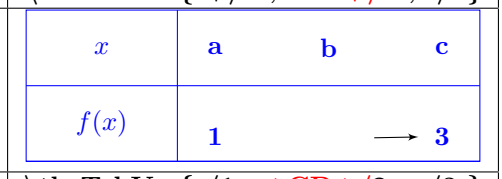
\tkzTabVar{ -/1 , +CD-/2 , +/3}



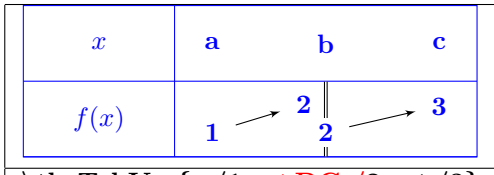
\tkzTabVar{ +/1 , -CD+/2 , -/3}



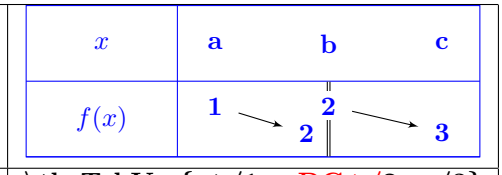
\tkzTabVar{+/1 , -CD-/2 , +/3}



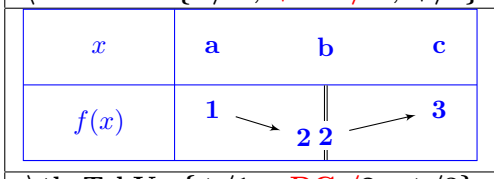
\tkzTabVar{-/1 , +CD+/2 , -/3 }



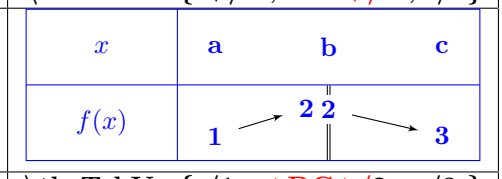
\tkzTabVar{ -/1 , +DC-/2 , +/3}



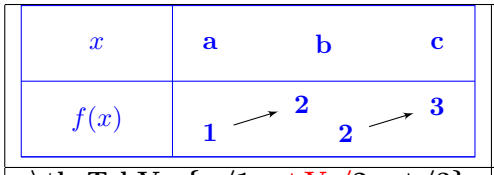
\tkzTabVar{ +/1 , -DC+/2 , -/3}



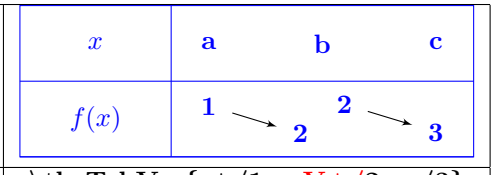
\tkzTabVar{+/1 , -DC-/2 , +/3}



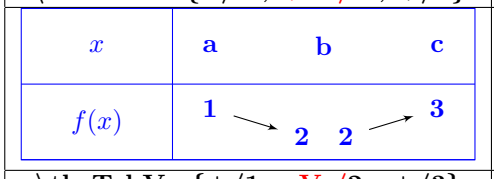
\tkzTabVar{-/1 , +DC+/2 , -/3 }



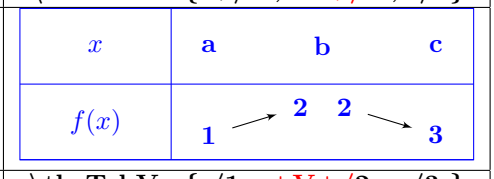
\tkzTabVar{ -/1 , +V-/2 , +/3}



\tkzTabVar{ +/1 , -V+/2 , -/3}

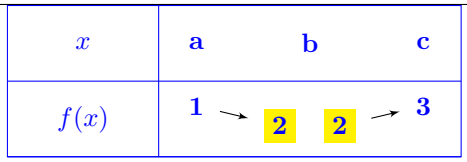


\tkzTabVar{+/1 , -V-/2 , +/3}



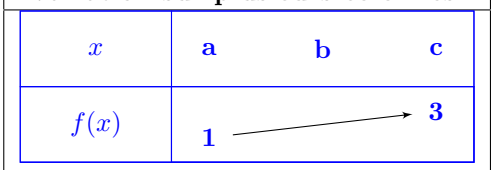
\tkzTabVar{-/1 , +V+/2 , -/3 }

Mise en évidence d'une valeur



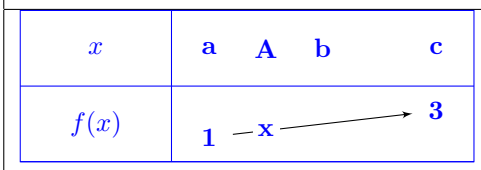
\tkzTabVar{+/1 , -V-/\colorbox{yellow}{2} , +/3}

Variation sur plusieurs colonnes

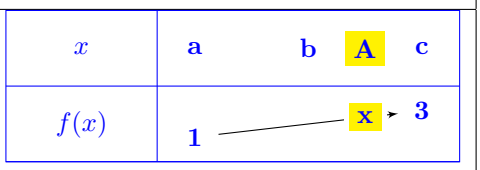


\tkzTabVar{-/1 , R/ , +/3}

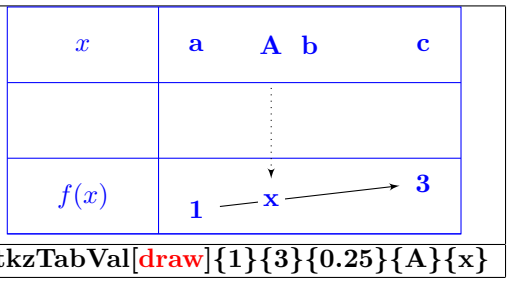
Valeurs intermédiaires



\tkzTabVal{1}{3}{0.25}{A}{x}

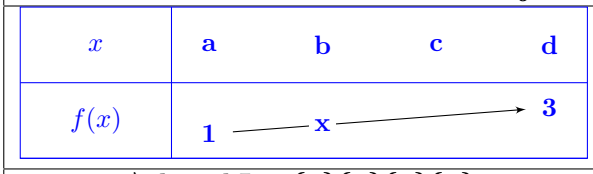


\tkzTabVal{1}{3}{0.75}{A}{x}

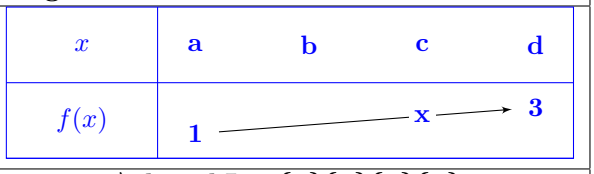


\tkzTabVal[draw]{1}{3}{0.25}{A}{x}

Ajout d'images



\tkzTabIma{1}{4}{2}{x}

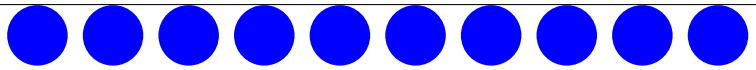


\tkzTabIma{1}{4}{3}{x}

26 Les répétitions

Utilisation du module “pgffor” chargé automatiquement avec TikZ

26.1 Répétition à 1 variable

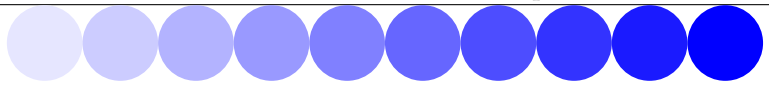


```
\tikz \foreach \x in {1,...,10} \fill[blue](\x,0) circle (0.4cm);
```

Variable \x : position en X

26.2 Répétition à 2 variables

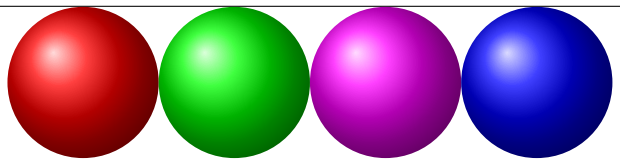
Liste de variables numériques



```
\tikz \foreach \pos/\y in {1/10,2/20,3/30,4/40,5/50,6/60,7/70,8/80,9/90,10/100}
\fill[color=blue!\y](\pos,0) circle (0.5cm);
```

Variable \pos : position en X Variable \y : couleur

Liste de variables mixtes



```
\tikz \foreach \x/\col in 1/red,3/green,5/magenta,7/blue \shade[ball color=\col](\x,0) circle (1);
```

Variable \x : position en X Variable \col : couleur

Liste de variables avec un pas

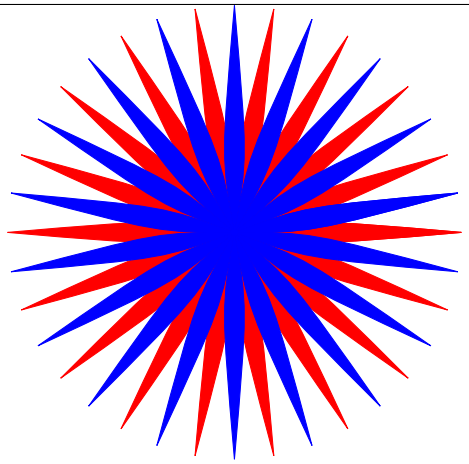
1,3	2,3	3,3	4,3	7,3	8,3	9,3	10,3
1,2	2,2	3,2	4,2	7,2	8,2	9,2	10,2
1,1	2,1	3,1	4,1	7,1	8,1	9,1	10,1

```
\begin{tikzpicture}
\foreach \x in{1,2,...,4,7,8,...,10}
\foreach \y in {1,...,3}
{ \draw (\x,\y) +(-.5,-.5) rectangle ++(.5,.5); \draw (\x,\y)
node\x,\y; }
\end{tikzpicture}
```

Variable \x : position en X Variable \y : position en Y

Exemples de liste	
1, 2, 3, 4, 5, 6,	\foreach \x in {1,...,6} {\x, }
1, 3, 5, 7, 9, 11,	\foreach \x in {1,3,...,11} {\x, }
Z, X, V, T, R, P, N,	\foreach \x in {Z,X,...,M} {\x, }
2^1, 2^2, 2^3, 2^4, 2^5, 2^6, 2^7,	\foreach \x in {2^1,2^...,2^7} {\x, }
$0cm$, $0.5cm$, $1cm$, $1.5cm$, $2cm$, $2.5cm$, $3cm$,	\foreach \x in {0cm,0.5cm,...cm,3cm} {\x, }
A_1, B_1, C_1, D_1, E_1, F_1, G_1, H_1,	\foreach \x in {A_1,..._1,H_1} {\x, }

Variables numériques avec opération

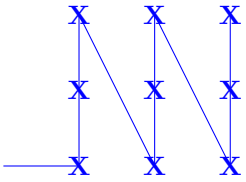


```
\begin{tikzpicture}
\foreach \x in 0,20,...,360{ \filldraw[red] (0,0) .. controls (\x+10:1)
.. (\x:1) .. controls (\x-10:1) .. (0,0);}
\foreach \x in 10,30,...,370{ \filldraw[blue] (0,0) .. controls (\x+10:3)
.. (\x:3) .. controls (\x-10:3) .. (0,0);}
\end{tikzpicture}
```

