Visuel Tikz

Version 0.40

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Objectif :
— Une image par commande ou par paramètre.
— Le texte réduit au strict minimum.
— 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 concernés. Voir la documentation pour aller plus loin

Source documentaire : pgfmanual.pdf pour commencer. La liste complète des sources se trouve page 88.

Pour me contacter Vous pouvez me contacter à mon e-mail personnel pour
— me signaler les erreurs que vous avez constatés
— me faire part de vos commentaires, suggestions …

Merci à :
Till Tantau

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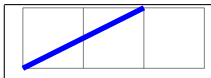
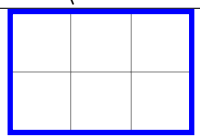
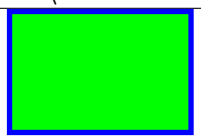
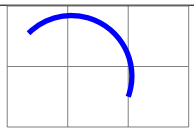
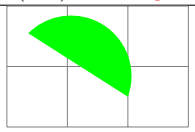
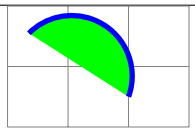
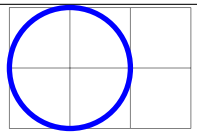
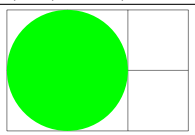
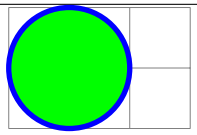
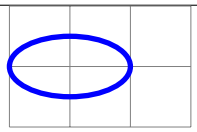
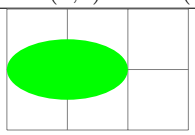
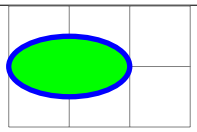
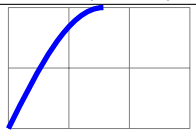
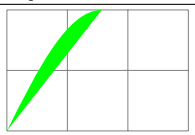
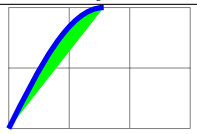
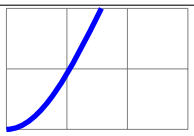
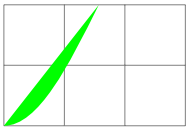
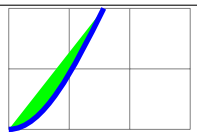
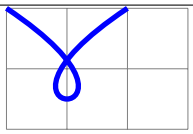
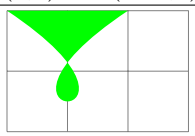
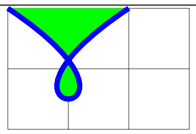
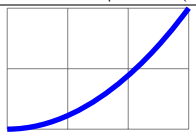
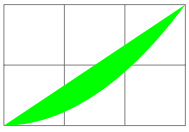
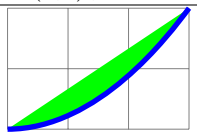
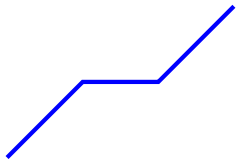
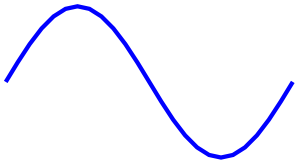
1 Les figures de base

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

\draw	**\fill**	**\filldraw**
		
\draw (0,0) rectangle (3,2) ;		
		
\draw (2,1) arc (-20 :135 :1) ;		
		
\draw (1,1) circle (1) ;		
		
\draw (1,1) ellipse [x radius=1cm,y radius=.5cm] ;		
		
\draw	\fill	\filldraw
\draw (0,0) sin (1.57,2) ;		
		
\draw (0,0) cos (1.57,2) ;		
		
\draw (0,2) . . controls (3,0) and (-1,0) .. (2,2) ;		
		
\draw (0,0) parabola (3,2) ;		

1.1 Dessin avec plot

une liste de coordonnées	un fichier de coordonnées	une équation mathématique
		
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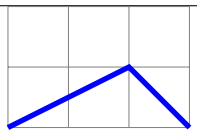
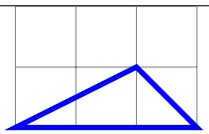
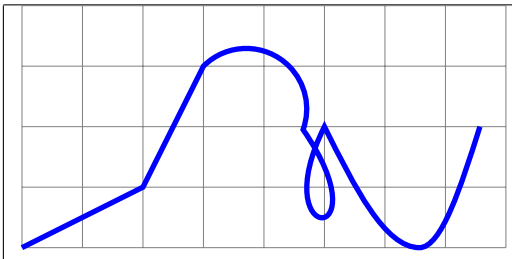
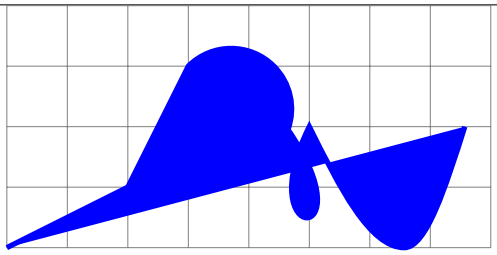
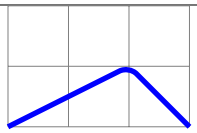
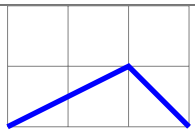
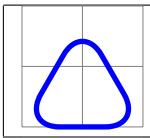
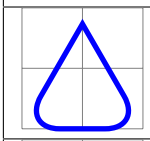
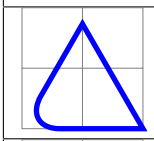
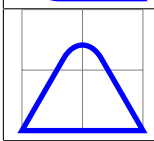
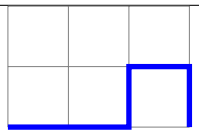
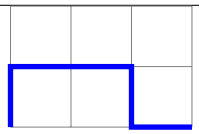
1.2 Path

	
\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 [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 ;

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

2 Les paramètres disponibles

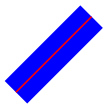
2.1 Épaisseur de ligne

\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)

2.2 Style de ligne

\tikz \draw[solid,ultra thick] (0,0) - - (1,1) ;			
[solid]	[dotted]	[densely dotted]	[loosely dotted]
[dashed]	[densely dashed]	[loosely dashed]	[dashdotted]
[densely dashdotted	[loosely dashdotted	[dashdotdotted	[densely dashdotdotted]
[loosely dashdotdotted]			

[dash pattern=on .5cm off .3cm on 5pt off 5 pt]
[dash pattern=on .5cm off .3cm on 5pt off 5pt,dash phase=10pt]

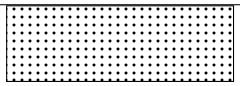
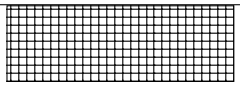
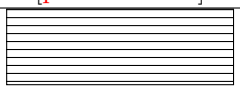
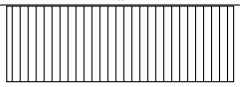
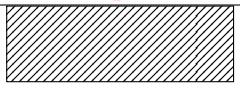
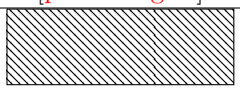
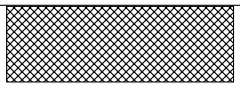
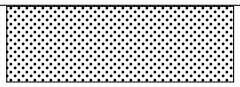
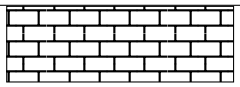
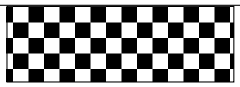
\tikz \draw[line width=.2cm,double] (0,0) - - (1,1) ;			
			
double	draw=blue,double=red	double distance=.3cm	double distance between line centers=.3cm

\Huge = \tikz \draw[baseline,blue,double equal sign distance] (0,0) - - (1,1) ;	
	=
\Huge	\large

2.3 Remplissage

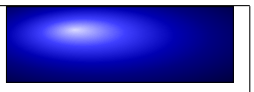
Insérer dans le préambule :

\usetikzlibrary{patterns}

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

2.4 Ombrage

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

		
[shading=axis]	[shading=radial	[shading=ball]

[left color=red]	[right color=blue]	left color=red,right color=blue

[left color=red]	[right color=blue]	left color=red,shading angle=45

2.5 Les extrémités

2.5.1 Chargé automatiquement avec Tikz

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

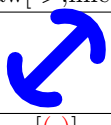
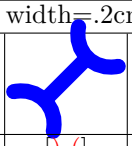
2.5.2 Options supplémentaires avec « library arrow »

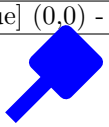
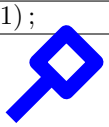
Insérer dans le préambule :

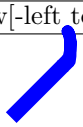
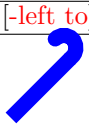
```
\usetikzlibrary{arrow}
```

\tikz \draw[-triangle 90,line width=.2cm,blue] (0,0) - - (1,1) ;			
[-triangle 90]	[-triangle 90 reversed]	[-open triangle 90]	[-open triangle 90 reversed]
[-triangle 60]	[-triangle 60 reversed]	[-open triangle 60]	[-open triangle 60reversed]
[-triangle 45]	[-triangle 45 reversed	[-open triangle 45]	[-open triangle 45 reversed]

\tikz \draw[-angle 90,line width=.2cm,blue] (0,0) - - (1,1) ;			
[-angle 90]	[-angle 90 reversed]	[-angle 60]	[-angle 60 reversed]
[-angle 45]	[-angle 45 reversed]	[-hooks]	[-hooks reversed]

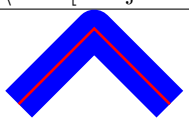
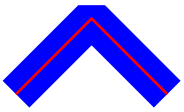
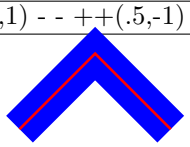
\tikz \draw[->,line width=.2cm,blue] (0,0) - - (1,1) ;			
			
[- [	[(-)]	[)-(]	

\tikz \draw[-*,line width=.2cm,blue] (0,0) - - (1,1) ;				
				
[-*]	[-diamond]	[-open diamond]	[-square]	[-open square]

\tikz \draw[-left to,line width=.2cm,blue] (0,0) - - (1,1) ;			
			
[-left to]	[-left to reversed]	[-right to]	[-right to reversed]
			
[-left hook	[-left hook reversed]	[-right hook]	[-right hook reversed]

\tikz \draw[-round cap,line width=.2cm,blue] (0,0) - - (1,1) ;			
[-round cap]	[-butt cap]	[-triangle 90 cap]	[-triangle 90 cap reversed]
[-fast cap]	[-fast cap reversed]		

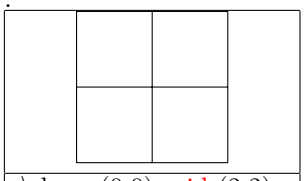
2.6 Jonction de lignes

\draw[line join=round] (0,0) - - ++(.5,1) - - ++(.5,-1) ;		
		
[line join=round	[line join=bevel]	[line join=miter]

3 Les coordonnées

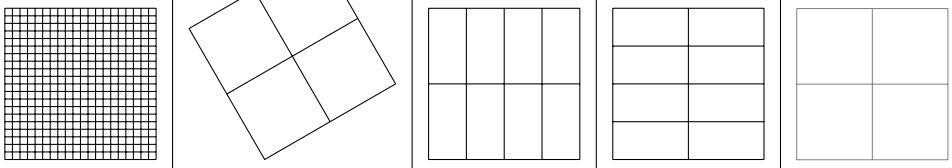
3.1 Quadrillage

:



```
\draw (0,0) grid (2,2) ;
```

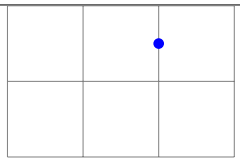
```
\tikz \draw [step=1mm] (0,0) grid (2,2) ;
```



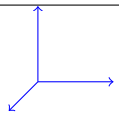
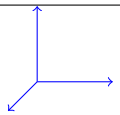
[step=1mm]	[rotate=30]	[xstep=.5]	[ystep=.5]	[help lines]

3.2 Coordonnées

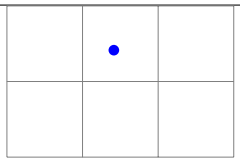
3.2.1 Système de coordonnées « canvas »


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

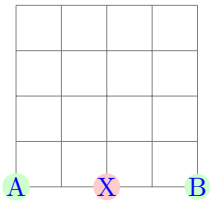
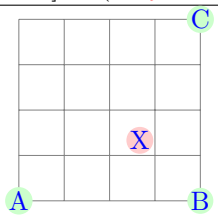
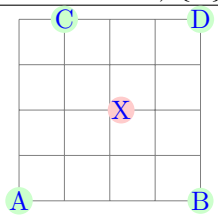
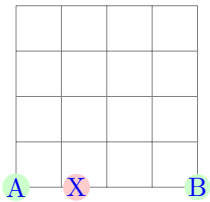
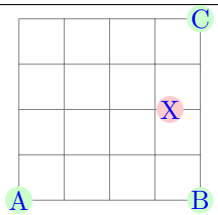
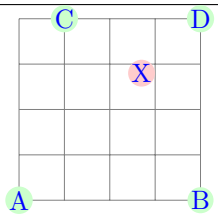
3.2.2 Système de coordonnées xyz

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

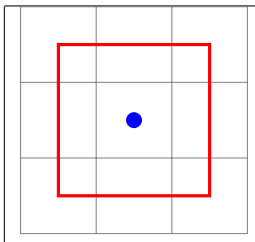
3.2.3 Système de coordonnées polaire « canvas »


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

3.2.4 Coordonnées barycentriques

\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

3.3 Coordonnées nominatives : nœud



```
\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) ;
```

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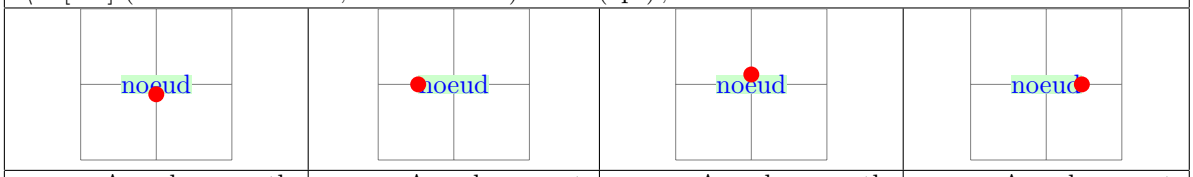
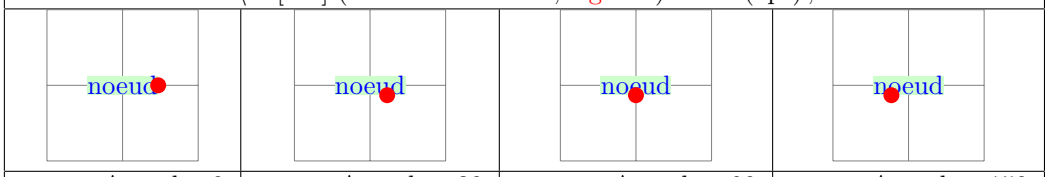
3.3.1 Coordonnées relatives à un noeud

```
\node [fill=green !20,] (A) at (1,1) {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

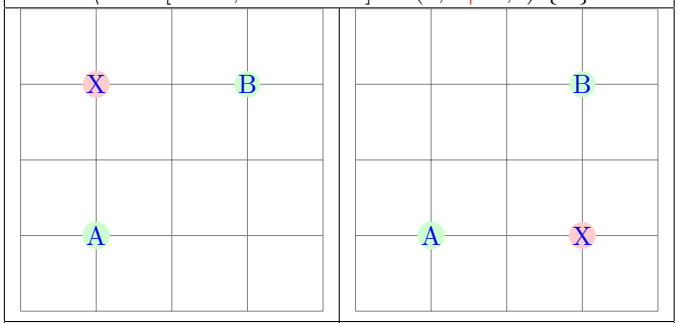
```
\fill[red] (node cs :name=A,angle=0) circle (3pt) ;
```



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

3.3.2 Coordonnées relatives à 2 points

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

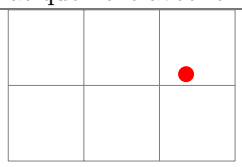


at (1,1 |- 3,3)	at (1,1 -| 3,3)

3.4 Position calculée

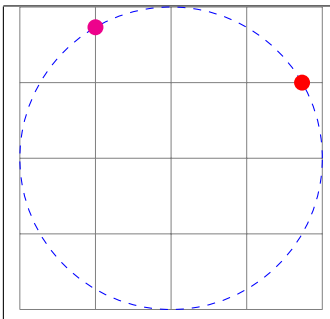
3.4.1 Position calculée avec le module « pgfmath »

Ce module est chargé automatiquement avec le module Tikz



Explicite : \fill [red] (canvas cs :x=2cm+10pt,y=1.5cm-10pt) circle (3pt) ;

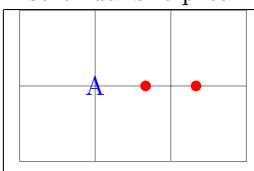
Implicite : \fill [red] (2cm+10pt,1.5cm-10pt) circle (3pt) ;