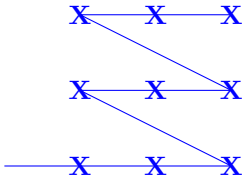
Variable \x : angle

26.3 Répétition à 2 variables - boucles imbriquées

Ordre des boucles imbriquées



```
\begin{tikzpicture}
\draw (0,0)
\foreach \x in {1,2,3}
\foreach \y in {0,1,2}
{– (\x,\y) node{X}};
\end{tikzpicture}
```



```
\begin{tikzpicture}
\draw (0,0)
\foreach \y in {0,1,2}
\foreach \x in {1,2,3}
{– (\x,\y) node{X}};
\end{tikzpicture}
```

27 Dessin robotisé

Charger l'extension: \usetikzlibrary{turtle}

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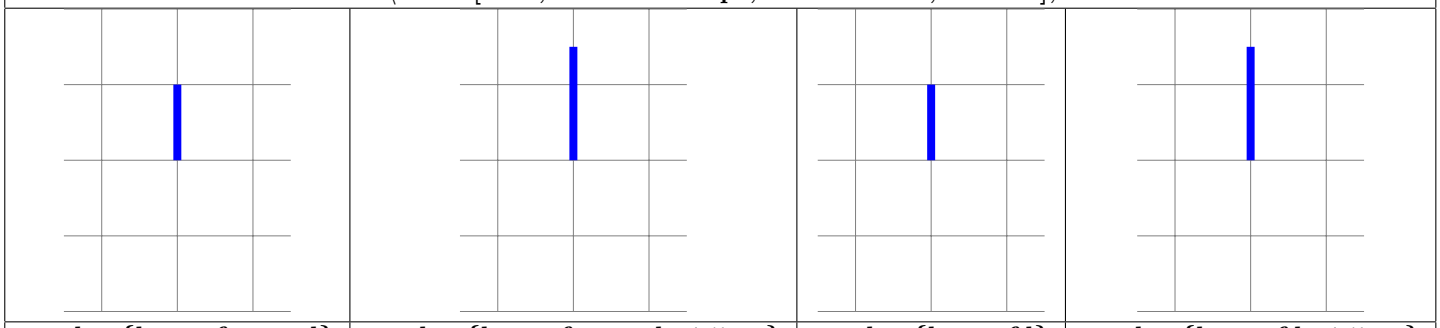
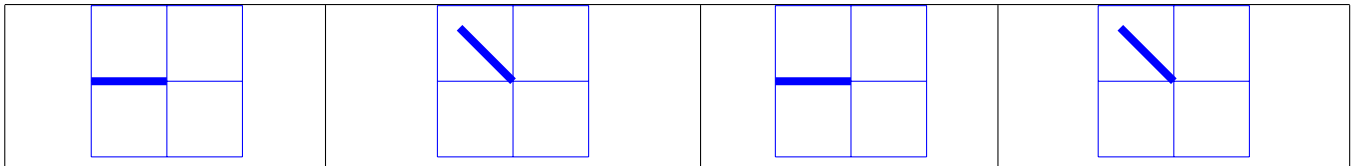
\draw [blue,line width=3pt,turtle=home,forward];



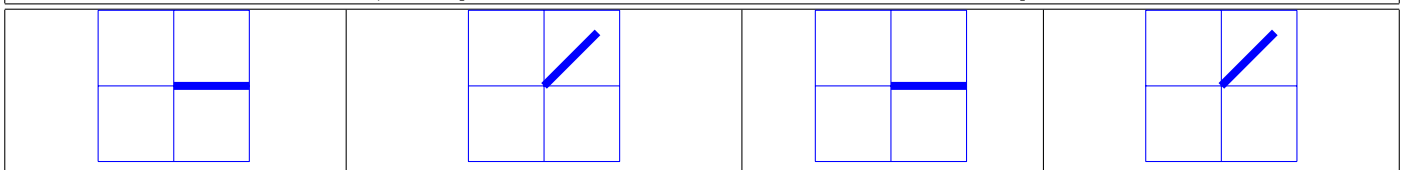
turtle={home,forward}	turtle={home,forward=1.5cm}	turtle={home,fd}	turtle={home,fd=1.5cm}

\draw [blue,line width=3pt,turtle=home,left,fd];



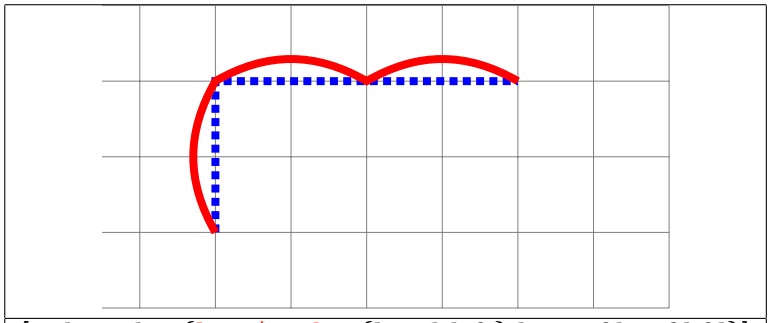
turtle={home,left,fd}	turtle={home,left=45,fd}	turtle={home,lt,fd}	turtle={home,lt=45,fd}

\draw [blue,line width=3pt,turtle=home,right,fd];

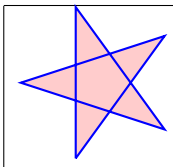


turtle={home,right,fd}	turtle={home,right=45,fd}	turtle={home,rt,fd}	turtle={home,rt=45,fd}

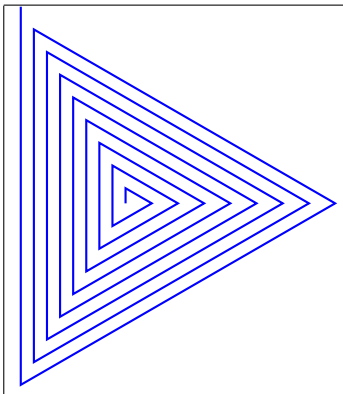
[->,turtle=home,rt,fd,fd,lt,fd,lt,fd]	[->,turtle/distance=2cm,turtle=home,rt,fd,fd,lt,fd,lt,fd]



[red,turtle={how/.style={bend left},home,fd,rt,fd,fd}]



```
\filldraw[turtle/distance=2cm,thick,blue,fill=red!20]
[ turtle=home ]
\foreach \i in {1,...,5}
[ turtle={forward,right=144} ] ;
```

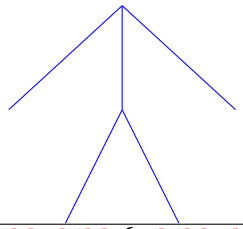


```
\draw[thick,blue]
[ turtle=home ]
\foreach \i in {1,...,25}
[turtle={forward=\i/5,right=120} ] ;
```

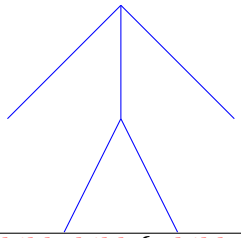
28 Les diagrammes arborescents

PGFmanual section : 21

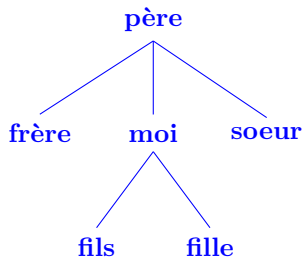
28.1 Structure



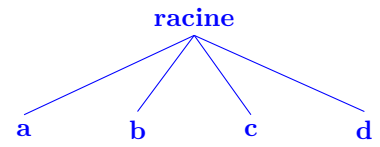
```
\node {} child child { child child } child ;
```



```
\coordinate child child { child child } child ;
```

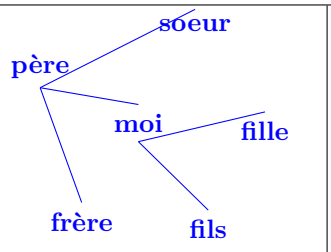



```
\begin{tikzpicture}
\node {père}
child {node {frère}}
child {node {moi}
child {node {fils}}
child {node {fille}}}
child {node{soeur}};
\end{tikzpicture}
```

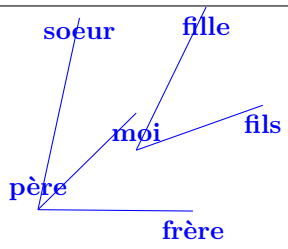



```
\node {racine} child foreach \name in {a,b,c,d} {node {\name}};
```

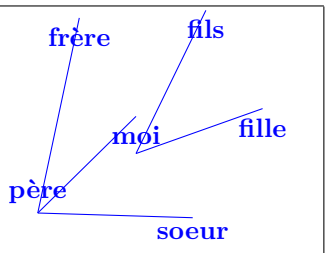
28.2 Orientation



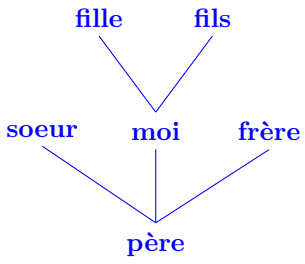

```
\node {père}[grow=-30]
```



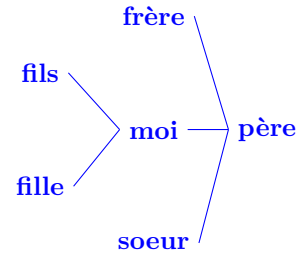

```
\node {père}[grow=30]
```



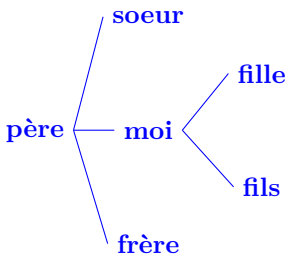

```
\node {père}[grow'=30]
```



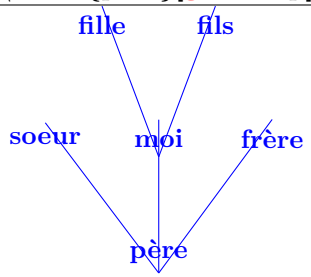
\node {père}[grow=up]



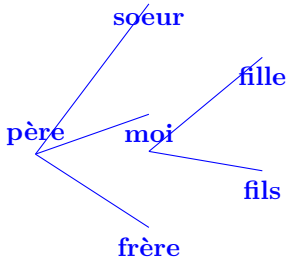
\node {père}[grow=left]



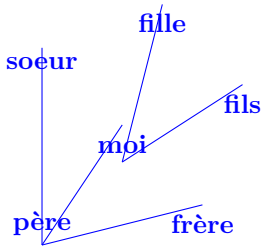
\node {père}[grow=right]



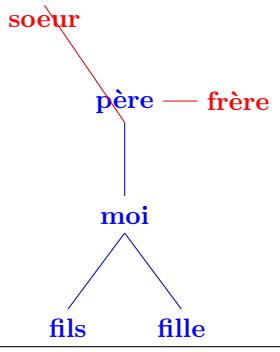
\node {père}[grow=north]



\node {père}[grow=east]



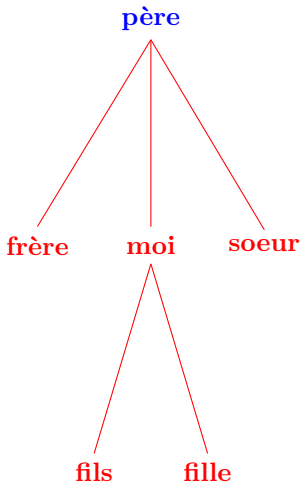
\node {père}[grow=north east]