```
\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) ;
```

3.4.2 Position calculée avec « librairy calc »

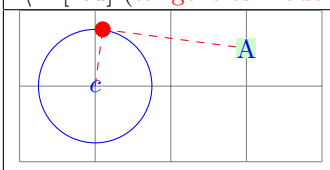
Insérer dans le préambule : \usetikzlibrary{calc}



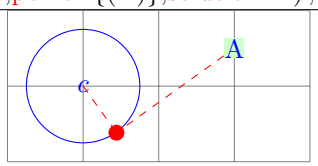

```
\node (a) at (1,1) {A} ;
\fill [red] ($(a) + 2/3*(1cm,0)$) circle (2pt) ;
\fill [red] ($(a) + 4/3*(1cm,0)$) circle (2pt) ;
```

3.4.3 Tangentes avec « librairy calc »

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



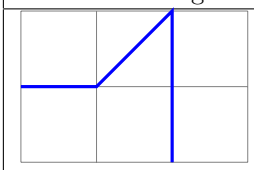
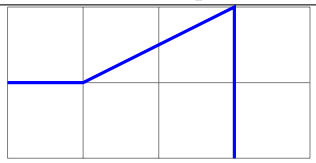
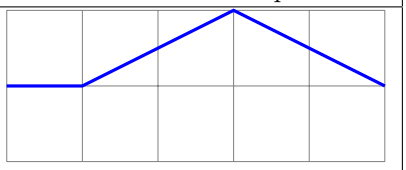
solution=1



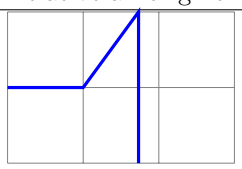
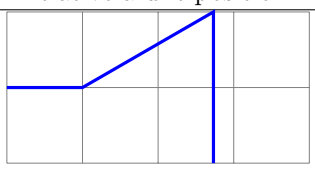
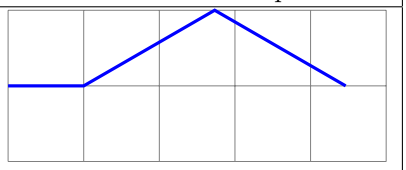
solution=2

3.5 Coordonnées relatives

3.5.1 Cartésienne

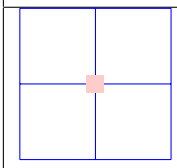
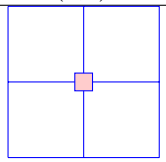
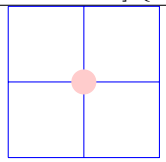
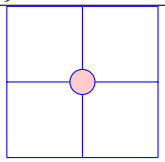
relative à l'origine	relative à une position	relative à la dernière position
		
(0,0) - - (1,0) - - (2,1) - - (2,-1)	(0,0) - - (1,0) - - +(2,1) - - +(2,-1)	(0,0) - - (1,0) - - ++(2,1) - - ++(2,-1)

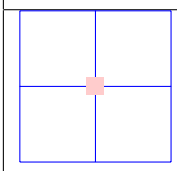
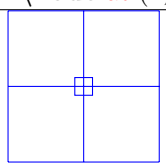
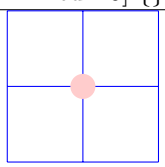
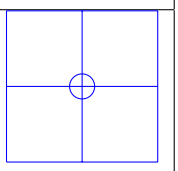
3.5.2 Polaire

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)

4 Les nœuds

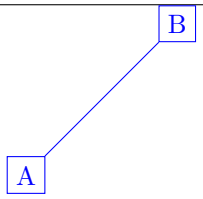
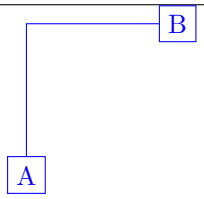
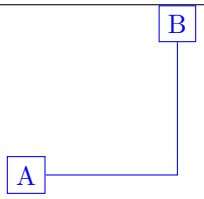
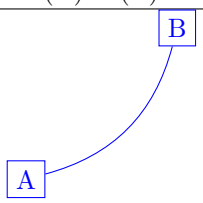
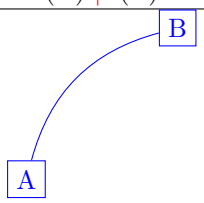
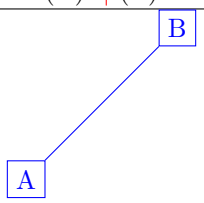
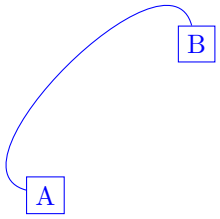
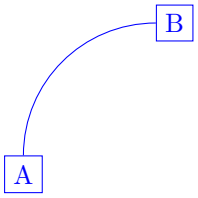
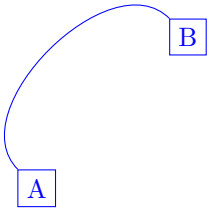
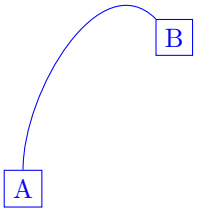
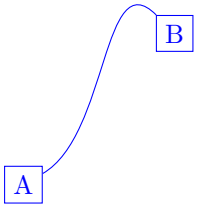
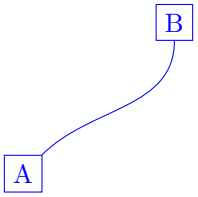
4.1 Définition des nœuds

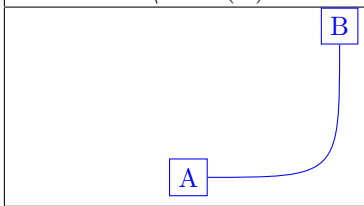
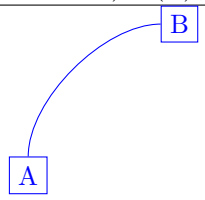
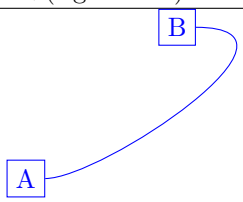
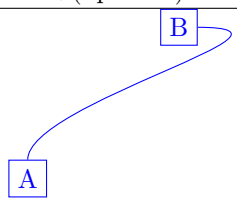
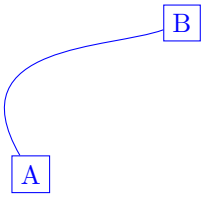
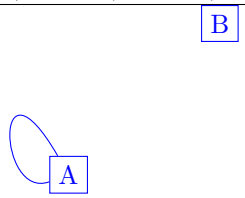
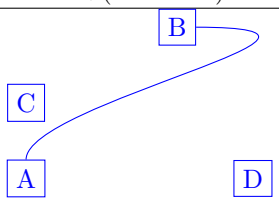
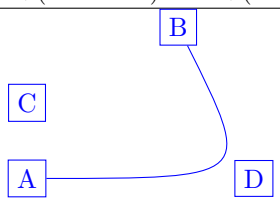
\draw (1,1) node[fill=red !20] {texte} ;			
			
Par défaut	node[draw]	node[circle]	node[circle,draw]

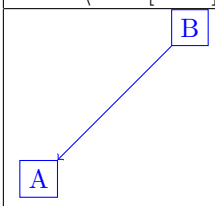
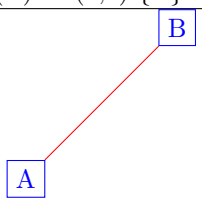
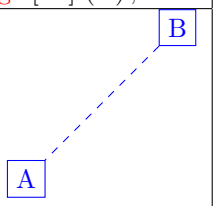
\node at (1,1) [fill=red !20] {} ;			
			
[fill=red !20]	[draw]	[circle,fill=red !20]	[circle,draw]

Autres types de nœuds voir page 30

4.2 Liaisons

		
(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] (B) at (2,2) {B} edge [->] (A) ;		
		
[->]	[red]	[dashed]

4.3 Étiquettes sur les nœuds

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

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

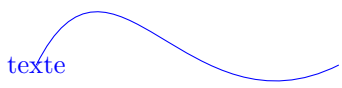
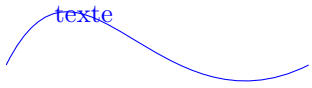
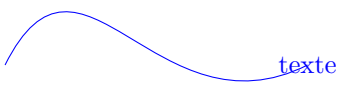
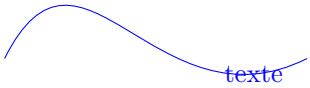
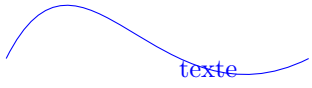
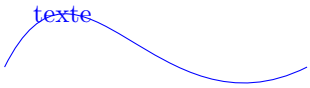
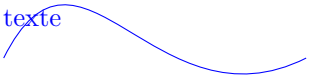
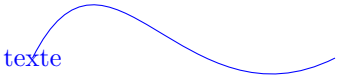
\fill(0,0) circle (2pt) node[below right=.3cm,draw,label=45 :étiquette] {texte} ;
étiquette texte

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	

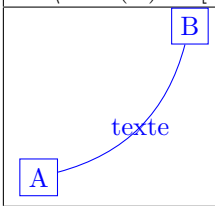
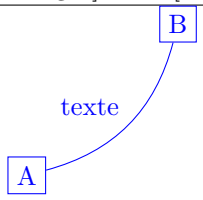
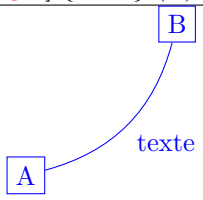
1. désactivation et ré-activation de « : »conflit entre les modules Tikz et Babel en français

4.4 Nœuds sur un chemin

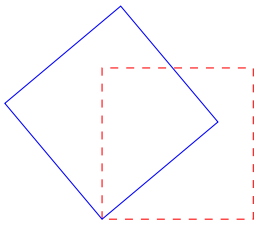
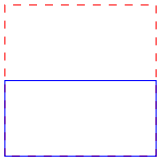
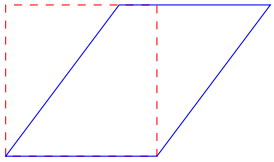
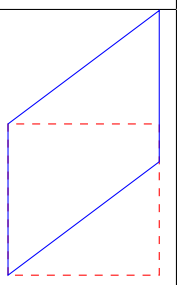
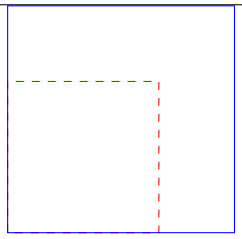
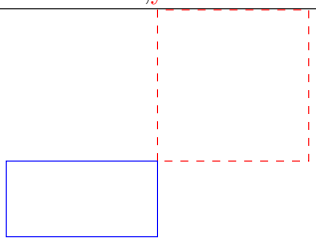
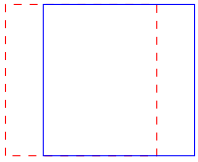
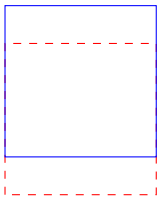
\draw(0,0) .. controls (1,2) and (2,-1) .. (4,0) node[at end] {texte} ;		
		
pos=0	pos=.33	at end (pos=1)
		
very near end (pos=0.875.)	near end (pos=0.75)	midway (pos=0.5)
		
near start (pos=0.25)	very near start (pos=0.125)	at start (pos=0)

\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]

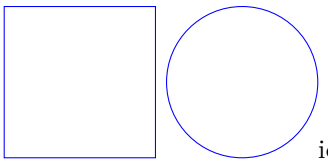
5 Constructions particulières

\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

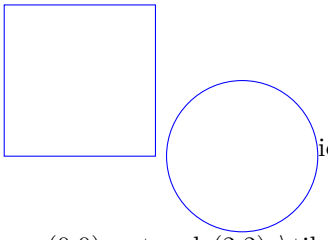
6 Placer son dessin

6.1 Dans le texte

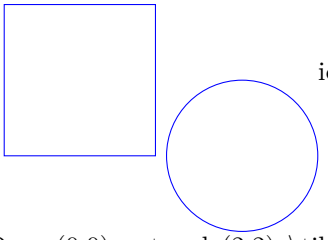
6.1.1 Sans option de décalage

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

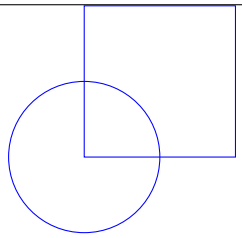
6.1.2 Avec décalage nul

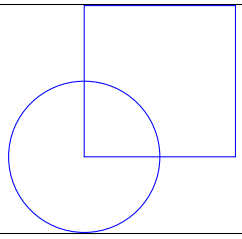
dessin directement dans le texte  ici est inclus le code suivant : \tikz[baseline=0pt] \Draw (0,0) rectangle(2,2) ;\tikz[baseline=0pt] \Draw (0,0) circle (1) ;

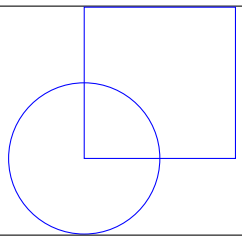
6.1.3 Avec décalage

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) ;

6.2 Dans un environnement tikzpicture

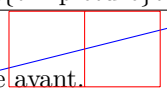
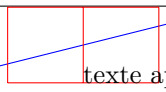
texte avant  texte après	texte avant **\begin{tikzpicture}**[blue] \draw (0,0) rectangle(2,2) ; \draw (0,0) circle (1) ; **\end{tikzpicture}** texte après

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

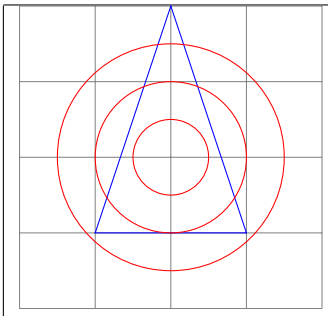
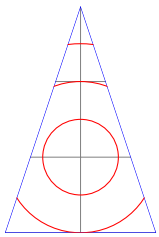
texte avant  texte après	texte avant \begin{tikzpicture}[blue,baseline=1cm] \draw (0,0) rectangle(2,2) ; \draw (0,0) circle (1) ; \end{tikzpicture} texte après

6.3 Modification du cadrage

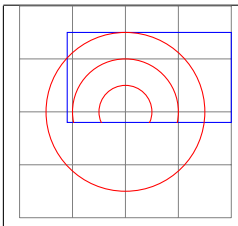
\draw [use as bounding box] (1,0) rectangle (2,1) ; \draw[blue] (-1,0) - - (3,1) ;	
texte avant texte après	texte avant texte après
(1,0) rectangle (2,1)	(0,0) rectangle (0,0)

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	texte avant.  texte après
[trim left=1cm]	[trim right= 1cm]

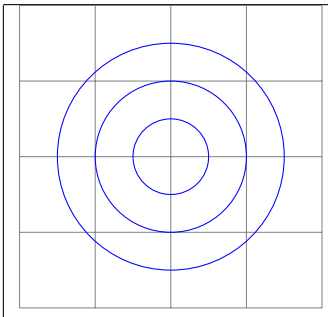
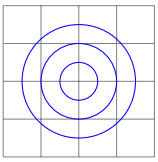
6.4 Coupure de l'image

	
sans coupure	**clip** (-1,-1) - -(0,2) - - (1,-1) - - cycle ;

6.5 Rognage partiel

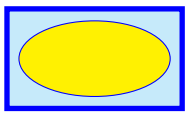
	\tikzpicture[red,scale=.7] \draw[help lines] (-2,-2) grid (2,2) ; \draw[blue] (-1.1,-0.2) rectangle (2,1.5) ; \draw (0,0) circle (1.5) ; **clip** (-1.1,-0.2) rectangle (2,1.5) ; \draw (0,0) circle (.5) ; \draw (0,0) circle (1) ; \endtikzpicture

6.5.1 Changement d'échelle

	
Taille normale	\tikzpicture[blue,scale=.5]

7 Arrière plan du dessin

7.1 Encadrement



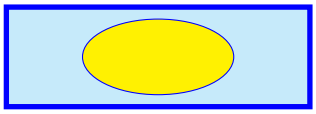
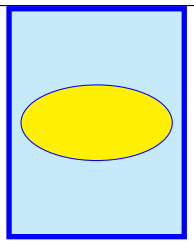
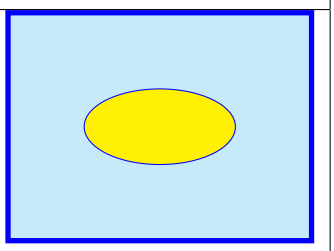
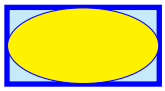
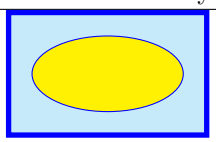
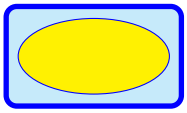
[1]

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

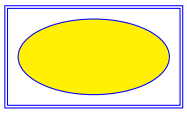
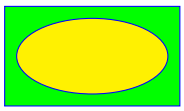
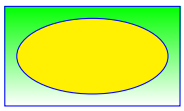
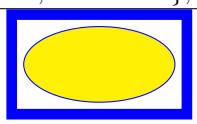
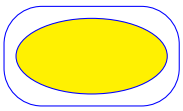
Autre syntaxe :

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

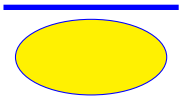
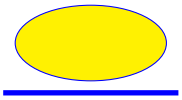
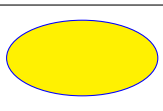
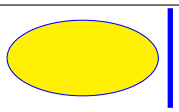
7.1.1 Options

\begin{tikzpicture}[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	Par défaut : inner frame ysep=1ex	
		
tight background	loose background	rounded corners
(inner frame sep = 0pt)	(inner frame sep = 2ex)	

7.1.2 Style

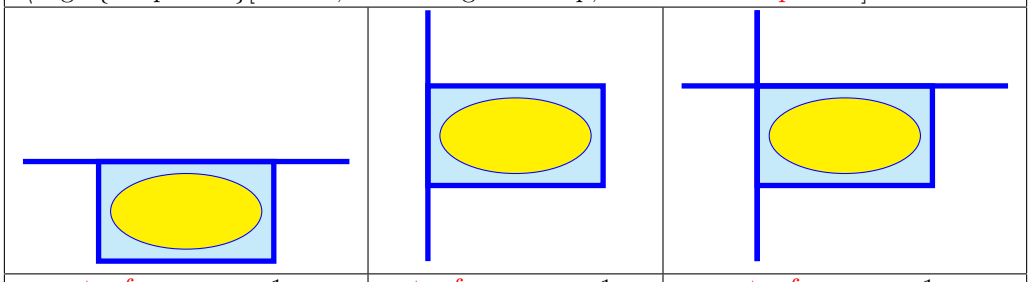
\begin{tikzpicture}[background rectangle/.style={double,draw=blue},framed]				
				
double	fill=green	top color=green	line width=4pt	rounded corners=0.5cm

7.2 Encadrement partiel

\begin{tikzpicture}[show background top]			
			
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}}

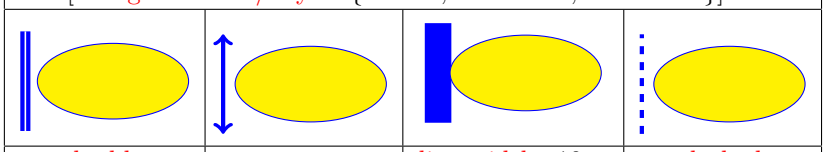
```
\begin{tikzpicture}[framed,show background top,outer frame xsep=1cm]
```



outer frame xsep=1cm	outer frame ysep=1cm	outer frame sep=1cm

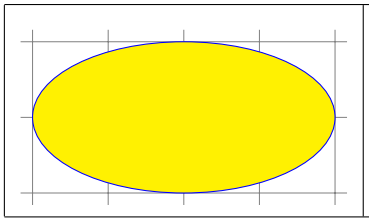
7.2.1 Style

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



double	<->	line width=10pt	dashed

7.3 Quadrillage



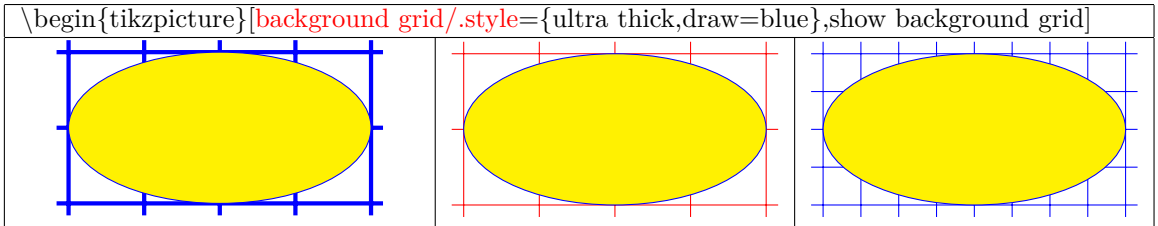
```
\begin{tikzpicture}[show background grid]
\filldraw[fill=yellow] (0,0) ellipse (2 and 1) ;
\end{tikzpicture}
```

Autre syntaxe :

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

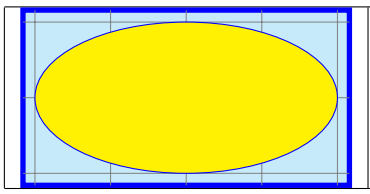
7.3.1 Style

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



ultra thick ,draw=blue,draw=blue	draw=red	step=.5cm,draw=blue

7.4 Encadrement et quadrillage



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

8 Créer ses commandes

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 ma boite 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}

contenu

Exemple : commande sans variable :

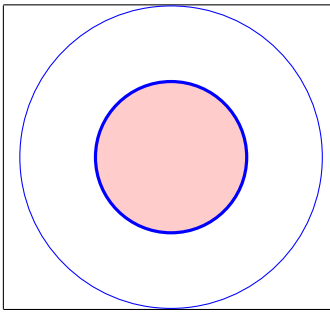
Création

\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

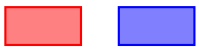
9 Créer ses styles

9.1 Style 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}
```

9.2 Style à 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}
```

10 Mettre du texte en valeur

10.1 Dans un nœud de Tikz

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

10.1.1 Options

\tikz \draw node[draw,double,blue] {texte} ;							
texte	texte	texte	texte	texte	texte	texte	texte
double	rounded corners	ultra thick	dashed	red	rotate=45	shading=radial	text=red

\tikz \draw node[draw,inner sep=0pt] {texte} ;			
texte	texte	texte	texte
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} ; \fill (node cs :name=A,anchor=east) circle (3pt) ; \fill (node cs :name=A,anchor=south) circle (3pt) ;			
texte	texte	texte	texte
outer sep=1cm	outer sep=0pt	outer xsep=1cm	outer ysep=1cm
Par défaut : 0.5\pgflinewidth			

10.1.2 Taille minimale des noeuds

\draw((0,0) node[fill=blue !20,minimum height=1.5cm,draw] {texte} ;			
texte	texte	texte	texte
minimum height=1.5cm	minimum width=3cm	minimum size=1.5cm,draw	minimum size=1.5cm,circle

10.2 Dans un nœud à formes géométriques

Insérer dans le préambule :

```
\usetikzlibrary{shapes.geometric}
```

10.2.1 Formes disponibles

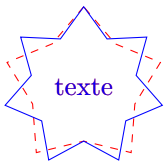
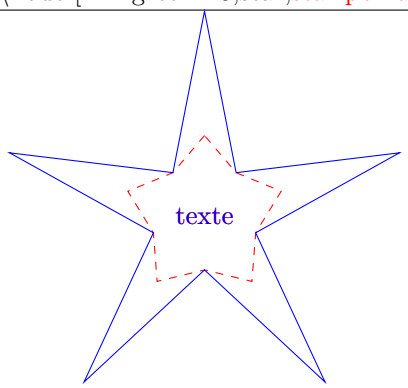
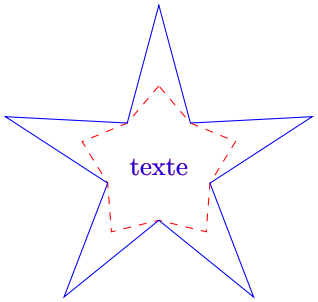
2 syntaxes :
\tikz \node[fill=green !20,shape=diamond,draw,blue] {texte} ;
\tikz \node[fill=green !20,diamond,draw] {texte} ;

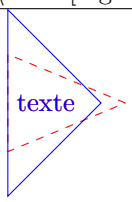
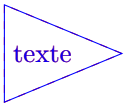
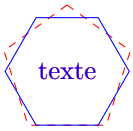
texte	texte	texte	texte
diamond	ellipse	trapezium	semicircle
texte	texte	texte	texte
star	regular polygon	isosceles triangle	kite
texte	texte	texte	
dart	circular sector	cylinder	

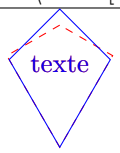
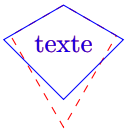
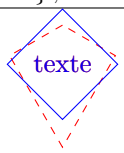
10.2.2 Options

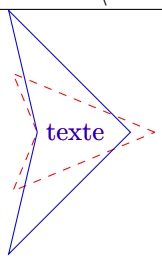
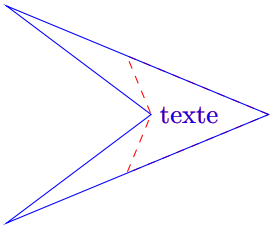
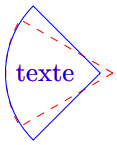
\node [trapezium,draw,trapezium left angle=90,draw,blue] {texte} ;

texte	texte	texte
trapezium left angle=90	trapezium right angle=90	trapezium angle=120
texte	texte	texte
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 défaut1.5

\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} ;	
texte	texte
aspect=2	aspect=4
texte	texte
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} ;			
texte	texte	texte	texte
shape aspect=1	shape aspect=2	shape aspect=3	shape aspect=4

10.3 Dans un nœud en forme de symboles

\usetikzlibrary{shapes.symbols}

10.3.1 Formes disponibles

texte	texte	texte
forbidden sign	magnifying glass	cloud
texte	texte	texte
starburst	signal	tape

10.3.2 Options

\node[magnifying glass,magnifying glass handle angle=45,draw,blue] {texte} ;		
texte	texte	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} ;			
texte	texte	texte	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} ;			
texte	texte	texte	texte
starburst points=5	starburst point height=1cm	random starburst=50	random starburst=0

\node [signal,signal pointer angle=45,draw,blue] {texte} ;		
texte	texte	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} ;			
texte	texte	texte	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} ;			
texte	texte	texte	texte
signal from=above	signal from=below	signal from=right	signal from=above

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

\tikz \node [tape, draw,tape bend top=out and in] {texte} ;		
texte	texte	texte
tape bend top=out and in	tape bend bottom=out and in	tape bend bottom=in and in
texte	texte	texte
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} ;
texte
Par défaut : tape bend height = 5pt

10.4 Dans un nœud en forme de flèche

\usetikzlibrary{shapes.arrows}

10.4.1 Formes disponibles

texte	texte	texte
single arrow	double arrow	arrow box

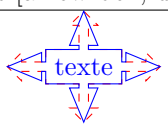
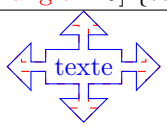
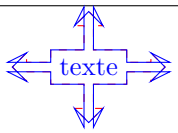
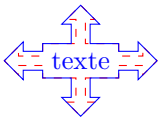
10.4.2 Options

\node[single arrow,draw,single arrow tip angle=45] {texte} ; \node[single arrow,draw,single arrow head extend=.75cm] {texte} ;				
texte	texte	texte	texte	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} ;			
texte	texte	texte	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} ;				
texte	texte	texte	texte	texte
angle=45	angle=120	extend=1ex	extend=0	indent=1ex

\node [arrow box, draw, arrow box arrows={north :.25cm}] {texte} ;			
texte	texte	texte	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

10.5 Dans un nœud en forme de bulle

insérer dans le préambule :

```
\usetikzlibrary{shapes.callouts}
```

10.5.1 Formes disponibles

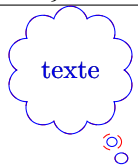
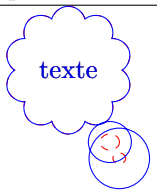
texte	texte	texte
ellipse callout	rectangle callout	cloud callout

10.5.2 Options

\node [rectangle callout,draw,callout absolute pointer=(0,1)] at (2,1) {texte} ;			
texte	texte	texte	texte
callout relative pointer={(0,1)}		callout absolute pointer={(0,1)}	
texte	texte	texte	texte
callout pointer shorten=.5cm			

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

10.6 Dans un nœud en diverses formes diverses

insérer dans le préambule :

```
\usetikzlibrary{shapes.misc}
```

10.6.1 formes disponibles

texte	texte	texte	texte
cross out	strike out	rounded rectangle	chamfered rectangle

10.6.2 Options

Options pour « rounded rectangle » :

\node [draw, rounded rectangle,rounded rectangle arc length=270] {texte} ;				
texte	texte	texte	texte	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} ;			
texte	texte	texte	texte
concave	convex	none	

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

Options pour « chamfered rectangle » :

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

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

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

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

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

10.7 Nœuds à plusieurs parties

insérer dans le préambule :

```
\usetikzlibrary{shapes.multipart}
```

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

haut / bas	haut / bas	texte haut / texte bas	haut
circle split	circle solidus	ellipse split	rectangle split

texte 1
texte 2
texte 3

```
\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} ;
```

texte 1 | texte 2 | texte 3

texte 1
texte 2a
texte 2b
texte 2c
texte 3a
texte 3b

```
\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} ;
```

texte 1 texte 2 texte 3 texte 4	texte 1 texte 2 texte 3 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} ;
```

texte 1 texte 3	texte 1 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} ;	
texte 1 texte 3	texte 1 texte 3
rectangle split empty part depth=1cm	text depth=1cm
Par défaut : 0ex	Par défaut : 0ex
texte 1 texte 3	texte 1 texte 3
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

texte 1 texte 2 texte 3 texte 4	\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} ;
texte 1 texte 2 texte 3 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}]{} ;

10.8 Mise en forme du texte

10.8.1 Position du texte

\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

10.8.2 Couleur et fontes

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

10.8.3 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

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

10.9 Positions prédéfinies sur un nœud

10.9.1 pour l'ensemble des nœuds

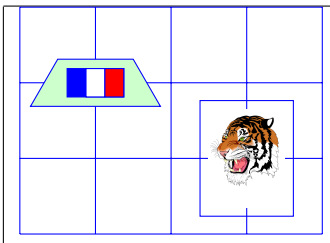
texte	texte	texte	texte
north west	north	north east	text
texte	texte	texte	texte
west	mid west	base west	base
texte	texte	texte	texte
east	mid esat	base east	mid
texte	texte	texte	texte
south east	south	south west	center
texte	texte	texte	
0	120	-60	

10.9.2 spécifique à un nœud

Dans une prochaine version !