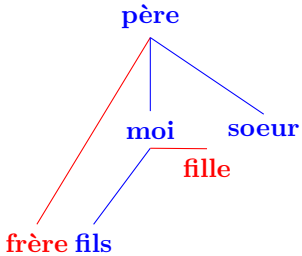

```
\node {père}
child[grow=right,red] {node {frère}}
child {node {moi}
child {node {fils}}
child {node {fille}}}
child[grow=north west,red] {node{soeur}};
```

28.3 Distance

28.4 Distance père fils

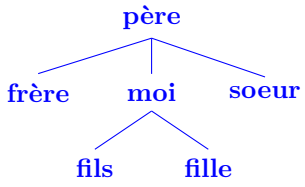
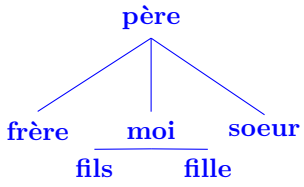


\node {père}[level distance=3cm,red]

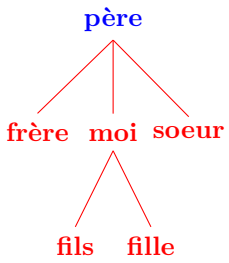
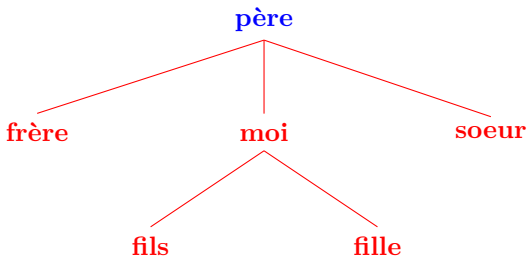


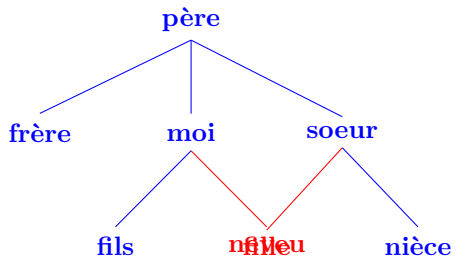
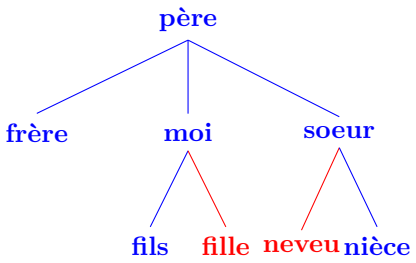
child[level distance=3cm,red] {node {frère}}
child[level distance=.5cm,red] {node {fille}}

Par défaut : : level distance=15 mm

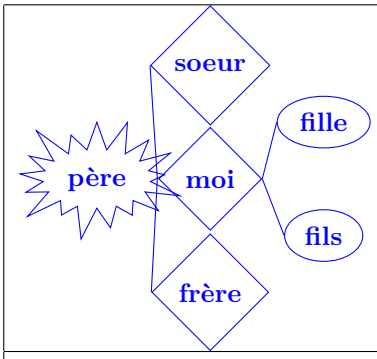
	
\node {père}[level 1/.style={level distance=1cm}]	\node {père}[level 2/.style={level distance=.5cm}]

28.5 Distance père fils

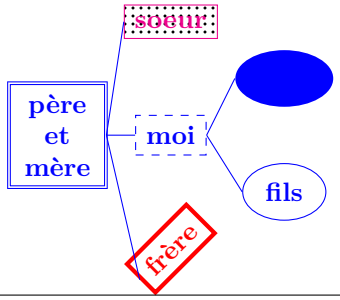
	
\node {père}[sibling distance=1cm,red]	\node {père}[sibling distance=3cm,red]
Par défaut : : sibling distance=15 mm	

Problème	solution
	
[sibling distance=2cm]	[level 1/.style=sibling distance=2cm, level 2/.style=sibling distance=1cm]

28.6 Personnalisation des noeuds

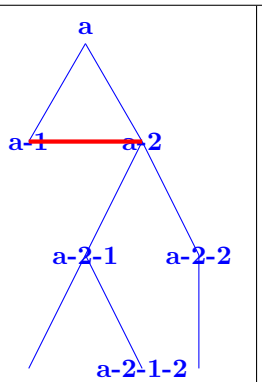



```
\node[starburst [1] ,draw] {père}[grow=right]

child {node[diamond,draw] frère}
child {node[diamond,draw] moi
child {node[ellipse,draw] fils}
child {node[ellipse,draw] fille}}
child {node[diamond,draw] soeur};
```



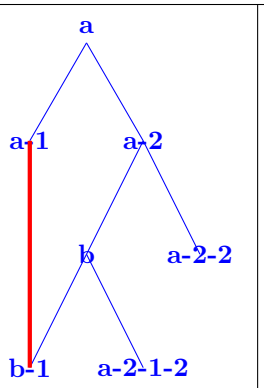

```
\node[rectangle,double,draw,text width=1cm,text centered]
{père}[grow=right,level distance=2cm]

child {node[red,ultra thick,draw,rotate=45] {frère}}
child {node[blue,dashed, draw] {moi}
child {node[ellipse,draw] {fils}}
child {node [ellipse,fill] {fille}}}
child {node [magenta,pattern=dots,draw] {soeur}};
```

28.6.1 Nom des noeuds

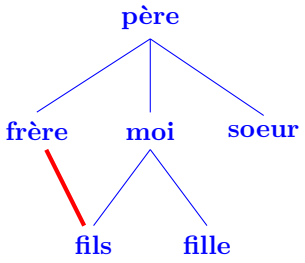



```
\node (a) {a}
child
child {
child {child child}
child {child }
};
\node at (a-1) {a-1};
\node at (a-2) {a-2};
\node at (a-2-2) {a-2-2};
\node at (a-2-1) {a-2-1};
\node at (a-2-1-2) {a-2-1-2};

\draw[red,ultra thick] (a-1) -- (a-2);
```

[1] autres types de nœuds voir section 17

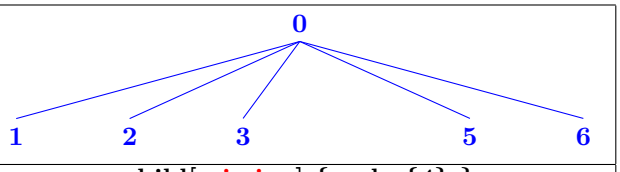



```
\node (a) {a}
child
child
child coordinate (b) child child
child
;
\node at (a-1) {a-1};
\node at (a-2) {a-2};
\node at (b) {b};
\node at (a-2-2) {a-2-2};
\node at (b-1) {b-1};
\node at (a-2-1-2) {a-2-1-2};

\draw[red,ultra thick] (a-1) -- (b-1);
```



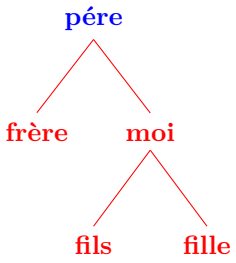

```
\node (a) {père}
child {node (b) {frère}}
child {node (c) {moi}
child {node (d) {fils}}
child {node (e) {fille}}}
child {node (f) {soeur}};

\draw[red,„ultra thick] (b) -- (d);
```

28.6.2 Omission d'un noeud

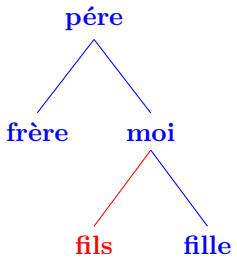



```
child[missing] {node {4} }
```

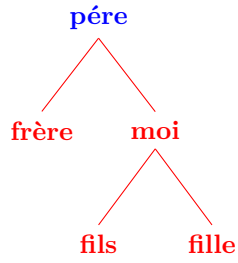
28.6.3 Modification du point d'accrochage



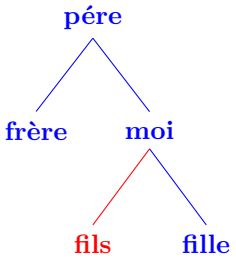

```
\node {pére} [child anchor=east,red]
child {node {frère}}
child { node {moi}
child {node {fils}}
child {node {fils}} };
```




```
\node {pére}
child {node {frère}}
child { node {moi}
child [child anchor=west,red] {node {fils}}
child {node {fils}} };
```

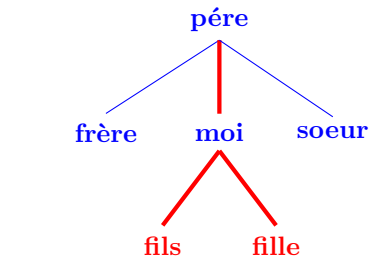



```
\node {père} [parent anchor=east,red]
child {node {frère}}
child { node {moi}
child {node {fils}}
child {node {fils}} };
```

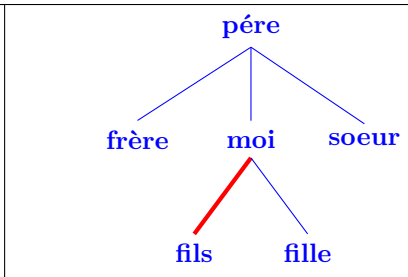



```
\node {père}
child {node {frère}}
child { node {moi}
child [parent anchor=west,red] {node {fils}}
child {node {fils}} };
```

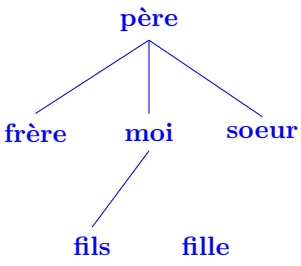
28.6.4 Liaison



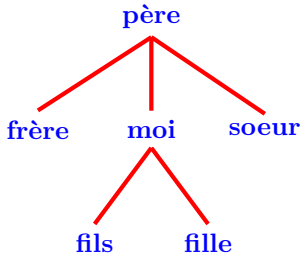

```
child {node {moi}
edge from parent[red,ultra thick]
```




```
child {node {fils}
edge from parent[red,ultra thick] }
```



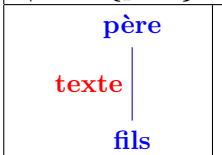

```
child { node {fille}
edge from parent[draw=none] }
```



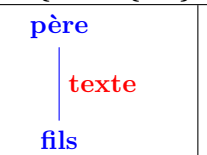

```
[edge from parent/.style={draw,red,ultra thick}]
\node {père}
```

28.6.5 Étiquetes sur liaisons

```
\node {père} child {node {fils} edge from parent node[left,red] {texte}};
```

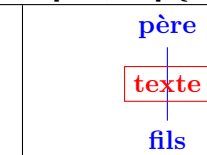


node[left,red]