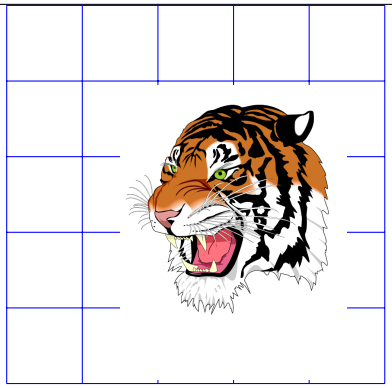
11 Insertion images dans un environnement Tikz

11.0.3 Dans un noeud



```
\begin{tikzpicture}
\draw (0,0) grid (5,3) ;
\node [fill=green !20,trapezium,draw] at (1,2) {\DFR } ; 28
\node [draw] at (3,1) {\includegraphics[width=1cm]{tiger} } ;
\end{tikzpicture}
```

11.0.4 En déclarant l'image dans pgf

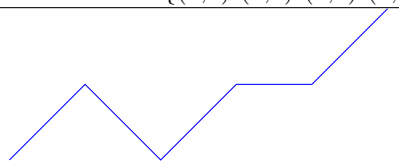


```
\pgfdeclareimage[width=3cm]{ttt}{tiger}

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

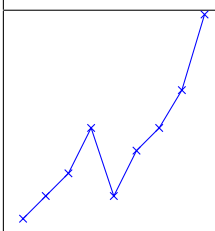
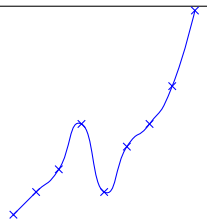
12 Créer un graphe

12.1 Graphe avec Tikz

12.1.1 Graphe à partir d'une liste de points

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


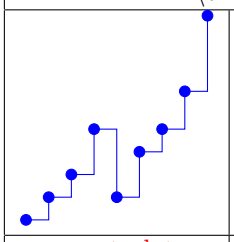
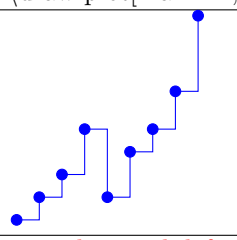
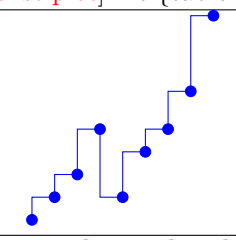
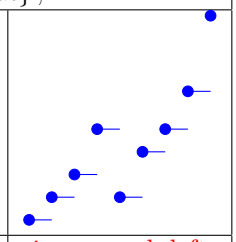
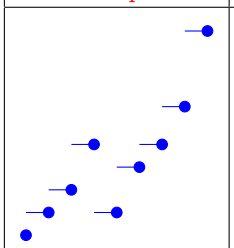
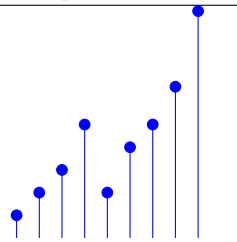
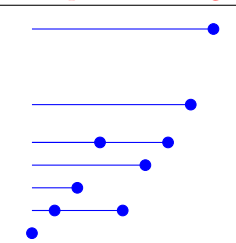
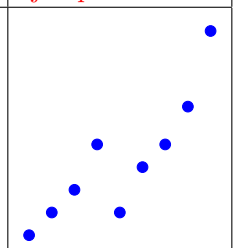
12.1.2 Graphe à partir partir d'un fichier de données

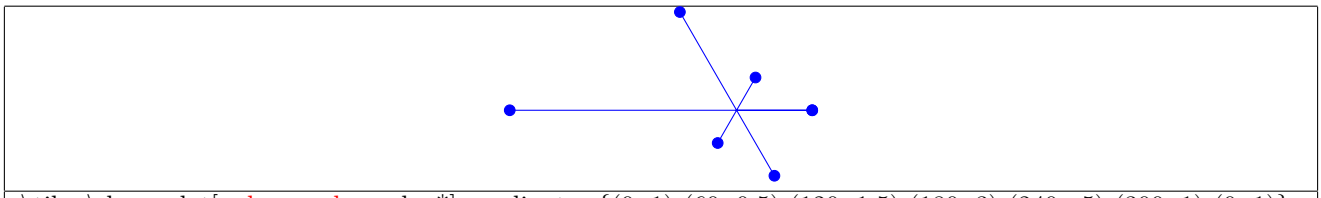
\tikz \draw plot[mark=x] file {table.dat} ;			
			
[mark=x]	[mark=x,smooth]	[mark=x,smooth,tension=.2]	[mark=x,smooth,tension=1]
Par défaut : tension= 0 :55			

Contenu du fichier table.dat :

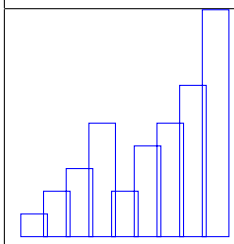
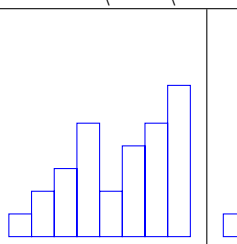
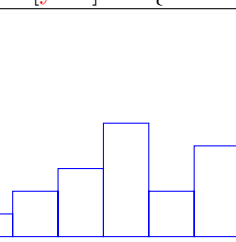
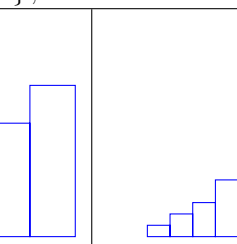
0.0	0.3
0.3	0.6
0.6	0.9
0.9	1.5
1.2	0.6
1.5	1.2
1.8	1.5
2.1	2.0
2.4	3.0

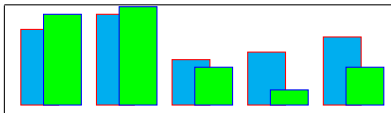
12.1.3 Les types de graphes

\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

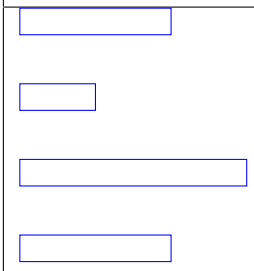
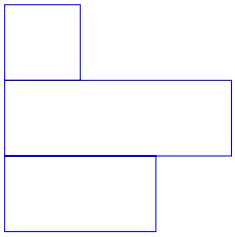
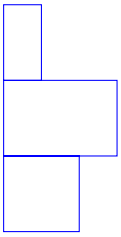
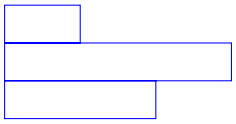


\tikz \draw plot[polar comb,mark=*]coordinates {(0 :1) (60 :0.5) (120 :1.5) (180 :3) (240 :.5) (300 :1) (0 :1)} ;

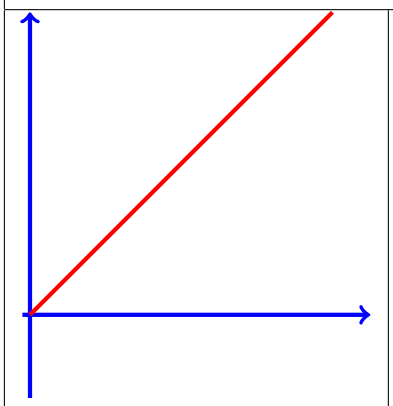
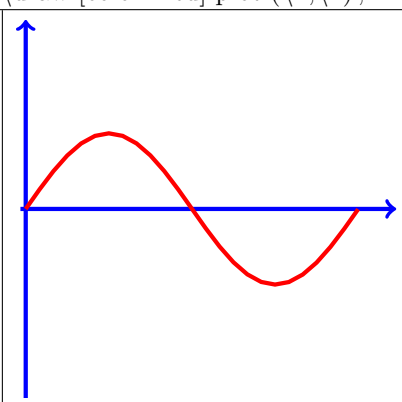
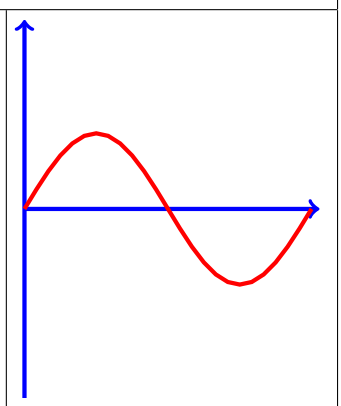
\tikz \draw plot[ybar] file {table.dat} ;			
			
[ybar]	[ybar interval]	[ybar interval,x=2cm]	[ybar interval,y=.5cm]



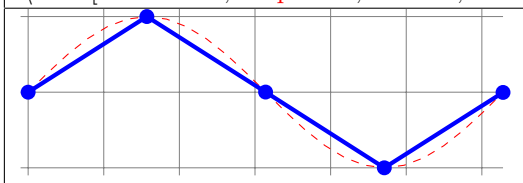
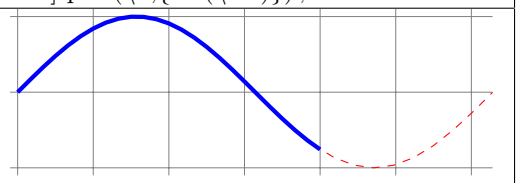
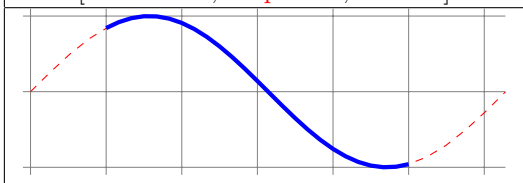
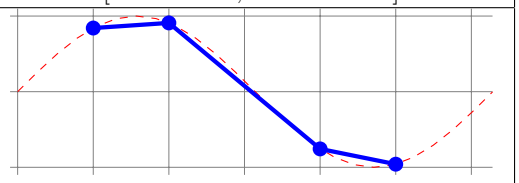
```
\begin{tikzpicture}
\draw[red,fill=cyan,ybar,bar width=.5cm]
        plot coordinates {(0,1) (1,1.2) (2,.6) (3,.7) (4,.9)} ;
\draw[blue,fill=green,ybar,bar width=.5cm,bar shift=.3cm]
        plot coordinates {(0,1.2) (1,1.3) (2,.5) (3,.2) (4,.5)} ;
\end{tikzpicture}
```

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

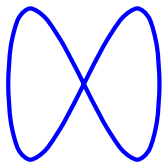
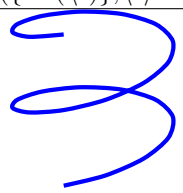
12.1.4 Graphe à partir d'une fonction

\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=*]

12.1.5 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)})

12.2 Marques

12.2.1 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=+

12.2.2 Marques personnalisées avec text mark

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

A A A	Texte Texte Texte		
text mark=A	text mark=Texte	text mark=\DFR 28	text mark={\includegraphics[width=.5cm]{tiger}}

12.2.3 Marques avec l'extension plotmarks

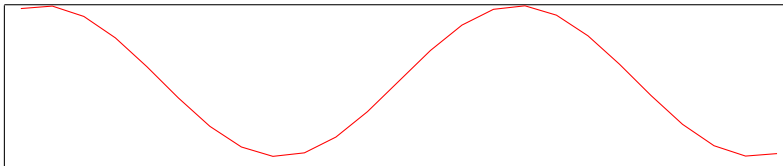
Insérer dans le préambule :

```
\usetikzlibrary{plotmarks}
```

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*

12.3 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 »
Pour les tracés suivant, le fichier « sin.table »sera utilisé

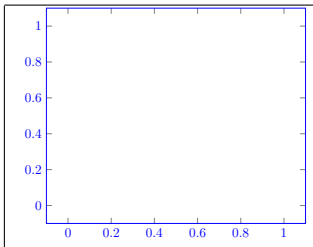
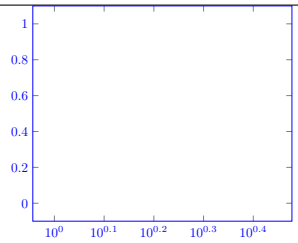
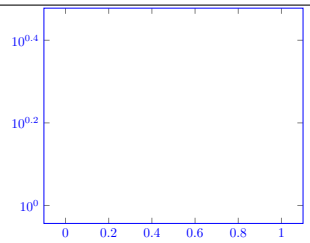
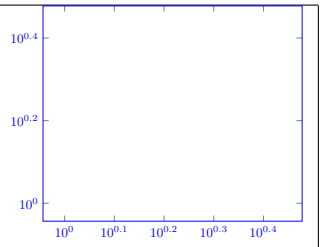
13 Créer un graphe avec pgfplot [2]

Insérer dans le préambule

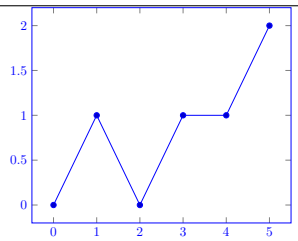
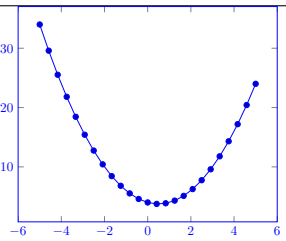
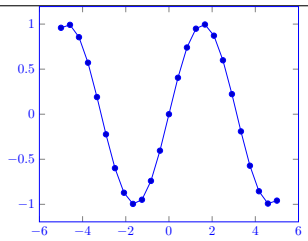
```
\usepackage{pgfplots}
```

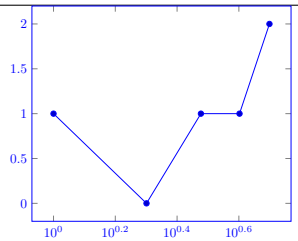
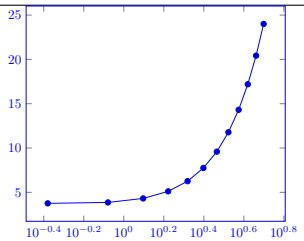
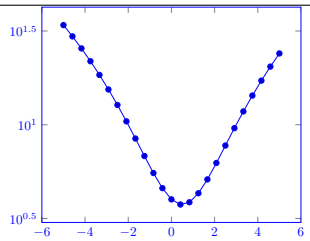
13.1 Courbes 2 D

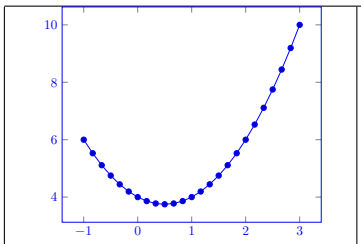
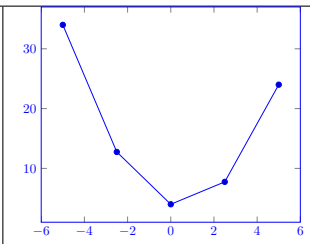
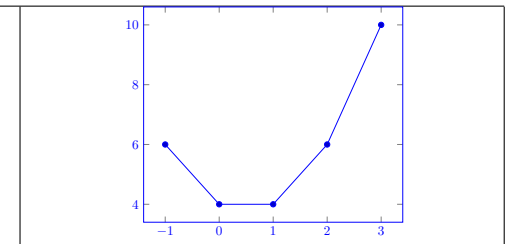
13.1.1 Axes

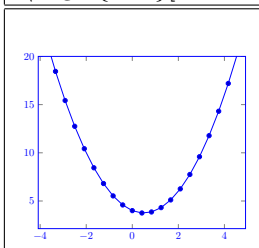
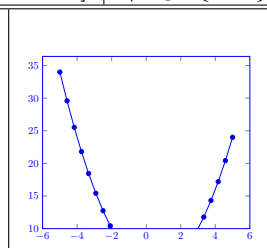
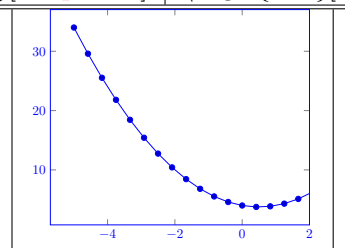
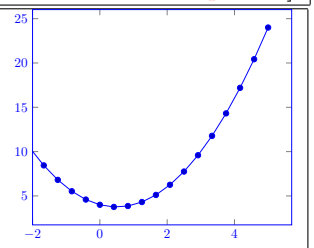
			
\begin{axis} \end{axis}	**\begin{semilogxaxis}** \end{semilogxaxis}	**\begin{semilogyaxis}** \end{semilogyaxis}	**\begin{loglogaxis}** \end{loglogaxis}

13.1.2 Tracé de la courbe

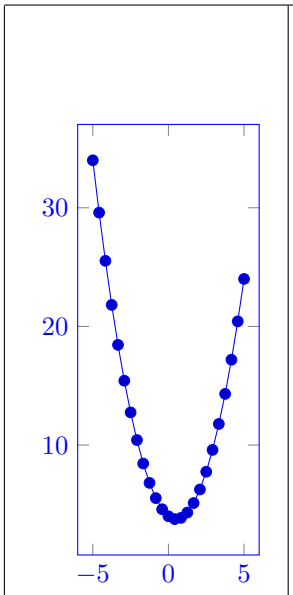
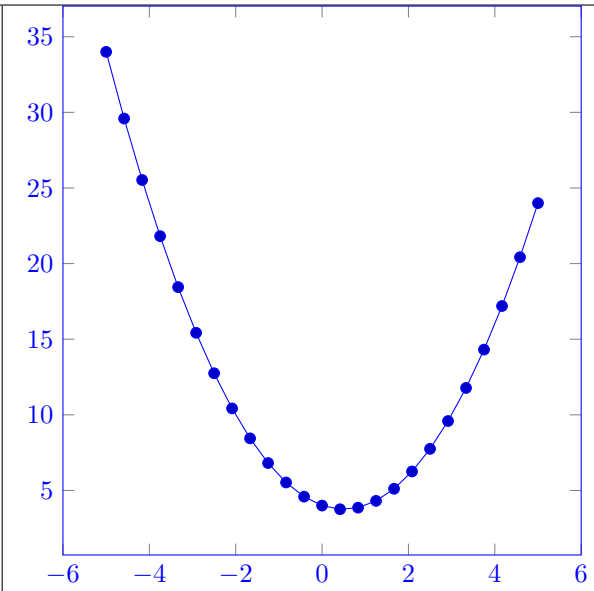
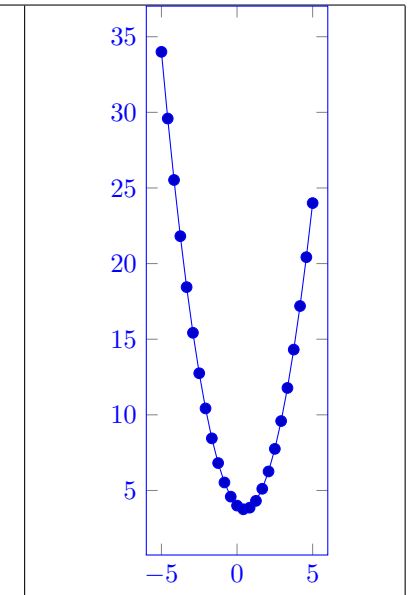
		
\addplot coordinates {(0,0) (1,1) (2,0) (3,1) (4,1) (5,2)} ;	**\addplot** {x^2 - x +4} ;	**\addplot** gnuplot[id=sin]{sin(x)} ;

		
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} ;

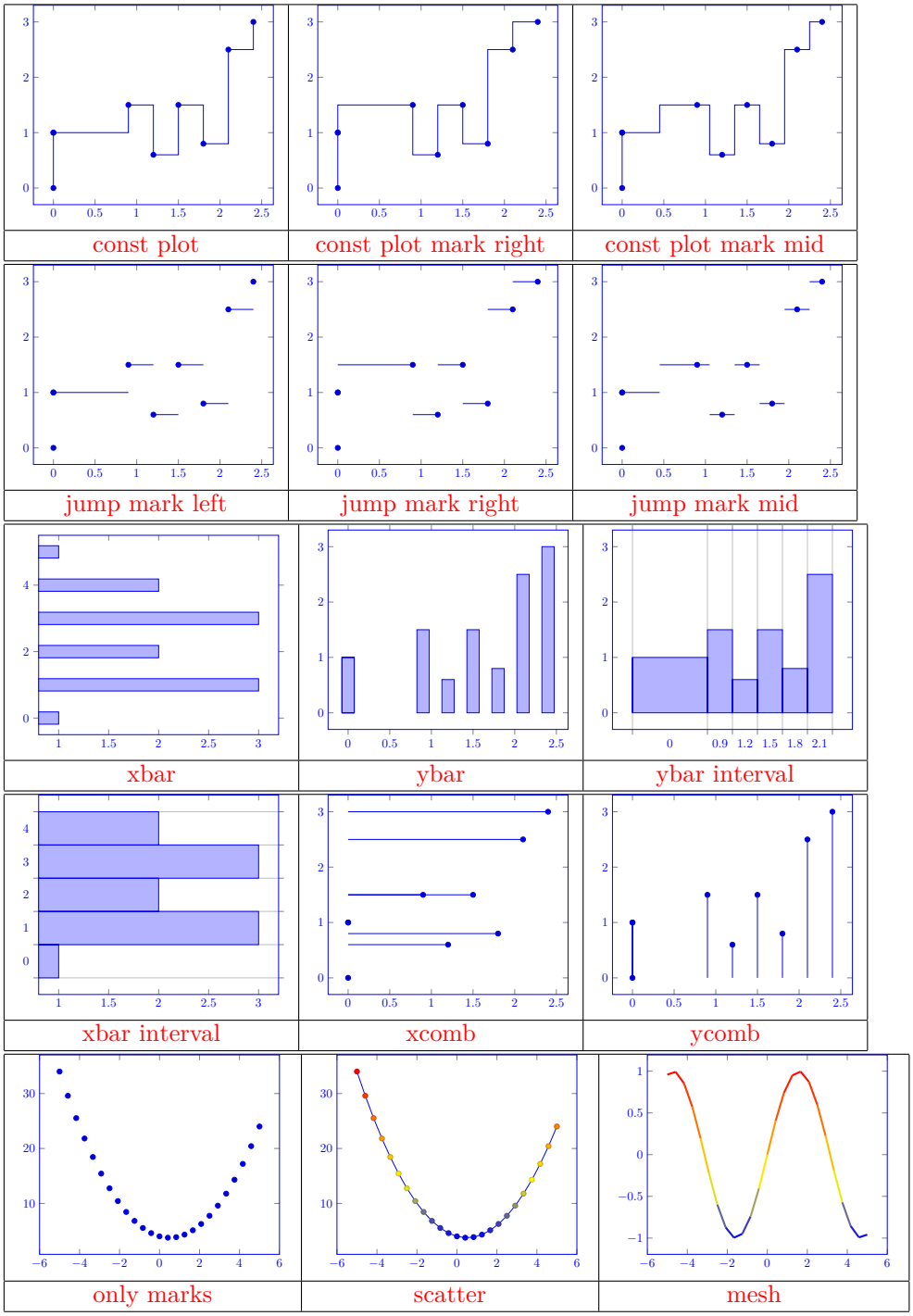
		
\begin{axis}[domain=-1 :3]	\begin{axis}[samples=5]	\begin{axis}[domain=-1 :3,samples=5]

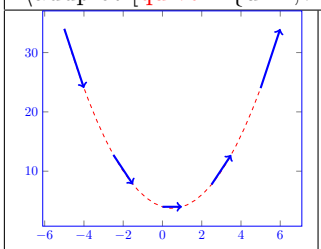
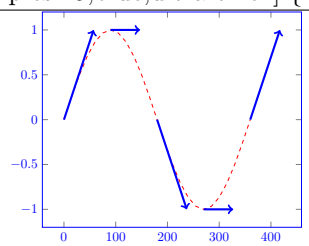
			
ymax=20	ymin=10	xmax=2	xmin=-2

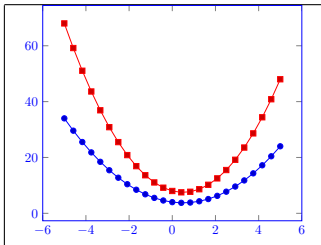
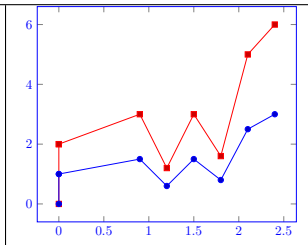
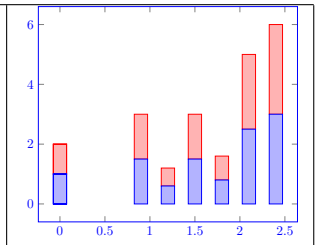
13.1.3 Dimension unitaire en X et Y

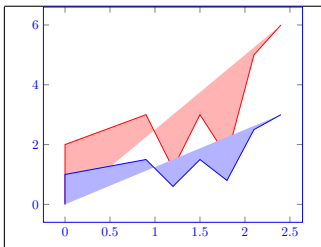
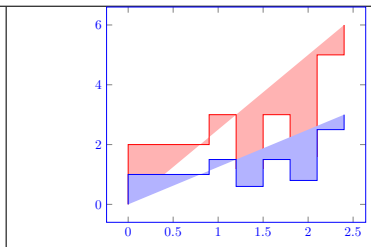
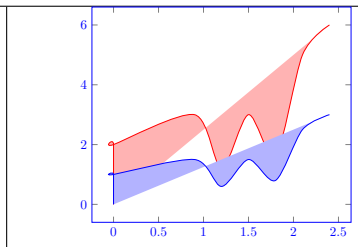
		
\begin{axis}[x=.2cm]	\begin{axis}[y=.2cm]	\begin{axis}[x=.2cm,y=.2cm]

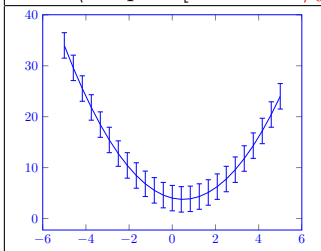
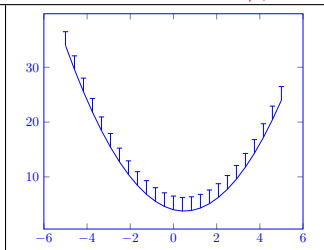
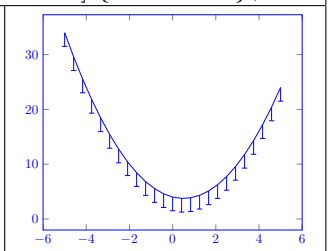
13.1.4 Type de graphiques

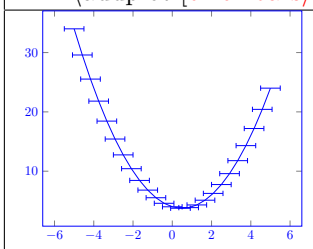
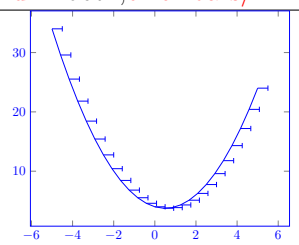
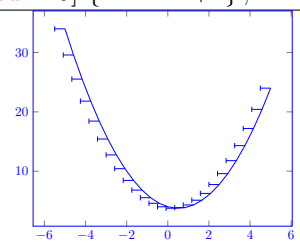


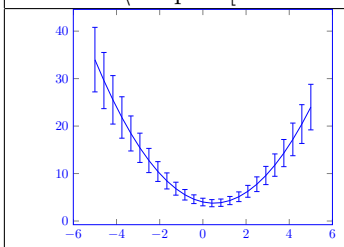
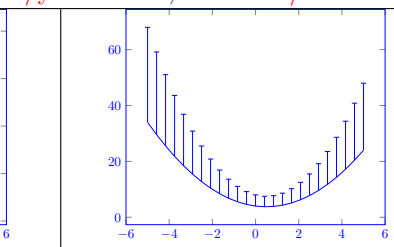
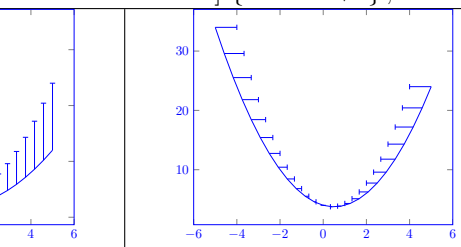
\addplot [quiver={u=1,v=2*x}],->,samples=5,blue,ultra thick] {x^2 - x +4} ;	
	
quiver=u=1,v=2*x	quiver={u=180/3.14,v=cos(x)}
Par défaut : u=0 et v = 0	

		
[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]

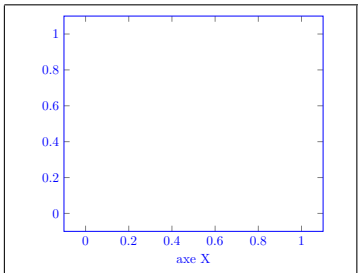
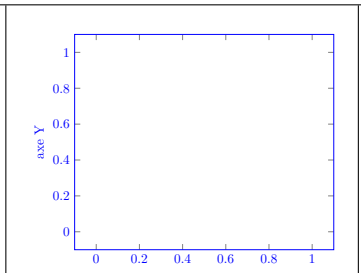
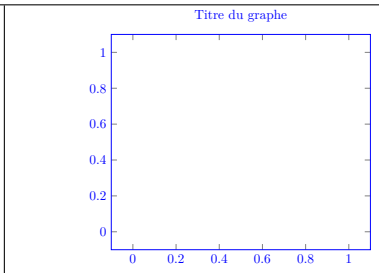
\addplot [error bars/y dir=both,error bars/y fixed =2.5] {x^2 - x +4} ;		
		
error bars/y dir =both	error bars/y dir =plus	error bars/y dir =minus

\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

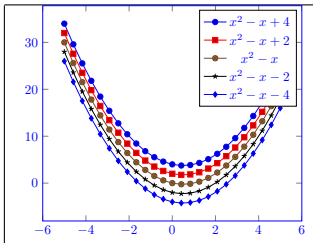
\addplot [error bars/y dir=both,error bars/x fixed relative =.2] {x^2 - x +4} ;		
		
error bars/y fixed relative =.2	error bars/y fixed relative =1	error bars/x fixed relative =.2

13.2 Habillage du graphe

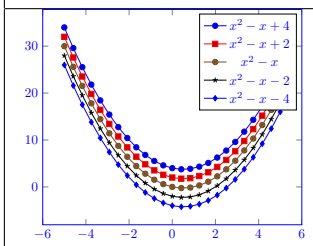
13.2.1 Titres

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

13.2.2 Légende

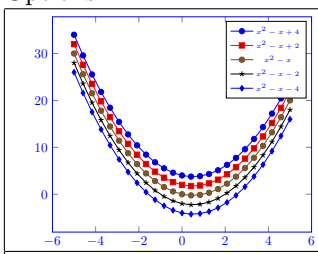



```
\begin{axis}
\addplot {x^2 - x +4};
\addplot {x^2 - x +2};
\addplot {x^2 - x };
\addplot {x^2 - x -2 };
\addplot {x^2 - x -4 };

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

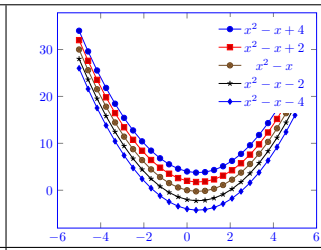



```
\begin{axis}[legend entries= {$ x^2 - x +4 $,$ x^2 - x +2 $,$ x^2 - x $,$ x^2 - x -2 $,$ x^2 - x -4 $} ]

\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}
```

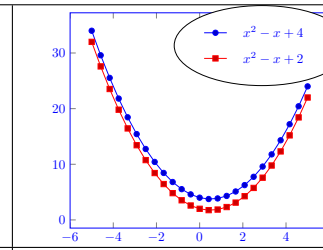
Options



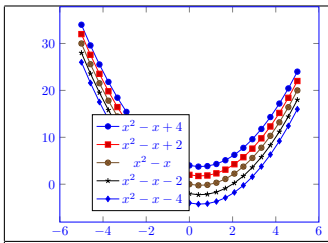
legend style={font=\tiny}



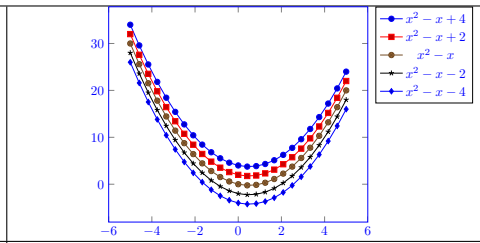
legend style={draw=none}



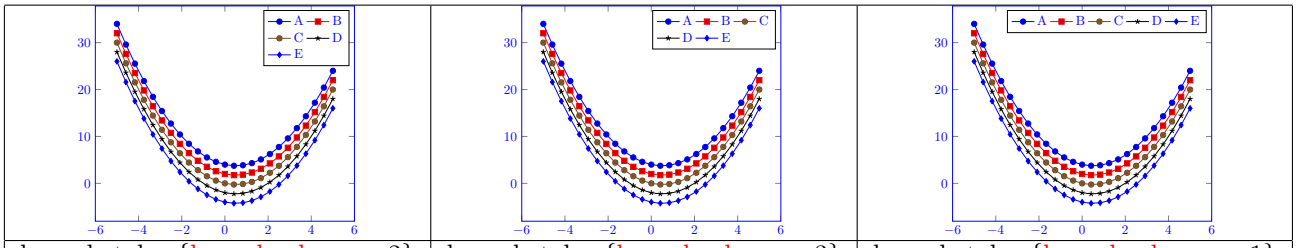
legend style={shape=ellipse}



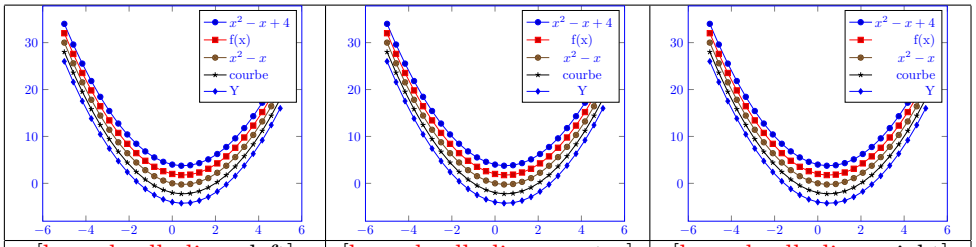
legend style={at={(.5,.5)}}



legend style={legend pos=outer north east}

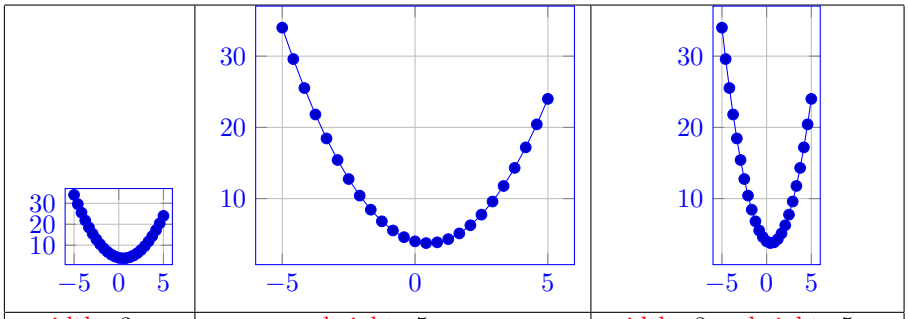


legend style={legend columns=2}	legend style={legend columns=3}	legend style={legend columns=-1}



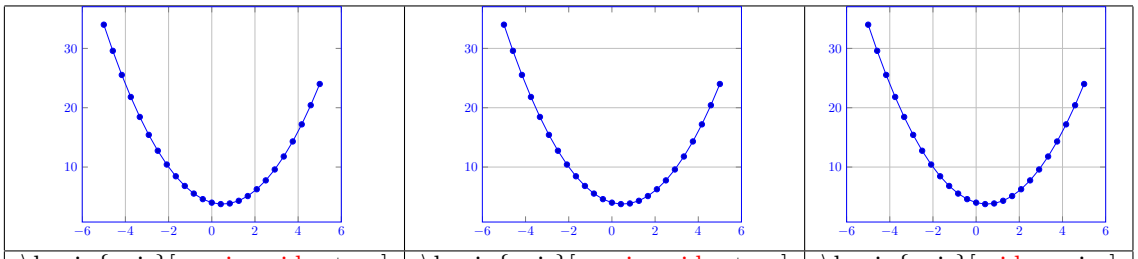
[legend cell align=left]	[legend cell align=center]	[legend cell align=right]