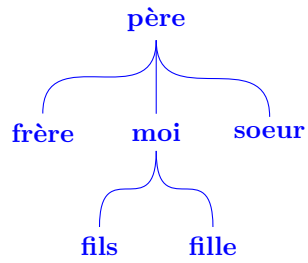
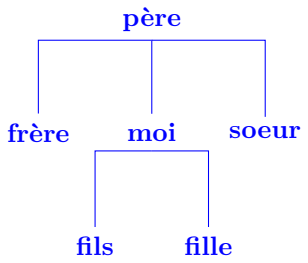
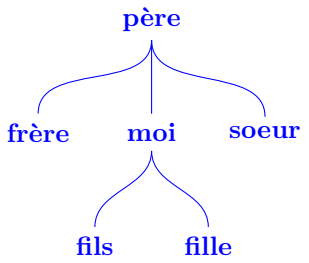
node[right,red]

node[near end,red]



node[draw,red]

28.6.6 Personalisation des liaisons

[edge from parent path= {(\tikzparentnode.south) .. controls +(0,-1) and +(0,1) .. (\tikzchildnode.north)}]		
		
.. controls +(0,-1) and +(0,1) ..	-|	to[in=90,out=-90]
voir liaison de noeuds section 7.6		

28.7 Options supplémentaires avec « library trees »

Charger l'extension: \usetikzlibrary{trees}

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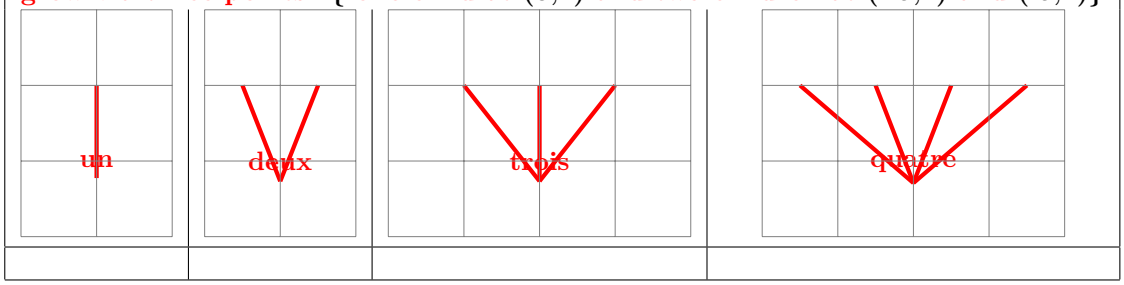
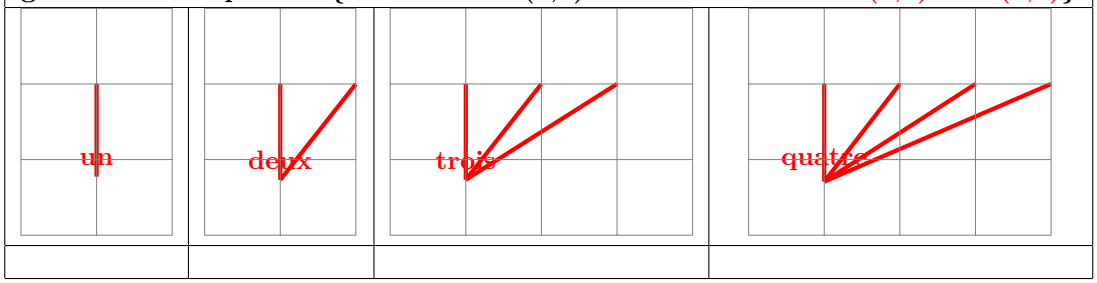
28.7.1 Positions d'un fils et de deux fils

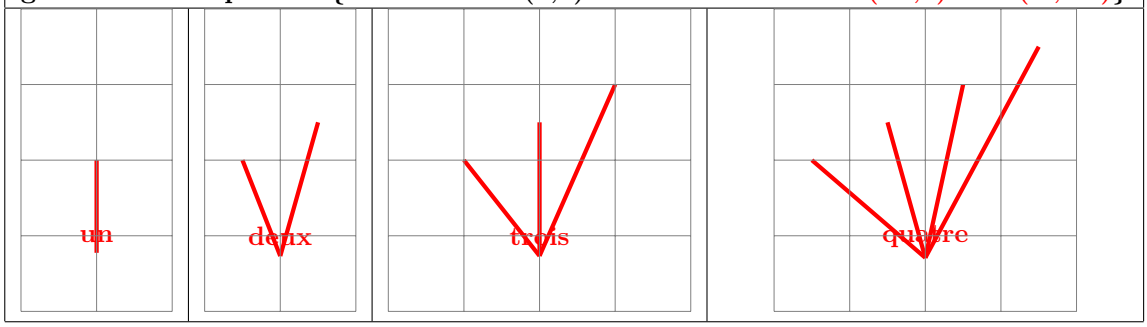
grow via three points={ one child at (0,1) and two children at (-.5,1) and (.5,1)}



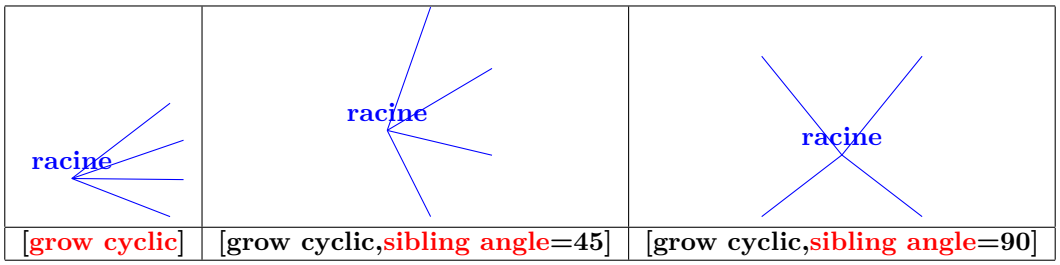
grow via three points={ one child at (0,1) and two children at (0,1) and (1,1)}



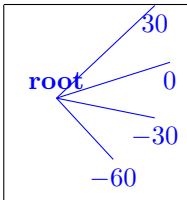
grow via three points={ one child at (0,1) and two children at (-.5,1) and (.5,1.5)}



28.7.2 Liaison angulaire

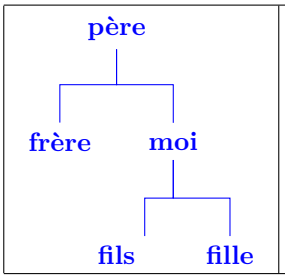


[grow cyclic] | [grow cyclic,sibling angle=45] | [grow cyclic,sibling angle=90]

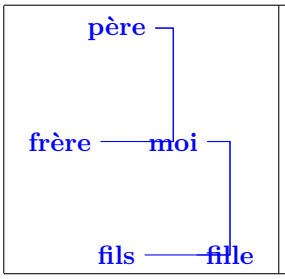



```
\node {racine} [clockwise from=30,sibling angle=30]

child {node {$30$} }
child {node {$0$} }
child {node {$-30$} }
child {node {$-60$ } };
```

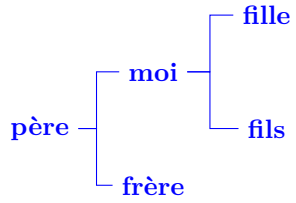
28.7.3 Liaisons en fourchette




```
\node {père} [edge from parent fork down]

child {node {frère}}
child {node {moi}
child [child anchor=north east] {node {fils}}
child {node {fille}}
};
```




```
\node {père} [edge from parent fork right]

child {node {frère}}
child {node {moi}
child {node {fils}}
child {node {fille}}
};
```




```
\node {père} [edge from parent fork right,grow=right]

child {node {frère}}
child {node {moi}
child {node {fils}}
child {node {fille}}
};
```

29 Les schemas électriques

Charger l'extension: \usepackage{circuits.ee.IEC}

29.1 Symboles

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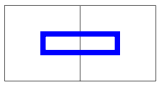
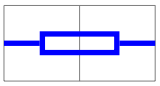
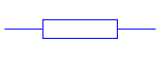
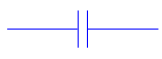
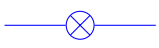
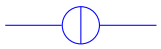
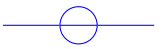
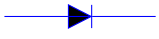
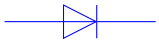
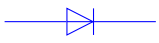
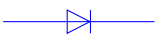
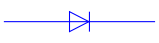
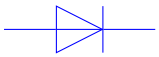
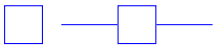
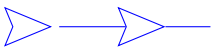
sur un noeud	sur un chemin
	
\node [circuit ee IEC] at (1,0.5) to [resistor] {} ;	\draw [circuit ee IEC](0,0.5) to [resistor] (2,.5) ;

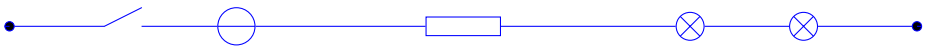
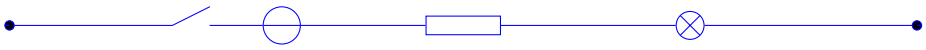
Composants de base			
\draw [circuit ee IEC] (0,.5) to [resistor] (2,.5) ;			
PGFmanual section : 47-4-3			
			
[resistor]	[inductor]	[capacitor]	[battery]
		 ;	
[bulb]	[current source]	[voltage source]	[ground]
PGFmanual section : 47-4-4			
			
[diode]	[Zener diode]	[Schottky diode]	[tunnel diode]
			
[backward diode]	[breakdown diode]		
PGFmanual section : 47-4-5			
			
[contact]	[make contact]	[break contact]	

Autre apparence		
\draw [circuit ee IEC,set resistor graphic=var resistor IEC graphic] (0,0.5) to [resistor] (2,0.5) ;		
		
resistor	inductor	diode
		
Zener diode	Schottky diode	tunnel diode
		
backward diode	breakdown diode	make contact

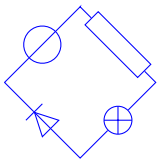
Taille des symboles PGFmanual section : 47-2-1				
\draw [circuit ee IEC] (0,0.5) to [diode,large circuit symbols] (2,0.5) ;				
				
huge circuit symbols	large circuit symbols	medium circuit symbols	small circuit symbols	tiny circuit s
(10pt)	(8pt)	(7pt)	(6pt)	(5pt)

\draw [circuit ee IEC,circuit symbol unit=14pt] (0,0.5) to [diode] (2,0.5) ;		
		
circuit symbol unit=14pt	circuit symbol size=width 3 height 1 ne fonctionne pas !	circuit symbol size=width 1 height 5

Création de nouveaux symboles PGFmanual section : 47-2-2			
	\begin{tikzpicture} [circuit declare symbol=xxx, set xxx graphic={draw,shape=rectangle,minimum size=5mm}] \node [xxx] at (.5,.5) ; \draw[circuit ee IEC] (1,.5) to [xxx] (3,.5) ; \end{tikzpicture}		
			
shape=circle	shape=dart	shape=star	shape=forbidden sign
voir les “different shape libraries”see the different shape libraries			

Placement des symboles sur un chemin
\draw [circuit ee IEC] (0,0.5) to [contact={at start},make contact={very near start},voltage source={near s resistor, bulb={near end}, bulb={very near end},contact={at end}] (12,0.5) ;

\draw [circuit ee IEC] (0,0.5) to [contact={ pos=0 },make contact={pos=0.2},voltage source={pos=0.3 resistor={ pos=0.5 }, bulb={pos=0.75 },contact={pos =1 }] (12,0.5) ;


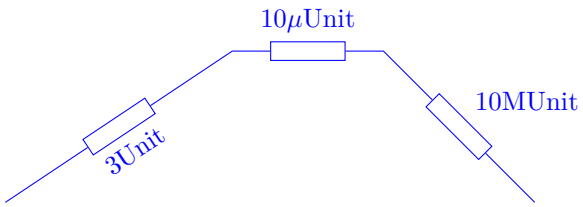
Orientation des symboles PGFmanual section : 47-2-3			
\node [circuit ee IEC] at (1,.5) [diode,point up] {} ;			
			
[diode,point up]	[diode,point down]	[diode,point left]	[diode,point right]

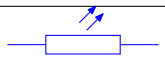
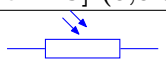
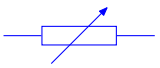
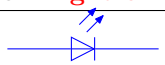
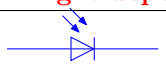
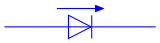
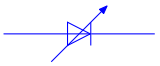
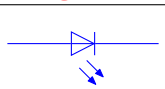
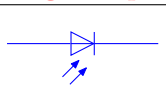
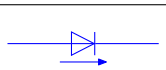
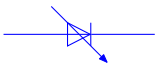
Orientation automatique	
	\draw [circuit ee IEC] (0,0) to [voltage source] (1,1) to [resistor] (2,0) to [bulb] (1,-1) to [diode] (0,0) ;

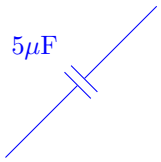
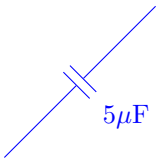
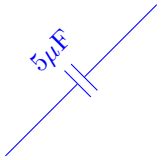
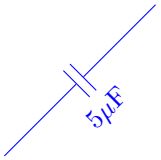
29.2 Annotations

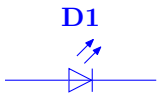
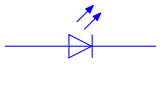
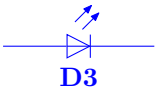
Sens du courant PGFmanual section : 47-4-2	
\draw [circuit ee IEC] (0,0.5) to [current direction] (2,0.5) ;	
[current direction]	[current direction']

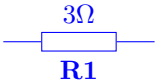
Unités disponibles PGFmanual section : 47-4-6				
\node [draw,circuit ee IEC] at(1,.5) [ampere=5] {}				
5A □	5V □	5 □	5S □	5H □
[ampere=5]	[volt=5]	[ohm=5] ne fonctionne pas !	[siemens=5]	[henry=5]
5F □	5C □	5VA □	5W □	5Hz □
[farad=5]	[coulomb=5]	[voltampere=5]	[watt=5]	[hertz=5]
5kA □	5mA □	5μA □	5kW □	5MW □
[ampere=5k]	[ampere=5m]	[ampere=5\mu]	[watt=5k]	[watt=5M]

créer sa propre unité PGFmanual section : 47-2-4
\tikz[circuit ee IEC,circuit declare unit={xxx}{ Unit}] \draw (0,0) to[resistor={xxx' sloped=3}] (3,2) to [resistor={xxx= 10\mu}] (5,2) to [resistor={xxx= 10M}]


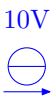
Annotations PGFmanual section : 47-4-7			
\draw [circuit ee IEC] (0,0.5) to [resistor=light emitting] (2,0.5) ;			
			
[resistor=light emitting]	[resistor=light dependent]	[resistor=direction info]	[resistor=adjustable]
			
[diode=light emitting]	[diode=light dependent]	[diode=direction info]	[diode=adjustable]
			
[diode=light emitting']	[diode=light dependent']	[diode=direction info']	[diode=adjustable']

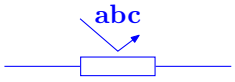
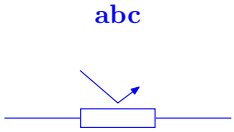
Position des unités PGFmanual section : 47-2-4	
\draw [circuit ee IEC] (0,0) to [capacitor={farad=5\mu}] (2,2) ;	
	
[capacitor={farad=5\mu}]	[capacitor={farad'=5\mu}]
	
[capacitor={farad sloped=5\mu}]	[capacitor={farad' sloped=5\mu}]

Informations PGFmanual section : 47-2-4		
\draw [circuit ee IEC] (0,0.5) to [diode={light emitting={info=D1}}] (2,0.5) ;		
		
[diode={light emitting={info=D1}}]	[diode={light emitting={info'=D2}}]	[diode={light emitting,info'

sur un noeud	sur un chemin
	
[resistor,info=3Ω,info'=R1]	[resistor={info=3Ω,info'=R1}]

	
[resistor,point up,info=center:3Ω]	[resistor,point up,info=center:3Ω]

\node [voltage source,direction info={volt=10}] {}		\node [voltage source,direction info'={volt=10}] {}	
			
{volt=10} ou {->,volt=10}	{volt'=10} ou {->,volt'=10}	{volt=10} ou {->,volt=10}	{volt'=10} ou {->,volt'=10}
			
{<-,volt=10}	{<-,volt=10}	{<-,volt=10}	{<-,volt'=10}

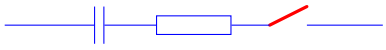
Créer sa propre annotation PGFmanual section : 47-2-5	
	\tikzset{circuit declare annotation={XXX}{9pt} { (-0.5cm,0.5cm) edge[to path={- -(0pt,2pt) - - (8pt,8pt)}] ()} } \tikz[blue,circuit ee IEC] \draw (0,0) to [resistor=XXX] (3,0);
	\tikzset{circuit declare annotation={xxx}{ 9pt } } { (-0.5cm,0.5cm) edge[to path={- -(0pt,2pt) - - (8pt,8pt)}] ()} } \tikz[blue,circuit ee IEC] \draw (0,0) to [resistor={xxx={info=abc}}] (3,0);
	\tikzset{circuit declare annotation={xxx}{1cm } } { (-0.5,0.5) edge[to path={- -(0pt,2pt) - - (8pt,8pt)}] ()} } \tikz[blue,circuit ee IEC] \draw (0,0) to [resistor={xxx={info=abc}}] (3,0);

Style des symboles

PGFmanual section : 47-2-6

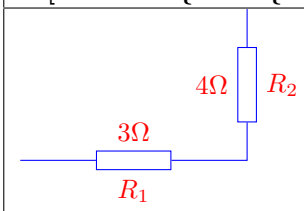
```
\draw[circuit symbol lines/.style={draw,red,very thick}] (0,0)
to [capacitor={near start},resistor, make contact={near end}] (5,0);
```

```
\draw[circuit symbol wires/.style={draw,red,very thick}] (0,0)
to [capacitor={near start},resistor, make contact={near end}] (5,0);
```

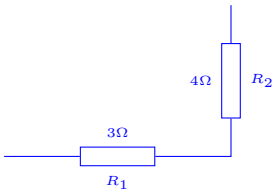


```
\draw[circuit symbol open/.style={thick,draw,red,fill=yellow}] (0,0)
to [capacitor={near start},resistor, make contact={near end}] (5,0);
```

```
\tikz[blue,circuit ee IEC,every info/.style=red]
\draw (0,0) to[resistor={info={$3\Omega$},info'={$R_1$}}] (3,0)
to[resistor={info={$4\Omega$},info'={$R_2$}}] (3,2);
```

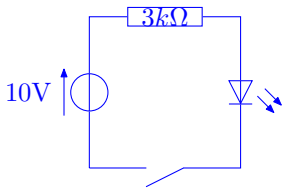
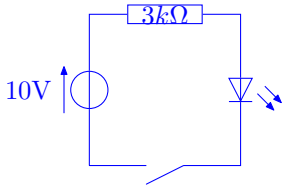
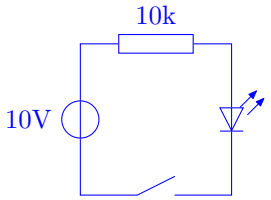


every info/.style=red



every info/.style={font=\tiny}

29.3 Exemple

3 méthodes pour le même schéma	
	\begin{tikzpicture}[blue,circuit ee IEC] \draw (0,0) to [voltage source={direction info={->,volt=10}}] (0,2) to [resistor={info=center:$3 k\Omega$}] (2,2) to [diode=light emitting] (2,0) to [make contact] (0,0); \end{tikzpicture}
	\begin{tikzpicture}[blue,circuit ee IEC] \draw (0,0) to [voltage source={direction info={->,volt=10}}] ++(up:2) to [resistor={info=center:$ 3 k\Omega$}] ++(right:2) to [diode=light emitting] ++(down:2) to [make contact] ++(left:2) ; \end{tikzpicture}
	\begin{tikzpicture}[blue,circuit ee IEC] \node (A) at (0,1) [voltage source,point up,volt=10]{}; \node (B) at (1,2) [resistor,ohm=10k] {}; \node (C) at (2,1) [diode=light emitting,point down] {} ; \node (D) at (1,0) [make contact] {}; \draw (A) |- (B) -| (C) |- (D) -| (A); \end{tikzpicture}

30 Les circuits logiques

International Electrotechnical Commission :

Charger l'extension: \usepackage{circuits.logic.IEC}

American logic gates :

Charger l'extension: \usepackage{circuits.logic.US}

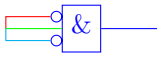
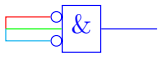
logic symbols used in A. Croft, R. Davidson, and M. Hargreaves (1992), Engineering Mathematics, Addison-Wesley, 82–95 :

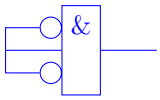
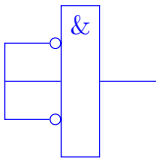
Charger l'extension: \usepackage{circuits.logic.CDH}

Composants de base		
\node [circuit logic IEC] at (1,.5) [and gate] {A} ; PGFmanual section : 47-3-2		
		
[circuit logic IEC] and gate	[circuit logic US] and gate	[circuit logic CDH] and gate
		
[circuit logic IEC] nand gate	[circuit logic US] nand gate	[circuit logic CDH] nand gate
		
[circuit logic IEC] or gate	[circuit logic US] or gate	[circuit logic CDH] or gate
		
[circuit logic IEC] nor gate	[circuit logic US] nor gate	[circuit logic CDH] nor gate
		
[circuit logic IEC] xor gate	[circuit logic US] xor gate	[circuit logic CDH] xor gate
		
[circuit logic IEC] xnor gate	[circuit logic US] xnor gate	[circuit logic CDH] xnor gate
		
[circuit logic IEC] not gate	[circuit logic US] not gate	[circuit logic CDH] not gate
		
[circuit logic IEC] buffer gate	[circuit logic US] buffer gate	[circuit logic CDH] buffer gate

Avec etiquette		
\node [circuit logic IEC] at (1,.5) [and gate] {A} ; PGFmanual section : 47-3-1		
		
[circuit logic IEC]	[circuit logic US]	[circuit logic CDH]

Orientation		
PGFmanual section : 47-3-1		
\node [circuit logic IEC] at (1,.5) [and gate,point down] {A} ;		
		
[circuit logic IEC]	[circuit logic US]	[circuit logic CDH]
\node [circuit logic IEC] at (1,.5) [and gate,point up] {A} ;		
		
[circuit logic IEC]	[circuit logic US]	[circuit logic CDH]
\node [circuit logic IEC] at (1,.5) [and gate,point left] {A} ;		
		