13.2.3 Taille du graphe

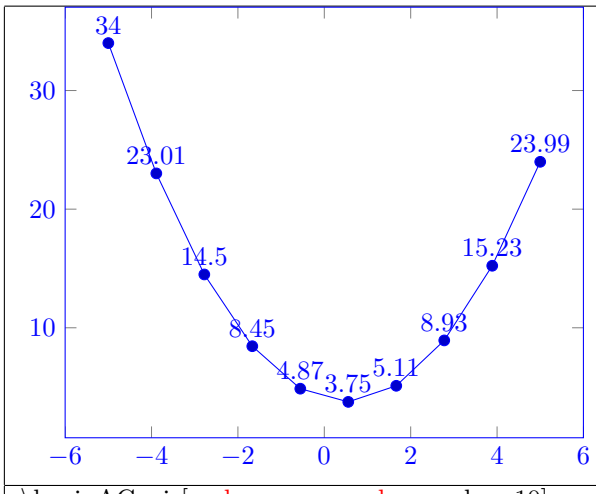


width=3cm	height=5cm	width=3cm,height=5cm

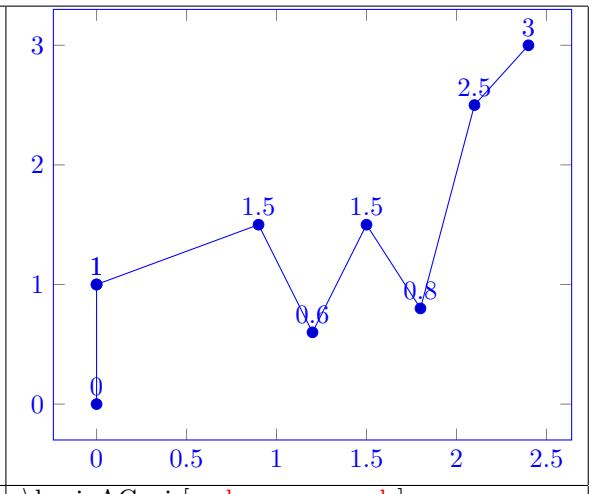
13.2.4 Quadrillage



\begin{axis}[xmajorgrids=true]	\begin{axis}[ymajorgrids=true]	\begin{axis}[grid=major]



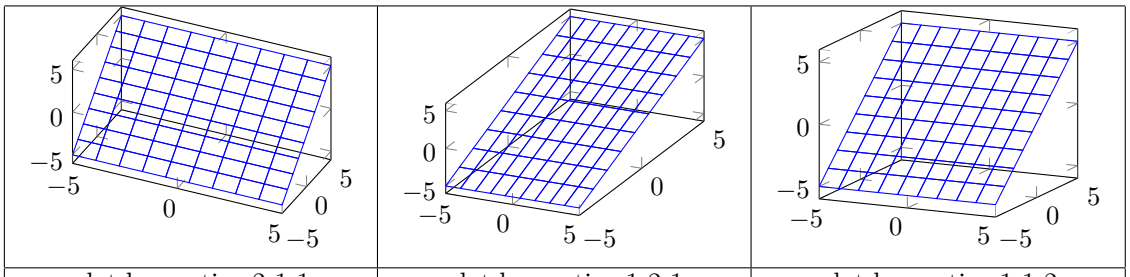
\beginACaxis[nodes near coords,samples=10]
\addplot {x^ 2- x +4};



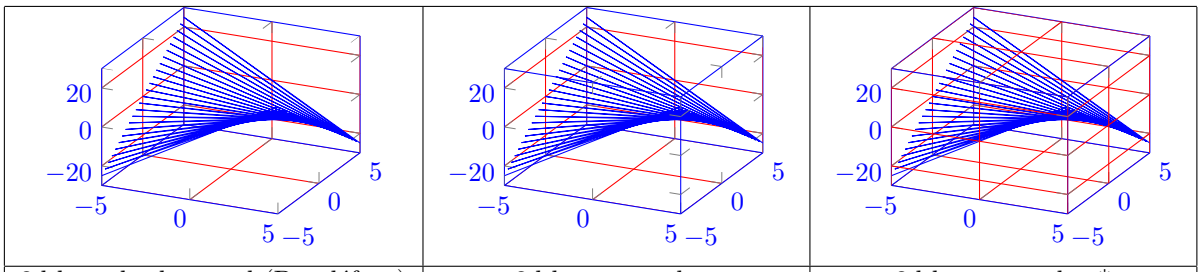
\beginACaxis[nodes near coords]
\addplot file table2.dat;

13.3 Courbes 3D

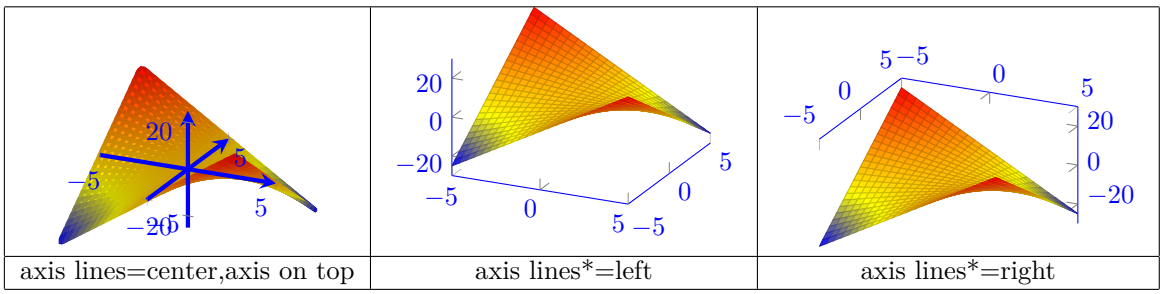
13.3.1 Axes



plot box ratio=2 1 1	plot box ratio=1 2 1	plot box ratio=1 1 2

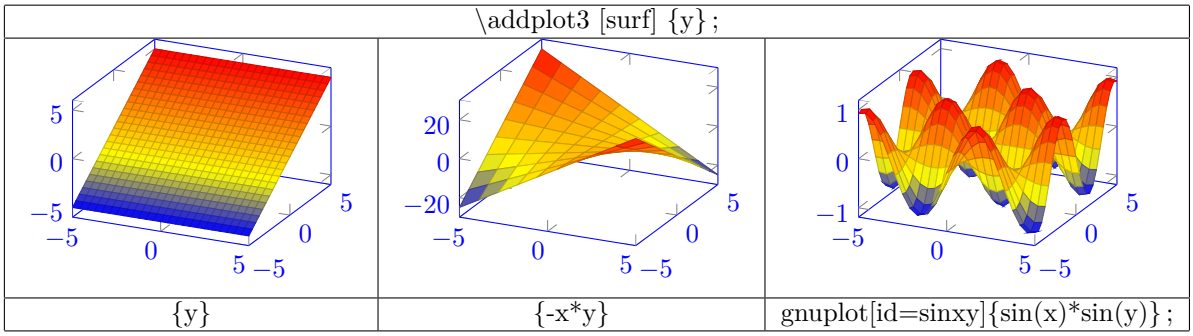


3d box=background (Par défaut)	3d box=complete	3d box=complete*

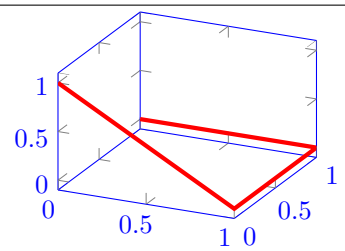
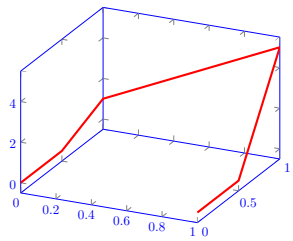
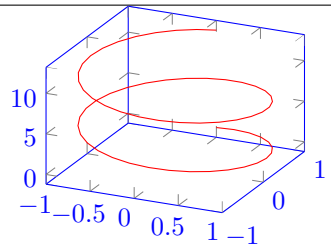


axis lines=center,axis on top	axis lines*=left	axis lines*=right

13.3.2 Tracé de la courbe



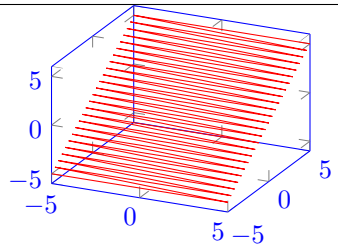
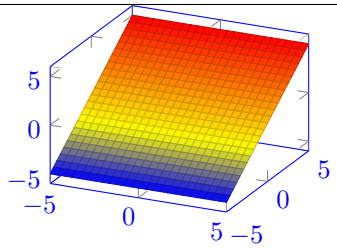
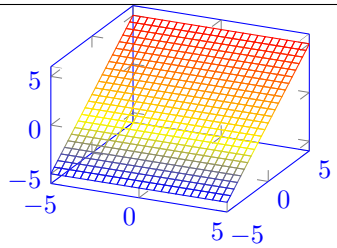
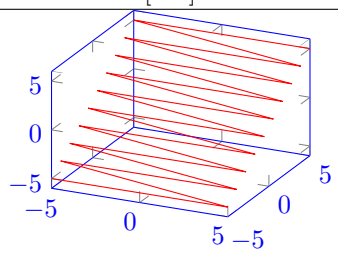
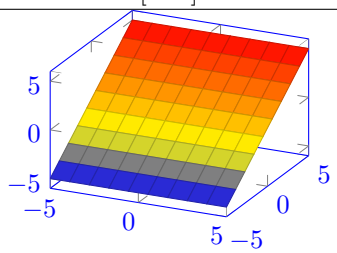
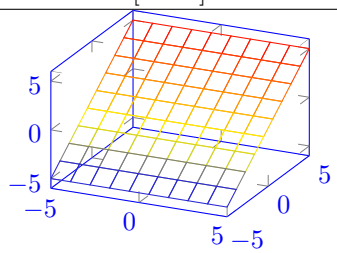
\addplot3 [surf] {y} ;		
{y}	{-x*y}	gnuplot[id=sinxy]{sin(x)*sin(y)} ;

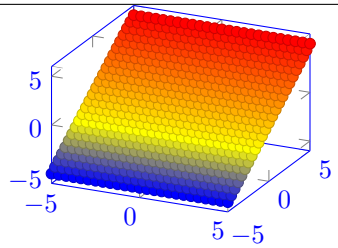
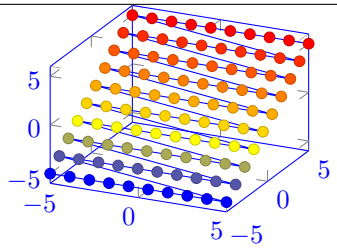
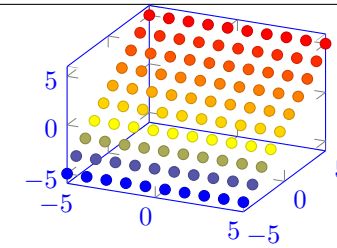
		
coordinates {(0,0,1) (1,0,0) (1,1,0) (0,1,0)} ;	file {table3.dat} ;	{sin(x)},{cos(x)},{x/60}) ;

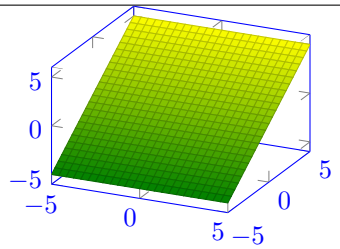
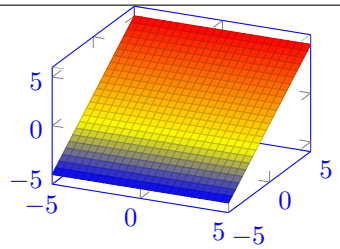
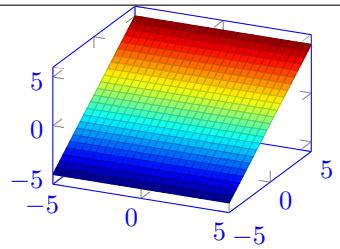
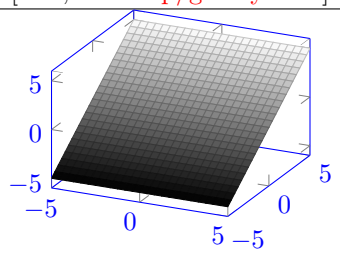
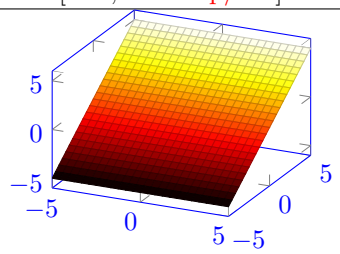
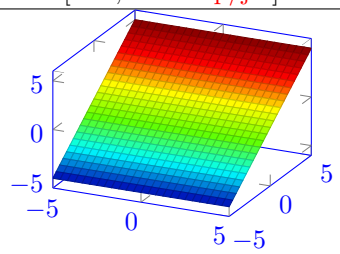
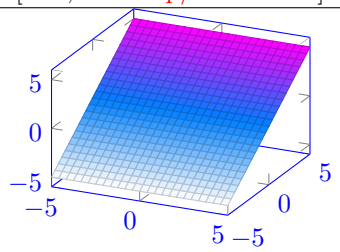
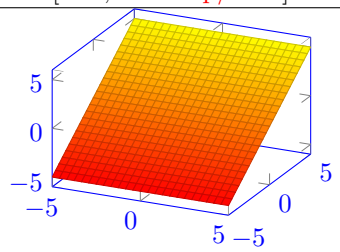
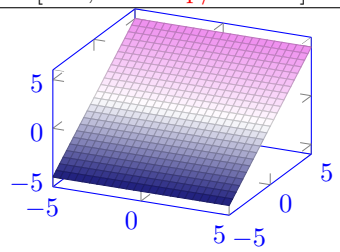
Contenu du fichier table3.dat :

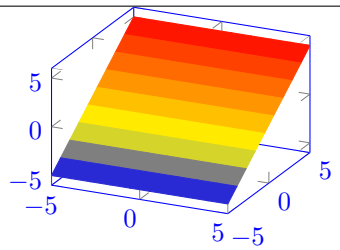
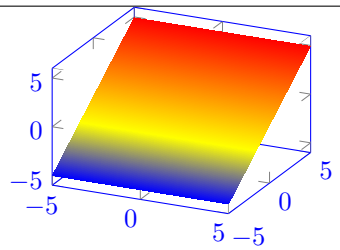
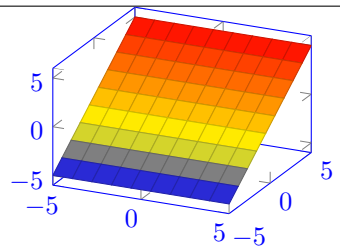
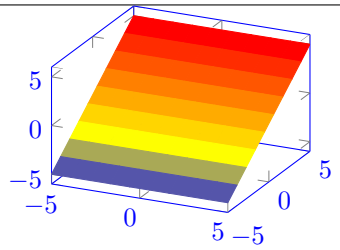
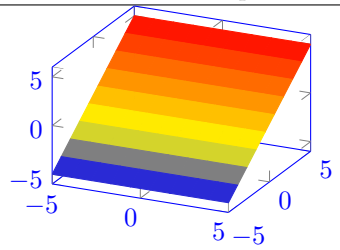
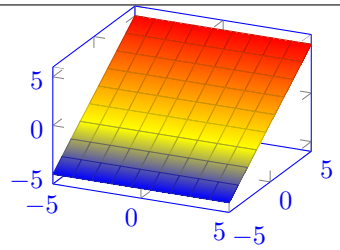
0	0	0
0	.5	0
0	1	1
1	1	5
1	.5	0
1	0	0

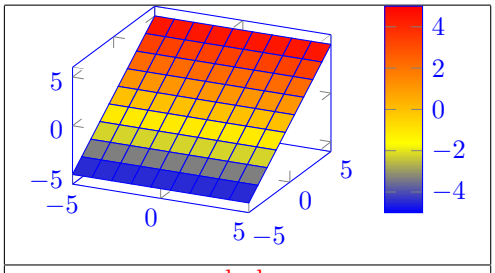
13.3.3 Aspect

		
[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

13.3.4 Point de vue

Azimut	Elévation
view/az= angle de - 50 à +50	view/el= angle de - 50 à +50

14 Les Tableaux de variation

Insérer la commande \usepackage{tkz-tab} dans le préambule

14.1 Déclaration du tableau

1° ligne	a	b	c
2° ligne			

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

14.1.1 Options

Hauteur des lignes :

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

14.2 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 :

x	$-\infty$		-4		4		10		$+\infty$
$f(x)$		+				−	0	+	

```
\begin{tikzpicture}
\tkzTabInit[espcl=1.5]{$x$ / 1 ,$f(x)$ /1 } { −∞ , -4, 4 , 10 , +∞ }
\tkzTabLine{ t,+, d ,h ,d,-,z,+ }
\end{tikzpicture}
```

14.3 Création d'une ligne de variations

x	a		b		c
$f(x)$	1	↘	2		

\tkzTabVar{ +/1 , -/2}

x	a		b		c
$f(x)$			2	↗	1

\tkzTabVar{ -/1 , +/2}

x	a		b		c
$f(x)$	1	→	2		

\tkzTabVar{-/1 , -/2}

x	a		b		c
$f(x)$	1	→	2		

\tkzTabVar{ +/1 , +/2 }

x	a		b		c
$f(x)$	‖ 1 ‖	↘	2		

\tkzTabVar{ +C/1 , -/2}

x	a		b		c
$f(x)$	‖		2	↗	1 ‖

\tkzTabVar{ -C/1 , +/2}

x	a		b		c
$f(x)$	1	↘	‖ 2 ‖		

\tkzTabVar{-/1 , -C/2}

x	a		b		c
$f(x)$			‖ 2 ‖	↗	1

\tkzTabVar{ +/1 , +C/2 }

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ +H/1 , -/2}

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ -H/1 , +/2}

x	a	b	c
$f(x)$	1 ↘	2	

\tkzTabVar{-/1 , -H/2}

x	a	b	c
$f(x)$	1 ↗	2	

\tkzTabVar{ +/1 , +H/2 }

x	a	b	c
$f(x)$	1 ‖ →	2	

\tkzTabVar{ +D/1 , -/2}

x	a	b	c
$f(x)$	1 ‖ ↗	2	

\tkzTabVar{ -D/1 , +/2}

x	a	b	c
$f(x)$	1 ↘	2 ‖	

\tkzTabVar{-/1 , -D/2}

x	a	b	c
$f(x)$	1 ↗	2 ‖	

\tkzTabVar{ +/1 , +D/2 }

x	a	b	c
$f(x)$	‖ 1 ↘	2	

\tkzTabVar{ D+/1 , -/2}

x	a	b	c
$f(x)$	‖ 1 ↗	2	

\tkzTabVar{D-/1 , +/2}

x	a	b	c
$f(x)$	1 →	‖ 2	

\tkzTabVar{-/1 , D-/2}

x	a	b	c
$f(x)$	1 ↗	‖ 2	

\tkzTabVar{ +/1 , D+/2 }

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ +DH/1 , -/2}

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ -DH/1 , +/2}

x	a	b	c
$f(x)$	1 ↘	2	

\tkzTabVar{-/1 , -DH/2}

x	a	b	c
$f(x)$	1 ↗	2	

\tkzTabVar{ +DH/1 , +/2 }

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ +CH/1 , -/2}

x	a	b	c
$f(x)$	1	2	

\tkzTabVar{ -CH/1 , +/2}

x	a	b	c
$f(x)$	1 ↘	2	

\tkzTabVar{-/1 , -CH/2}

x	a	b	c
$f(x)$	1 ↗	2	

\tkzTabVar{ +/1 , +CH/2 }

x	a	b	c
$f(x)$	1 ↗ 2	2 ↗ 3	

\tkzTabVar{ -/1 , +D-/2 , +/3}

x	a	b	c
$f(x)$	1 ↘ 2	2 ↘ 3	

\tkzTabVar{ +/1 , -D+/2 , -/3}

x	a	b	c
$f(x)$	1 ↘ 2	2 ↗ 3	

\tkzTabVar{+/1 , -D-/2 , +/3}

x	a	b	c
$f(x)$	1 ↗ 2	2 ↘ 3	

\tkzTabVar{-/1 , +D+/2 , -/3 }

x	a	b	c
$f(x)$	1 ↗	2 ‖ 2	↗ 3

tkzTabVar{ -/1 , +CD-/2 , +/3}

x	a	b	c
$f(x)$	1 ↘	‖ 2 2	↘ 3

tkzTabVar{ +/1 , -CD+/2 , -/3}

x	a	b	c
$f(x)$	1 ↘	‖ 2 2	↗ 3

tkzTabVar{+/1 , -CD-/2 , +/3}

x	a	b	c
$f(x)$	1		→ 3

tkzTabVar{-/1 , +CD+/2 , -/3 }

x	a	b	c
$f(x)$	1 ↗	2 ‖ 2	↗ 3

tkzTabVar{ -/1 , +DC-/2 , +/3}

x	a	b	c
$f(x)$	1 ↘	2 ‖ 2	↘ 3

tkzTabVar{ +/1 , -DC+/2 , -/3}

x	a	b	c
$f(x)$	1 ↘	‖ 2 2	↗ 3

tkzTabVar{+/1 , -DC-/2 , +/3}

x	a	b	c
$f(x)$	1 ↗	2 2 ‖	↘ 3

tkzTabVar{-/1 , +DC+/2 , -/3 }

x	a	b	c
$f(x)$	1 ↗	2 2	↗ 3

tkzTabVar{ -/1 , +V-/2 , +/3}

x	a	b	c
$f(x)$	1 ↘	2 2	↘ 3

tkzTabVar{ +/1 , -V+/2 , -/3}

x	a	b	c
$f(x)$	1 ↘	2 2	↗ 3

tkzTabVar{+/1 , -V-/2 , +/3}

x	a	b	c
$f(x)$	1 ↗	2 2	↘ 3

tkzTabVar{-/1 , +V+/2 , -/3 }

Mise en évidence d'une valeur :

x	a	b	c
$f(x)$	1 ↘	2 2	↗ 3

\tkzTabVar{+/1 , -V-/**colorbox**{yellow}{2} , +/3}

Variation sur plusieurs colonnes :

x	a	b	c
$f(x)$	1 ↗		3

\tkzTabVar{-/1 , R/ , +/3}

Valeurs intermédiaires :

x	a	A	b	c
$f(x)$	1	x ↗		3

\tkzTabVal{1}{3}{0.25}{A}{x}

x	a		b	A	c
$f(x)$	1 ↗			x →	3

\tkzTabVal{1}{3}{0.75}{A}{x}

x	a	A	b	c
		⋮		
$f(x)$	1	x ↗		3

\tkzTabVal[draw]{1}{3}{0.25}{A}{x}

Ajout d'images :

x	a	b	c	d
$f(x)$	1	x ↗		3

\tkzTabIma{1}{4}{2}{x}

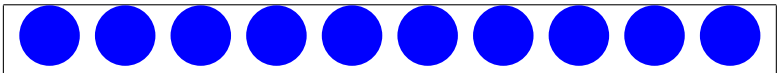
x	a	b	c	d
$f(x)$	1 ↗		x →	3

\tkzTabIma{1}{4}{3}{x}

15 Les répétitions

Utilisation du module pgffor chargé automatiquement avec Tikz

15.1 Répétition à 1 variable

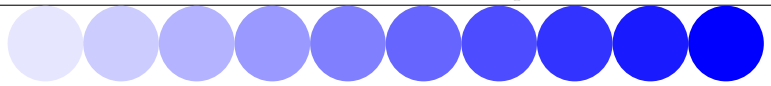


```
\tikz \foreach \x in {1,...,10} \fill[blue](\x,0) circle (0.4cm) ;
```

Variable \x : position en X

15.2 Répétition à 2 variables

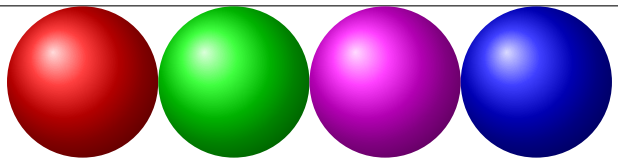
Liste de variables numériques



```
\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

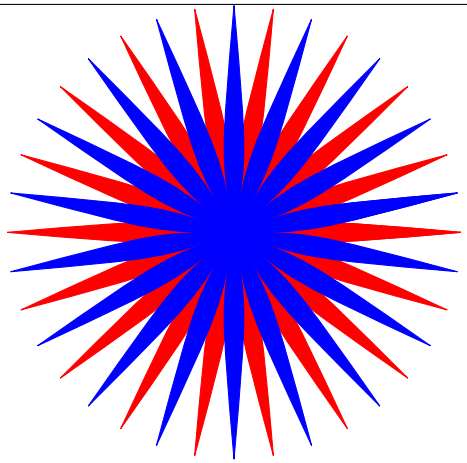
1,3	2,3	3,3	4,3	7,3	8,3	9,3	10,3
1,2	2,2	3,2	4,2	7,2	8,2	9,2	10,2
1,1	2,1	3,1	4,1	7,1	8,1	9,1	10,1

```
\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

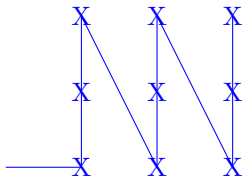


```
\begin{tikzpicture}
\foreach \x in 0,20,...,360{ \filldraw[red] (0,0) .. controls (\x+10 :1) .. (\x :1)
.. controls (\x-10 :1) .. (0,0) ;}
\foreach \x in 10,30,...,370{ \filldraw[blue] (0,0) .. controls (\x+10 :3) ..
(\x :3) .. controls (\x-10 :3) .. (0,0) ;}
\end{tikzpicture}
```

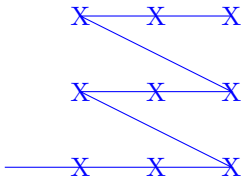
Variable \x : angle

15.3 Répétition à 2 variables - boucles imbriquées

Ordre des boucles imbriquées



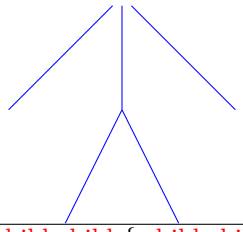
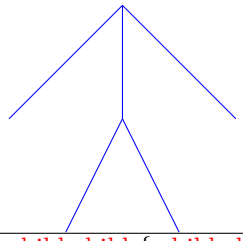
```
\begin{tikzpicture}
\draw (0,0)
\foreach \x in {1,2,3}
\foreach \y in {0,1,2}
{– (\x,\y) node{X}} ;
\end{tikzpicture}
```

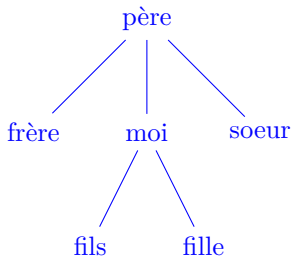


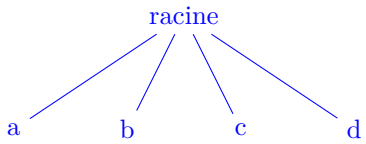
```
\begin{tikzpicture}
\draw (0,0)
\foreach \y in {0,1,2}
\foreach \x in {1,2,3}
{– (\x,\y) node{X}} ;
\end{tikzpicture}
```

16 Les diagrammes arborescents

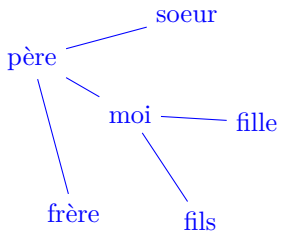
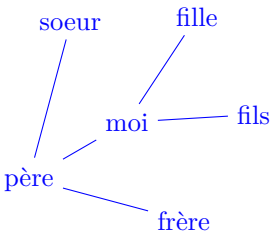
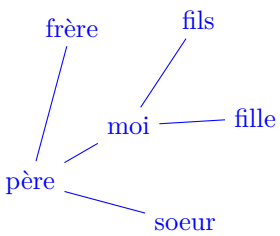
16.1 Structure

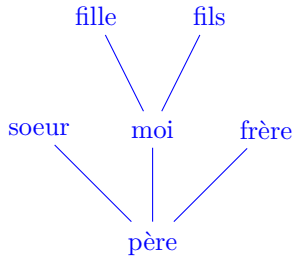
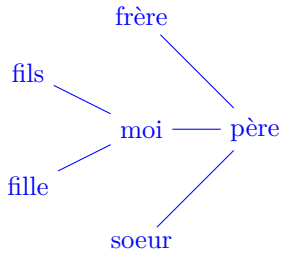
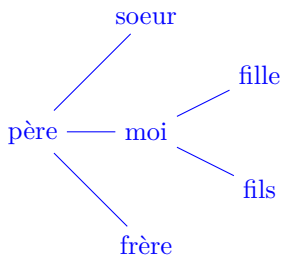
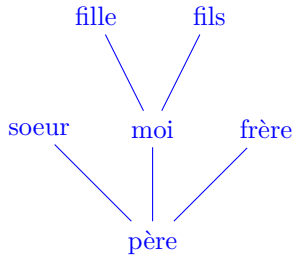
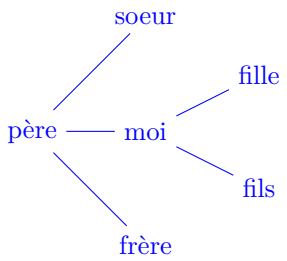
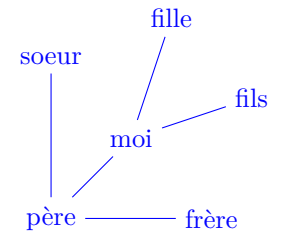
	
\node {} child child { child child } child ;	\coordinate child child { child child } child ;

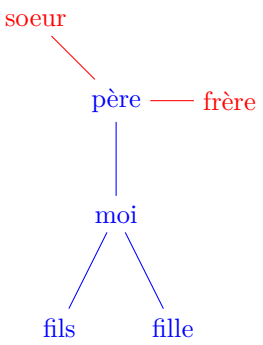
	\begin{tikzpicture} \node {père} child {node {frère}} child {node {moi} child {node {fils}} child {node {fille}}} child {node{soeur}} ; \end{tikzpicture}


\node {racine} child foreach \name in {a,b,c,d} {node {\name}} ;

16.2 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}} ;

16.3 Distance

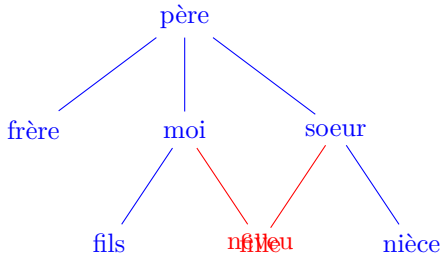
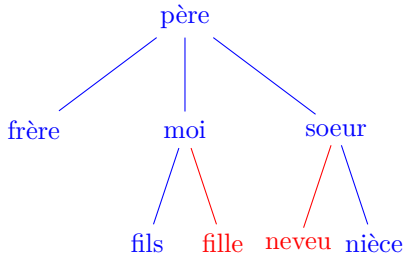
16.3.1 Distance père fils

père frère moi soeur fils fille	père moi soeur fille frère 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	

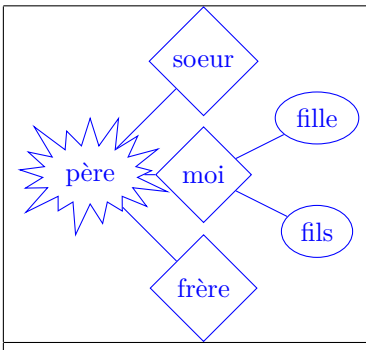
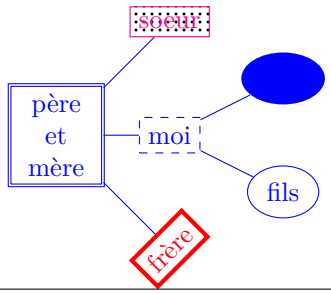
père frère moi soeur fils fille	père frère moi soeur fils fille
\node {père}[level 1/.style={level distance=1cm}]	\node {père}[level 2/.style={level distance=.5cm}]

16.3.2 Distance frère soeur

père frère moi soeur fils fille	père frère moi soeur fils fille
\node {père}[sibling distance=1cm,red]	\node {père}[sibling distance=3cm,red]
Par défaut : sibling distance=15 mm	

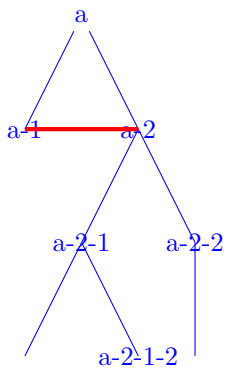
Problème	solution
	
[sibling distance=2cm]	[level 1/.style=sibling distance=2cm, level 2/.style=sibling distance=1cm]