[circuit logic IEC]	[circuit logic US]	[circuit logic CDH]

Entrées sortie	
PGFmanual section : 47-3-3	
	\node [and gate IEC, draw, logic gate inputs={inverted ,normal , inverted }] at (1,.5) (A) {}; \draw [red] (A.input 1) -| (0,0.5); \draw[green] (A.input 2) -| (0,0.5); \draw[cyan] (A.input 3) -| (0,0.5); \draw (A.output) -| (2,0.5);
	\node [and gate IEC, draw, logic gate inputs={ini}] at (1,.5) (A) {}; \draw [red] (A.input 1) -| (0,0.5); \draw[green] (A.input 2) -| (0,0.5); \draw[cyan] (A.input 3) -| (0,0.5); \draw (A.output) -| (2,0.5);

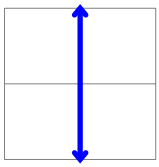
Paramètres des entrées	
\node [and gate IEC, draw, logic gate inputs=ini,logic gate inverted radius=4pt] at (1,.5) (A) {}; PGFmanual section : 47-3-3	
	
logic gate inverted radius=4pt	logic gate input sep=0.5cm

Paramètres des symboles		
\node [circuit logic IEC,and gate IEC symbol=AND] at (1,.5) [and gate] {} PGFmanual section : 47-3-5		
		
and gate IEC symbol =AND	logic gate IEC symbol color =red	logic gate IEC symbol align ={bottom, right}

Paramètres des composants		
\node [circuit logic IEC,very thick] at (1,.5) [and gate] {} PGFmanual section : 47-3-5		
		
very thick	fill=blue!10	fill=blue!10, logic gate IEC symbol color=black

31 Optique

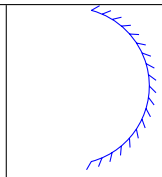
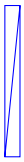
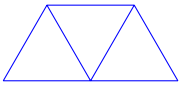
Charger l'extension: \usepackage{optics} [8]



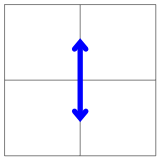
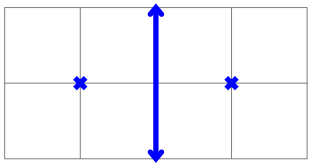
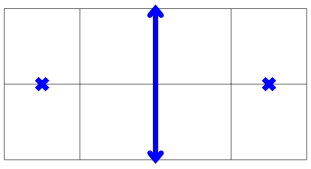
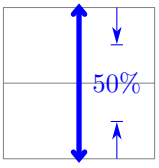
```
\begin{tikzpicture}[blue,line width=2pt]
\draw[help lines] (-1,-1) grid (1,1);
\node[use optics,lens] (L) at (0,0) ;
\end{tikzpicture}
```

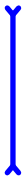
31.1 Éléments optiques

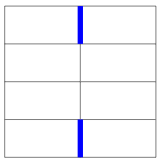
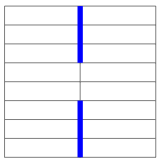
31.1.1 Éléments optiques disponibles

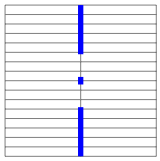
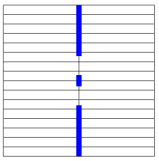
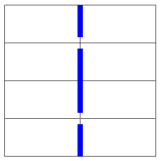
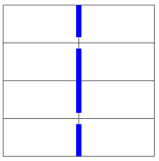
Éléments optiques			
\tikz[use optics,blue] \node[lens] (L) at (0,0) {};			
			
lens	slit	double slit	mirror
 			
convex mirror / concave mirror	polarizer	beam splitter	double amici prism
			
thin optics element	thick optics element	heat filter	screen
diffraction grating	grid	semi-transparent mirror	diaphragm

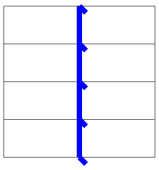
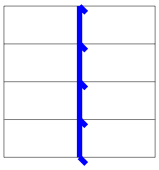
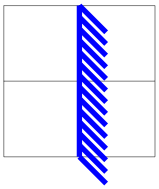
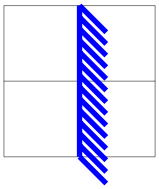
31.1.2 Paramètres

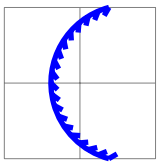
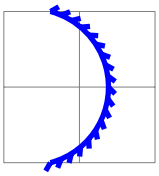
\node[lens,object height=1cm] (L) at (0,0) {};			
			
object height=1cm Par défaut : 2cm	draw focal points Par défaut : empty	focal length=1.5cm Par défaut : 1cm	focal height=0.5 Par défaut : 0.8 (80%)

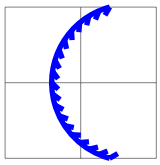
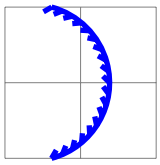
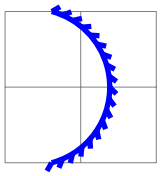
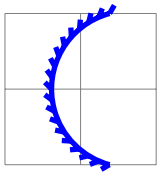
Lens type	
\node[lens,lens type=converging] (L) at (0,0) {};	
	
lens type=converging	lens type=diverging

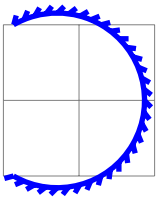
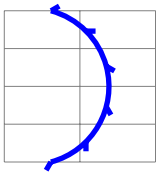
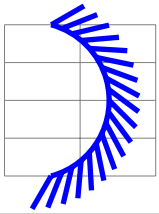
slit parameters	
\node[slit,slit height=0.5] (L) at (0,0) {};	
	
slit height=0.5	slit height=0.5cm
Par défaut : 0.075 (7.5%)	

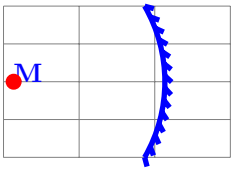
Double slit parameters			
\node[double slit,slit height=0.15] (L) at (0,0) {};			
			
slit height=0.15	slit height=0.25cm	slit separation=0.5	double slit, slit separation=1cm
Par défaut : 0.075 (7.5% x 2cm = 1.5 mm)		Par défaut : 0.2 (20% x 2cm = 4mm)	

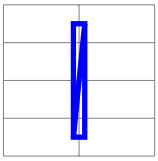
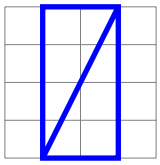
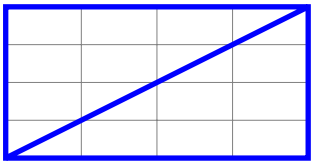
mirror parameters	
\node[mirror,mirror decoration separation=0.25] (L) at (0,0) {};	
	
mirror decoration separation=0.25	mirror decoration separation=0.5cm
Par défaut : 0.15cm	
	
mirror decoration amplitude=0.25	mirror decoration amplitude=1cm
Par défaut : 0.125cm	

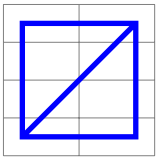
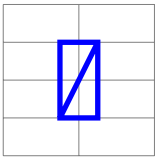
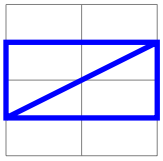
spherical mirror type	
\node[convex mirror](L) at (0,0) {};	
	
convex mirror	concave mirror
spherical mirror, spherical mirror type=convex	spherical mirror, spherical mirror type=concave

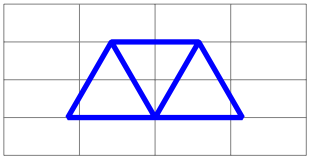
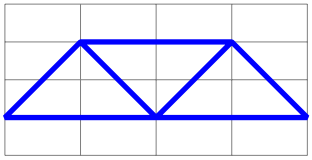
spherical mirror orientation	
\node[convex mirror, spherical mirror orientation=ltr](L) at (0,0) {};	
	
convex mirror, spherical mirror orientation=ltr	convex mirror, spherical mirror orientation=rtl
	
concave mirror spherical mirror orientation=ltr	concave mirror, spherical mirror orientation=rtl

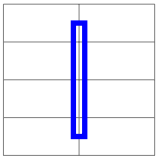
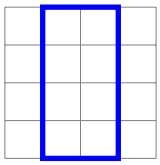
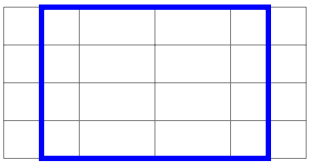
\node[spherical mirror, spherical mirror angle=240](L) at (0,0) {};		
		
spherical mirror angle=240	mirror decoration separation=0.25	mirror decoration amplitude=0.5cm
Par défaut : 150	Par défaut : 0.15cm	Par défaut : 0.125cm

\node[spherical mirror, spherical mirror angle=from_radius(2cm)](L) at (0,0) {};


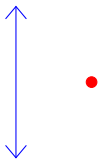
\node[polarizer, object height=1.5cm](L) at (0,0) {};		
		
object height=1.5cm	object aspect ratio=0.5	object aspect ratio=2
Par défaut : 2cm	Par défaut : 0.2	

\node[beam splitter,object height=1.5cm](L) at (0,0) {};		
		
object height=1.5cm	object aspect ratio=.5	object aspect ratio=2

\node[double amici prism,prism height=1cm](L) at (0,0) {};	
	
prism height=1cm	prism apex angle=90
Par défaut : 1.5cm	Par défaut : 60

\node[thick optics element,object height=1.5cm](L) at (0,0) {};		
		
object height=1.5cm	object aspect ratio=0.5	object aspect ratio=1.5

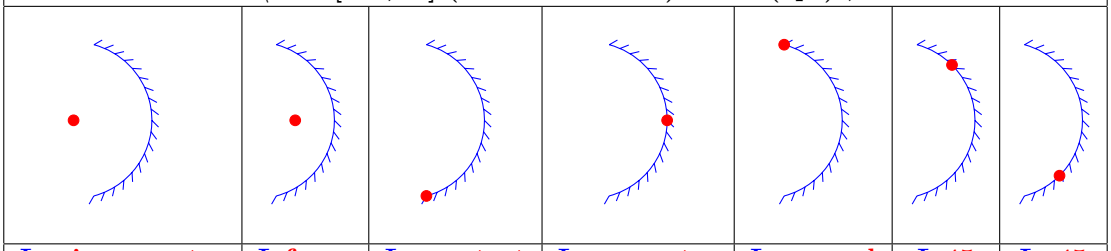
31.1.3 Ancres

\node[lens] (L) at (0,0) {} ; \node[red,fill] (L.lens north) circle (2pt) ;				
				
(L.lens north)	(L.lens south)	(L.east focus)	(L.west focus)	(L.center)

\node[slit, slit height=0.5] (L) at (0,0) {} ; \node[red,fill] (L.slit north) circle (2pt) ;		
		
(L.slit north)	(L.slit south)	(L.slit center)

\node[double slit,slit height=0.2,slit separation=0.5] (L) at (0,0) {} ; \node[red,fill] (L.slit 1 north) circle (2pt) ;					
					
(L.slit 1 north)	(L.slit 1 south)	(L.slit 1 center)	(L.slit 2 north)	(L.slit 2 south)	(L.slit 2 center)

\node[spherical mirror] (L) at (0,0) {} ;
\node[red,fill] (L.mirror center) circle (2pt) ;

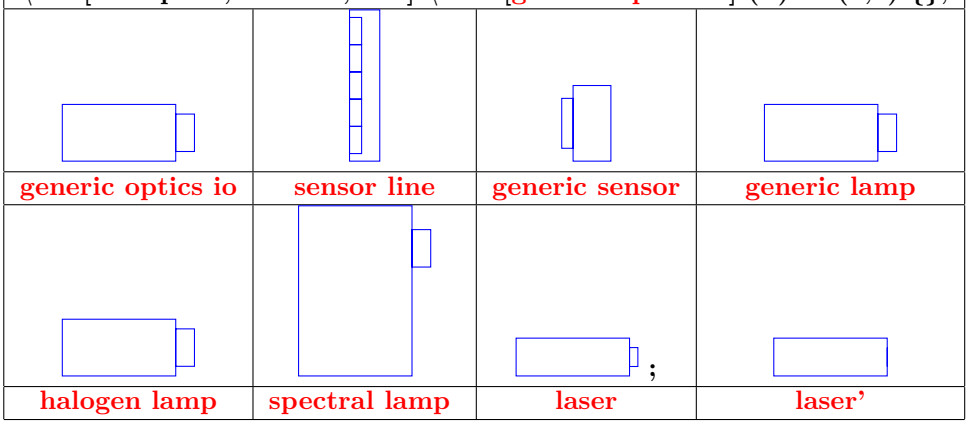


L.mirror center	L.focus	L.arc start	L.arc center	L.arc end	L.45	L.-45

31.2 Lampes et capteurs

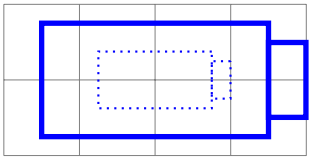
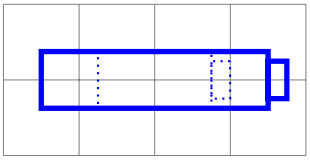
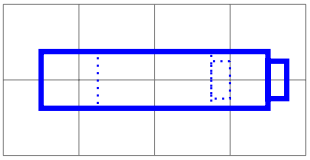
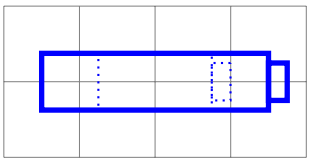
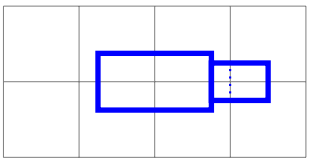
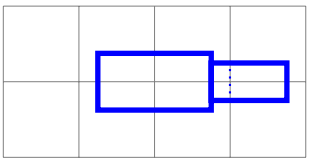
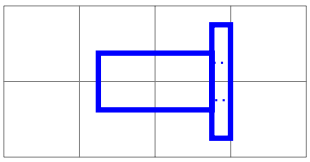
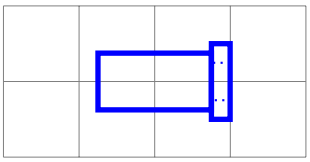
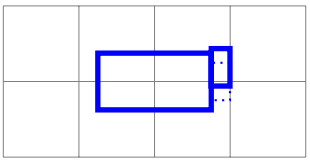
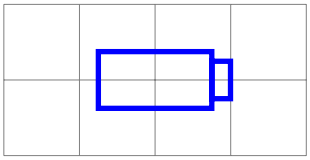
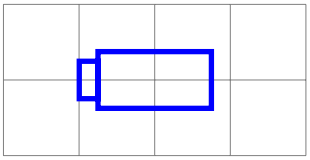
31.2.1 Disponibles

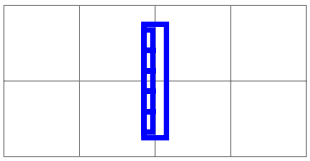
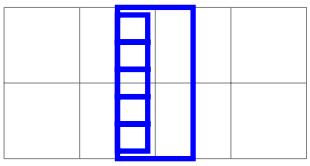
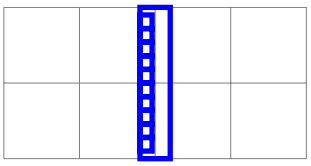
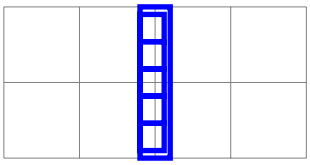
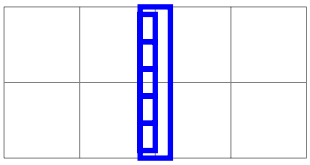
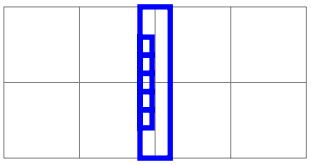
\tikz[use optics,scale=.5,blue] \node[generic optics io] (L) at (0,0) {};



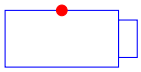
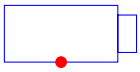
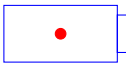
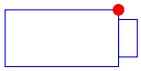
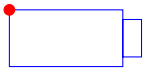
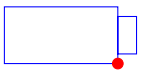
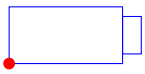
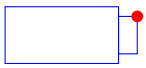
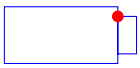
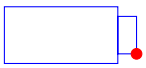
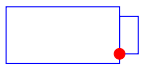
generic optics io	sensor line	generic sensor	generic lamp
halogen lamp	spectral lamp	laser ;	laser'

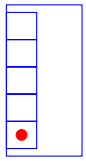
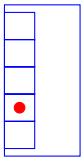
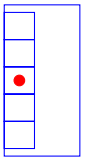
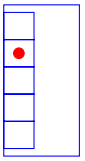
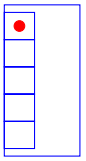
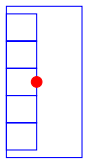
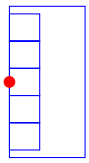
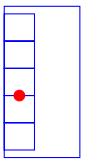
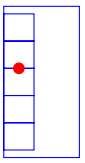
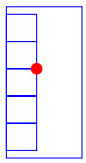
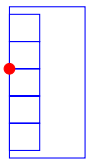
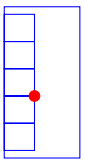
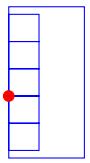
31.2.2 Paramètres

\node[generic optics io, io body height=1.5cm](L) at (0,0) {};		
Paramètres applicables pour generic sensor , generic lamp , halogen lamp , spectral lamp,laser		
		
io body height=1.5cm	io body aspect ratio=4	io body width=4
Par défaut : 0.75cm	Par défaut : 2	
		
io body width=3cm	io aperture width=1	io aperture width=1cm
	Par défaut : 0.33	
		
io aperture height=2	io aperture height=1cm	io aperture shift=0.25
Par défaut : 0.66		Par défaut : 0
		
io orientation=ltr	io orientation=rtl	
Par défaut : ltr		

\node[sensor line, sensor line height=1.5cm](L) at (0,0) {};		
		
sensor line height=1.5cm	sensor line aspect ratio=0.5	sensor line pixel number=10
Par défaut : 2cm	Par défaut : 0.2	Par défaut : 5
		
sensor line pixel width=0.8	sensor line pixel width=0.2cm	sensor line inner ysep=0.2
Par défaut : 0.4		Par défaut : 0.05

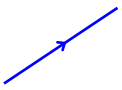
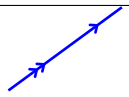
31.2.3 Points d'ancrages

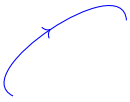
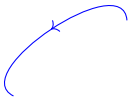
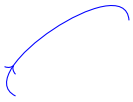
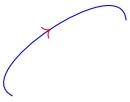
				
s.body north	s.body south	s.body east	s.body west	s.body cent
				
s.body north east	s.body north west	s.body south east	s.body south west	
				
s.aperture north	s.aperture south	s.aperture east	s.aperture west	s.aperture cer
				
s.aperture north east	s.aperture north west	s.aperture south east	s.aperture south west	

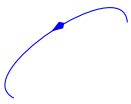
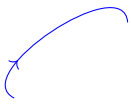
				
s.pixel 1 center	s.pixel 2 center	s.pixel 3 center	s.pixel 4 center	s.pixel 5 center
				
s.pixel 3 east	s.pixel 3 west	s.pixel 3 south	s.pixel 3 north	
				
s.pixel 3 north east	s.pixel 3 north west	s.pixel 3 south east	s.pixel 3 south west	

31.3 Outils

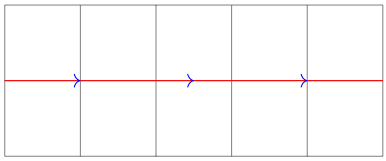
31.3.1 Marquer des rayons

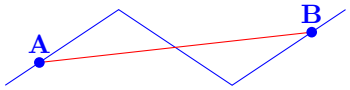
\draw [->-] (0,0) – (1.5,1;					
					
[->-]	[-<-]	[-> >-]	[->n-={n=4}]	[->n={n=5,at=0.25}]	[-> >-=at=0.25, ->-={at=0.75}]

\draw [put arrow] (0,0) to[bend left=120] (2,0);			
			
[put arrow]	[put arrow={arrow'}]	[put arrow={at=0.2}]	[put arrow={style=red}]

		
[red,put arrow={arrow=latex}]	[put arrow={arrow'=Kite}]	[put arrow={pos=.25}]
		Par défaut : pos=0.5

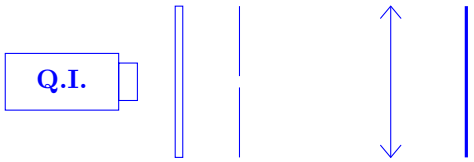
```
\draw[red, put arrow/every arrow/.style={blue}, put arrow={at=0.2},
put arrow={at=0.5}, put arrow={at=0.8}] (0,0) – (5,0);
```






```
\begin{tikzpicture}[use optics,blue]
\draw[put coordinate=A at 0.1,put coordinate=B at 0.9]
(0,0) - - (1.5,1) - - (3, 0) - - (4.5,1);
\draw[red] (A) - - (B);
\fill(A) circle (2pt) node[above] {A} ;
\fill(B) circle (2pt) node[above] {B} ;
\end{tikzpicture}
```

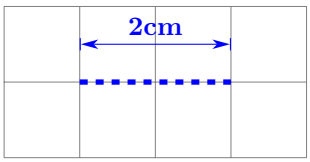
Point A à 10% , point B à 90%



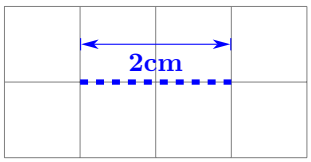

```
\begin{tikzpicture}[use optics]
\node[halogen lamp] (quartz iode) at (0,0) {Q.I.};
\node[heat filter,right=0.5cm of quartz iode.aperture east]
(AC) {};
\node[slit,right=0.75cm of AC] (fente) {};
\node[lens,right=2cm of fente] (L) {};
\node[screen,right=3cm of fente] (screen) {};
\end{tikzpicture}
```