16.4 Personnalisation des noeuds

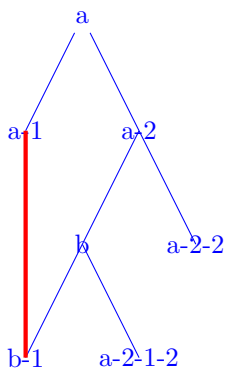
	\node[starburst [1] ,draw] {père}[grow=right] child {node[diamond,draw] frère} child {node[diamond,draw] moi child {node[ellipse,draw] fils} child {node[ellipse,draw] fille}} child {node[diamond,draw] soeur} ;
	\node[rectangle,double,draw,text width=1cm,text centered] {père}[grow=right,level distance=2cm] 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}} ;

1. autres types de nœuds voir pages 31 ,34 ,36, etc

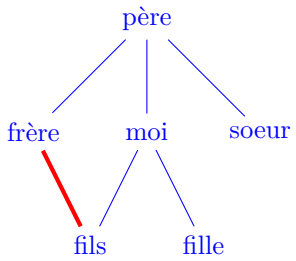
16.4.1 Nom des noeuds




```
\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);
```

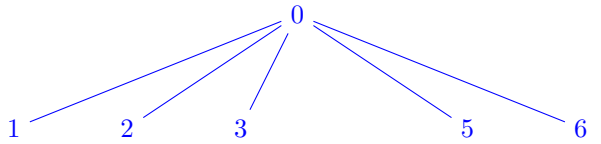



```
\node (a) {a}
child
child
child coordinate (b) child child
child
;
\node at (a-1) {a-1};
\node at (a-2) {a-2};
\node at (b) {b};
\node at (a-2-2) {a-2-2};
\node at (b-1) {b-1};
\node at (a-2-1-2) {a-2-1-2};

\draw[red,ultra thick] (a-1) – (b-1);
```



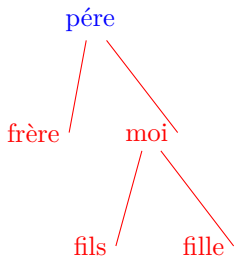
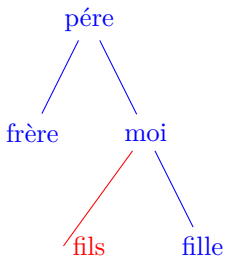

```
\node (a) {père}
child {node (b) {frère}}
child {node (c) {moi}
child {node (d) {fils}}
child {node (e) {fille}}}
child {node (f) {soeur}};

\draw[red,,ultra thick] (b) – (d);
```

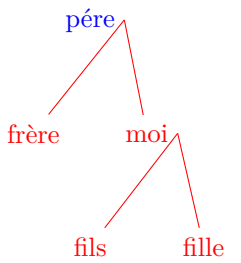
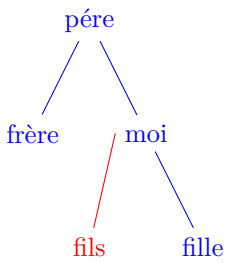
16.4.2 Omission d'un noeud



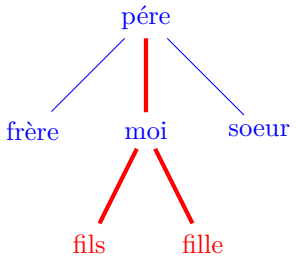
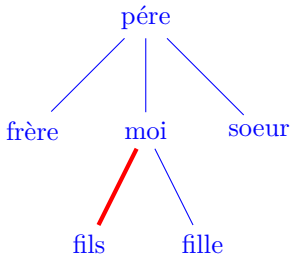
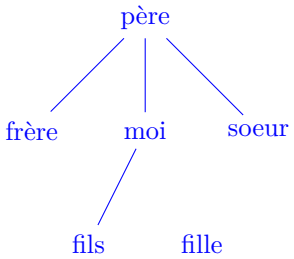

```
child[missing] {node {4} }
```

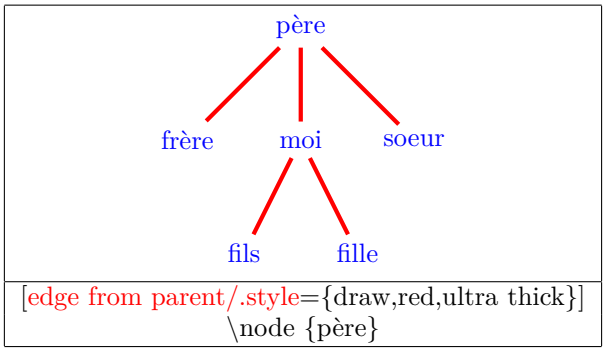
16.4.3 Modification du point d'accrochage

	
\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}} } ;

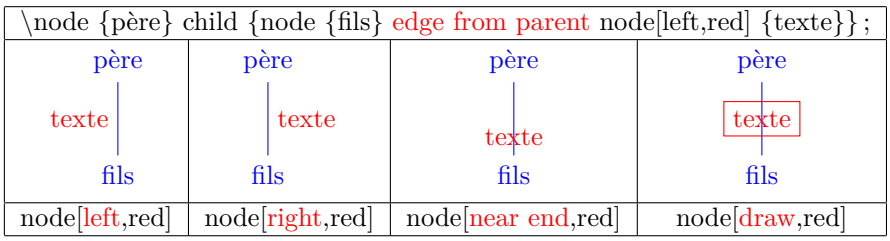
	
\node {pére} [parent anchor=east,red] child {node {frère}} child { node {moi} child {node {fils}} child {node {fils}} } ;	\node {pére} child {node {frère}} child { node {moi} child [parent anchor=west,red] {node {fils}} child {node {fils}} } ;

16.5 Liaison

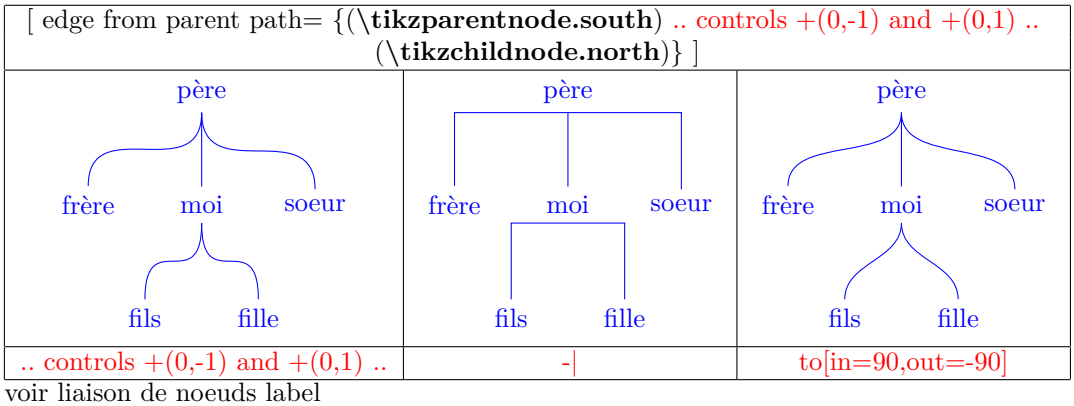
		
child {node {moi} edge from parent[red,ultra thick]	child {node {fils} edge from parent[red,ultra thick] }	child { node {fille} edge from parent[draw=none] }



16.5.1 Étiquetes sur liaisons



16.5.2 Personalisation des liaisons



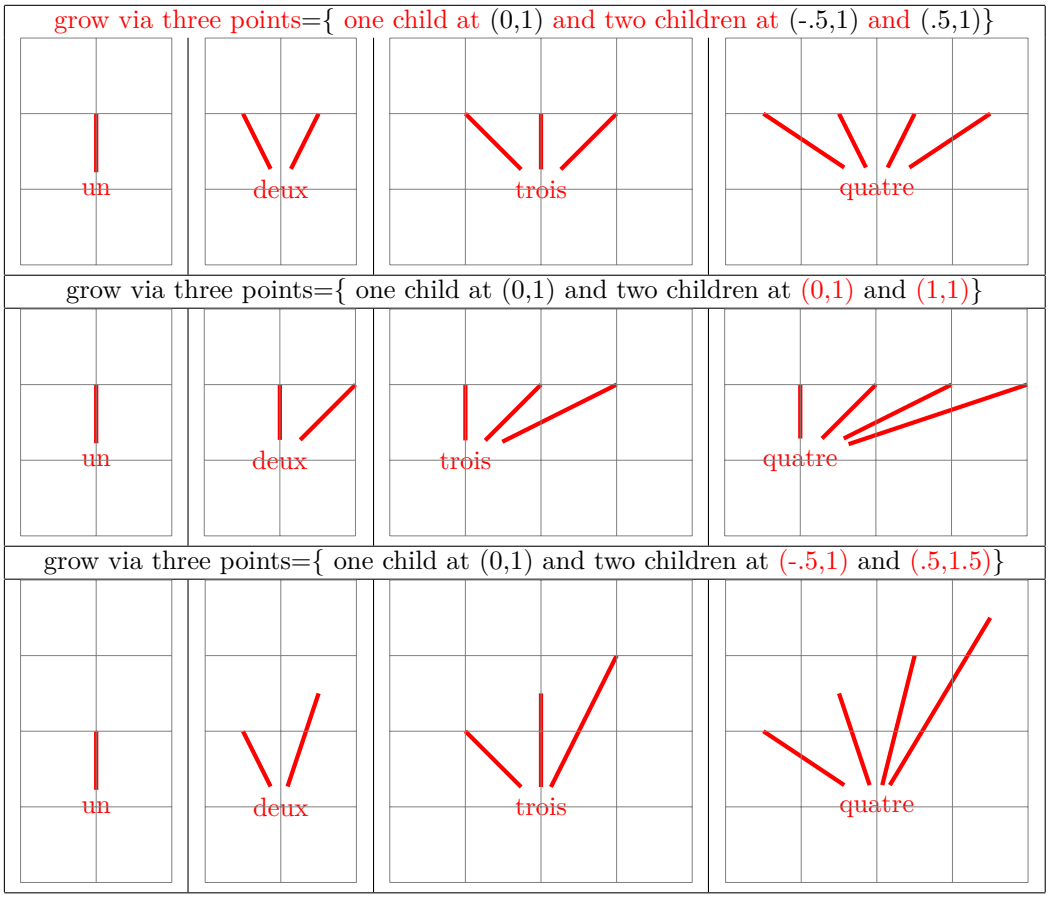
voir liaison de noeuds label

16.6 Options supplémentaires avec « library trees »

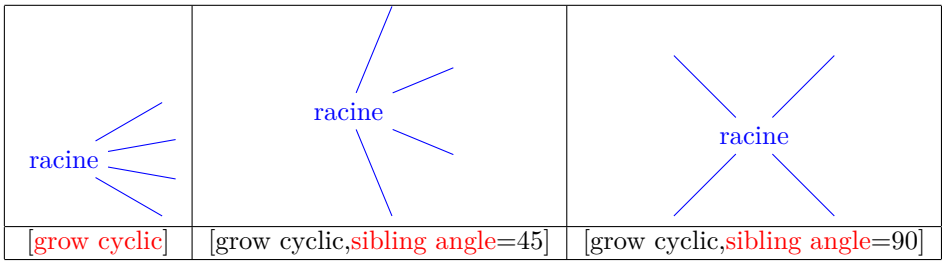
Insérer dans le préambule :

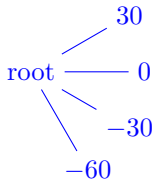
```
\usetikzlibrary{trees}
```

16.6.1 Positions d'un fils et de deux fils



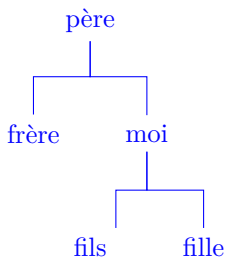
16.6.2 Liaison angulaire



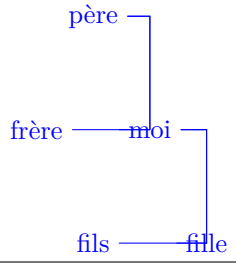



```
\node {racine} [clockwise from=30,sibling angle=30]

child {node {$30$} }
child {node {$0$} }
child {node {$-30$} }
child {node {$-60$ } } ;
```

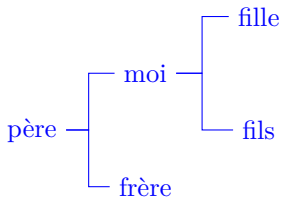
16.6.3 Liaisons en fourchette




```
\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}}
} ;
```

17 Les animations

Insérer dans le préambule :

```
\usepackage{animate}
```

17.1 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

17.2 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 ; \endACtikzpicture
% 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}
```

17.3 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)- - (\iAngle+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}
```

18 Les modules étudiés dans ce document

module de base tikz : insérer dans le préambule \usepackage{tikz}

Autres modules

nom	voir page	documentation[1]
animate	84	animate.pdf
tkz-tab	66	tkz-tab-screen.pdf

Compléments optionnels :

nom	voir page	A insérer dans le préambule
arrow	9	**\usetikzlibrary**{arrow}
patterns	8	\usetikzlibrary{patterns}
calc	14	\usetikzlibrary{calc}
backgrounds	26	\usetikzlibrary{backgrounds}
shapes.geometric	31	\usetikzlibrary{shapes.geometric}
shapes.symbols	34	\usetikzlibrary{shapes.symbols}
shapes.arrows	36	\usetikzlibrary{shapes.arrows}
shapes.callouts	38	\usetikzlibrary{shapes.callouts}
shapes.misc	40	\usetikzlibrary{shapes.misc}
shapes.multipart	42	\usetikzlibrary{shapes.multipart}
plotmarks	52	\usetikzlibrary{plotmarks}

calendar	dans une prochaine mise à jour	\usetikzlibrary{calendar}
automata	dans une prochaine mise à jour	\usetikzlibrary{automata}
backgrounds	dans une prochaine mise à jour	\usetikzlibrary{backgrounds}
chains	dans une prochaine mise à jour	\usetikzlibrary{chains}
circuits.ee	dans une prochaine mise à jour	\usetikzlibrary{circuits.ee}
circuits.logic	dans une prochaine mise à jour	\usetikzlibrary{circuits.logic}
decorations	dans une prochaine mise à jour	\usetikzlibrary{decorations}
er	dans une prochaine mise à jour	\usetikzlibrary{er}
external	dans une prochaine mise à jour	\usetikzlibrary{external}
fadings	dans une prochaine mise à jour	\usetikzlibrary{fadings }
fit	dans une prochaine mise à jour	\usetikzlibrary{fit}
fixedpointarithmetic	dans une prochaine mise à jour	\usetikzlibrary{fixedpointarithmetic}
folding	dans une prochaine mise à jour	\usetikzlibrary{folding}
fpu	dans une prochaine mise à jour	\usetikzlibrary{fpu}
intersections	dans une prochaine mise à jour	\usetikzlibrary{intersections}
lindenmayersystems	dans une prochaine mise à jour	\usetikzlibrary{lindenmayersystem}
matrix	dans une prochaine mise à jour	\usetikzlibrary{matrix}
mindmap	dans une prochaine mise à jour	\usetikzlibrary{mindmap}
petri	dans une prochaine mise à jour	\usetikzlibrary{petri}
plothandlers	dans une prochaine mise à jour	\usetikzlibrary{plothandlers}
positioning	dans une prochaine mise à jour	\usetikzlibrary{positioning }
profiler	dans une prochaine mise à jour	\usetikzlibrary{profiler}
scopes	dans une prochaine mise à jour	\usetikzlibrary{scopes}
shadings	dans une prochaine mise à jour	\usetikzlibrary{shadings}
shadows	dans une prochaine mise à jour	\usetikzlibrary{shadows}
shapes.gates.ee	dans une prochaine mise à jour	\usetikzlibrary{shapes.gates.ee }
shapes.gates.ee.IEC	dans une prochaine mise à jour	\usetikzlibrary{shapes.gates.ee.IEC }
shapes.gates.logic	dans une prochaine mise à jour	\usetikzlibrary{shapes.gates.logic.IEC}
shapes.gates.logic.IEC	dans une prochaine mise à jour	\usetikzlibrary{shapes.gates.logic.IEC}
shapes.gates.logic.US	dans une prochaine mise à jour	\usetikzlibrary{shapes.gates.logic.US}
spy	dans une prochaine mise à jour	\usetikzlibrary{spy}
svg.path	dans une prochaine mise à jour	\usetikzlibrary{svg.path}
through	dans une prochaine mise à jour	\usetikzlibrary{through}
topaths	dans une prochaine mise à jour	\usetikzlibrary{topaths}
trees	dans une prochaine mise à jour	\usetikzlibrary{trees}
turtle	dans une prochaine mise à jour	\usetikzlibrary{turtle}

Références

[1] pgfmanual.pdf version 2.10 726 pages

[2] pgfplots.pdf version 1.80 439 pages

[3] tkz-tab-screen.pdf version 1.1c 83 pages