31.3.2 Cotation

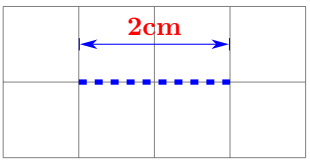
```
\draw (0,0) to[short dim arrow={label=2cm}] (2,0);
```



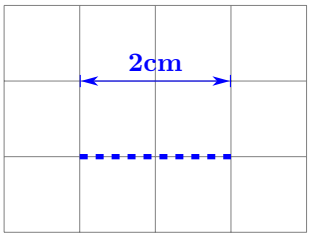
[dim arrow={label=2cm}]



to[dim arrow={label'=2cm}]

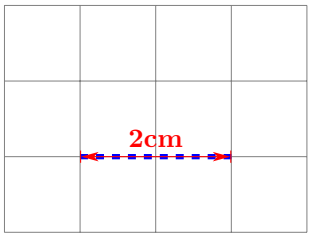


[dim arrow={label=2cm
label style/.append style=r

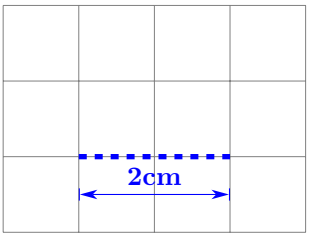


[dim arrow={label=2cm,raise=1cm}]

Par défaut : raise = 0.5cm

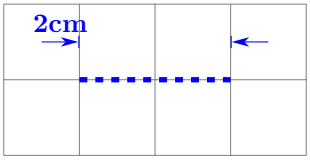


[dim arrow={label=2cm,no raise},red]

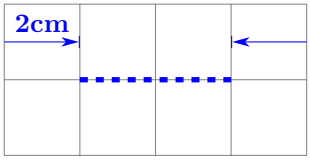


[dim arrow'={label=2cm

\draw (0,0) to[short dim arrow={label=2cm}] (2,0);

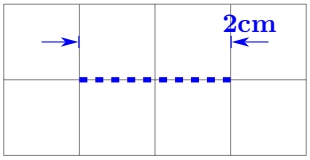


[short dim arrow={label=2cm}]

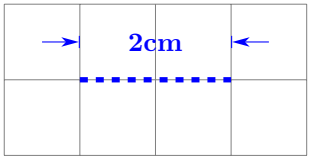


[short dim arrow={label=2cm,arrow length=1cm}]

Par défaut : arrow length= 5mm



[short dim arrow={label=2cm,label near end}]



[short dim arrow={label=2cm,label near middle}]

Par défaut : label near start

32 Les animations

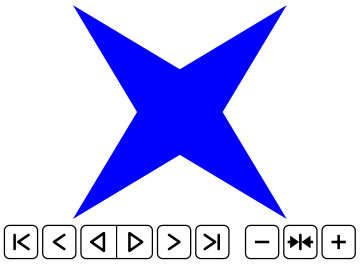
Charger l'extension: \usepackage{animate} [7]

32.1 Animation à partir de fichiers d'image

première image	seconde et dernière image
	
\includegraphics{XXX1}	\includegraphics{XXX2}

\animategraphics:	
[controls,	:boutons de contrôle
loop	:en boucle
autoplay]	:auto démarrage
{4}	:4 fois par seconde
{XXX}	:base du nom fichier
{1}	:numero de début
{2}	:numero de fin

32.2 Animateinline

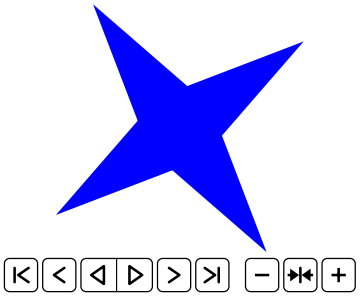


```
\begin{animateinline}[controls,loop,autoplay]{5}

% première image
\begin{tikzpicture}  \fill[blue] (45:2) - - (135:.5)- - (225:2)- -(315:.5)
- - cycle; \fill[blue] (45:.5) - - (135:2)- - (225:.5)- -(315:2) - - cycle;
\end{tikzpicture}
% deuxième
\newframe
\begin{tikzpicture}
\fill[blue] (0:2) - - (90:.5)- - (180:2)- -(270:.5) - - cycle;
\fill[blue] (0:.5) - - (90:2)- - (180:.5)- -(270:2) - - cycle;
\end{tikzpicture}

\end{animateinline}
```

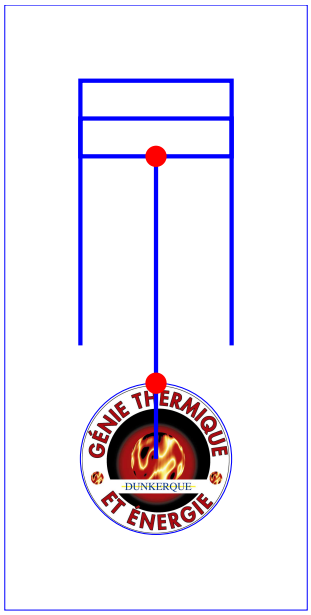
32.3 Multiframe



```
\begin{animateinline}[poster=first,controls, palindrome]{12}
\multiframe{29}{iAngle=80+10, Rdim=2.0+-0.2}{
\begin{tikzpicture}
\fill[blue] (\iAngle+45:\Rdim) - - (\iAngle+135:.5)- -
(\iAngle+225:\Rdim)- -(\iAngle+315:.5) - - cycle;
\fill[blue] (\iAngle+45:.5) - - (\iAngle+135:\Rdim)- - (\iAn-
gle+225:.5)- -(\iAngle+315:\Rdim) - - cycle;
\end{tikzpicture} }
\end{animateinline}
```

L'initiale de la variable définit son type

entier	initiale : i ou I
réelles	initiale : n, N, r ou R
longueurs	initiale : d ou D




```
\begin{animateinline}[autoplay,loop]{12}
\multiframe{24}{iAngle=0+15,icol=0+5}{\begin{tikzpicture}
\draw[line width=0pt] (-2,-3) rectangle(6,3);
\draw (0,0) node[fill=white,circle,rotate=\iAngle]
{\includegraphics[width=2cm]{LogoIUT}} (0,0) circle (1);
\draw (0,0) circle (1);
\coordinate (abc) at (${sqrt(9-sin(\iAngle)*sin(\iAngle))+cos(\iAngle)}*(1,0)$)
;
\coordinate (xyz) at (\iAngle:1);
\draw[ultra thick] (0,0) - -(xyz);
\draw[ultra thick] (xyz) - - (abc) ;
\fill[color=blue!\icol] (abc)++(0.5,-1) rectangle (5,1) ;
\draw[ultra thick] (abc) ++(0,-1) rectangle ++(.5,2) ;
\draw[ultra thick] (1.5,1) - - (5,1) - - (5,-1) - - (1.5,-1);
\fill[red] (xyz) circle (4pt);
\fill[red] (abc) circle (4pt);
\end{tikzpicture}}
\end{animateinline}
```

33 Les modules étudiés dans ce document

module de base TikZ :		
nom	**A insérer dans le préambule**	**documentation** [1]
tikz	\usepackage{tikz}	**pgfmanual.pdf**

Autres modules		
nom	**voir page**	**documentation** [2]
animate	**215**	**animate.pdf**
tikz-optics	**205**	**tikz-optics.pdf**
pgfplots	**165**	**pgfplots.pdf**
tikzpeople	**142**	**tikzpeople.pdf**
tikzducks	**149**	**tikzducks-doc.pdf**
tikzsymbols	**155**	**tikzsymbols.pdf**
tkz-tab	**176**	**tkz-tab-screen.pdf**

Compléments optionnels (documentation : pgfmanual.pdf)		
nom	**voir page**	**A insérer dans le préambule**
angles	**37**	**\usetikzlibrary{angles}**
arrows.meta	**21**	**\usetikzlibrary{arrows.meta}**
bending	**34**	**\usetikzlibrary{bending}**
backgrounds	**79**	**\usetikzlibrary{backgrounds}**
calc	**45**	**\usetikzlibrary{calc}**
chains	**67**	**\usetikzlibrary{chains}**
circuits.ee.IEC	**195**	**\usetikzlibrary{circuits.ee.IEC}**
circuits.logic.IEC	**201**	**\usetikzlibrary{circuits.logic.IEC}**
circuits.logic.US	**201**	**\usetikzlibrary{circuits.logic.US}**
circuits.logic.CDH	**201**	**\usetikzlibrary{circuits.logic.CDH}**
fit	**58**	**\usetikzlibrary{fit}**
decorations.footprints	**129**	**\usetikzlibrary{decorations.footprints}**
decorations.fractals	**136**	**\usetikzlibrary{decorations.fractals}**
decorations.markings	**126**	**\usetikzlibrary{decorations.markings}**
decorations.pathmorphing	**114**	**\usetikzlibrary{decorations.pathmorphing}**
decorations.pathreplacing	**121**	**\usetikzlibrary{decorations.pathreplacing}**
decorations.shapes	**130**	**\usetikzlibrary{decorations.shapes}**
decorations.text	**134**	**\usetikzlibrary{decorations.text}**
fadings	**84**	**\usetikzlibrary{fadings }**
intersections	**43**	**\usetikzlibrary{intersections}**
matrix	**64**	**\usetikzlibrary{matrix}**
patterns	**17**	**\usetikzlibrary{patterns}**
plotmarks	**164**	**\usetikzlibrary{plotmarks}**
positioning	**56**	**\usetikzlibrary{positioning}**
scopes	**76**	**\usetikzlibrary{scopes}**
shadings	**20**	**\usetikzlibrary{shadings}**
shapes.arrows	**96**	**\usetikzlibrary{shapes.arrows}**
shapes.callouts	**98**	**\usetikzlibrary{shapes.callouts}**
shapes.geometric	**91**	**\usetikzlibrary{shapes.geometric}**
shapes.misc	**100**	**\usetikzlibrary{shapes.misc}**
shapes.multipart	**102**	**\usetikzlibrary{shapes.multipart}**
shapes.symbols	**94**	**\usetikzlibrary{shapes.symbols}**
through	**60**	**\usetikzlibrary{through}**
trees	**193 \usetikzlibrary{trees}**	
through	**184**	**\usetikzlibrary{turtle}**

[1] voir dans le répertoire : \texlive\2016\tesmf-dist\doc\generic\pgf
[2] chercher dans le répertoire : \texlive\2016\tesmf-dist\doc\latex

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examples graph drawing library	PGFmanual section : 35-8
external	PGFmanual section : 50
fixedpointarithmetic	PGFmanual section : 53
folding	PGFmanual section : 59
force graph drawing library	PGFmanual section : 31
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graph.standard library	PGFmanual section : 19-10
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trees graph drawing library	

References

[1] **pgfmanual.pdf** **version 3.0.1a** **1161 pages** 

[2] **pgfplots.pdf** **version 1.80** **439 pages** 

[3] **tkz-tab-screen.pdf** **version 1.1c** **83 pages** 

[4] **tikzpeople.pdf** **19 pages** 

[5] **tikzducks-doc.pdf** **version 0.6** **28 pages** 

[6] **tikzsymbols.pdf** **version sept 2017** **15 pages** 

[7] **animate.pdf** **26 pages** 

[8] **tikz-optics.pdf** **version 0.2.2** **39 pages**