Visuel PSTricks

Version 2.30

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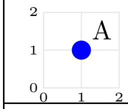
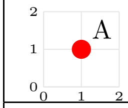
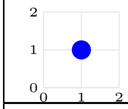
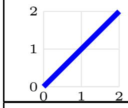
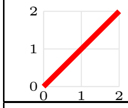
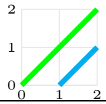
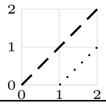
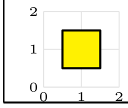
Objectifs :
— Avoir une image par commande ou par paramètre.
— Avoir un texte réduit au strict minimum.
— être le plus complet possible.

Légende :

	un nœud de base
	un nœud calculé
	un point
	un élément de baseBase element]
	un élément supplémentaire
	autres éléments supplémentaires
	construction pour expliquer une commande, une option ou un paramètre
	couleur de remplissage par défaut : blanc

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 :

Alain Bécue , Denis Bitouzé, Jean Côme charpentier, Martin Giese, Denis Girou, Alexander Grahn, Christophe Jorssen, Dr. Uwe Kern, Manuel Luque, Dominique Rodriguez, Michael Sharpe, Tobias Nähring, Herbert Voß, Timothy Van Zandt.

Quoi de neuf dans cette mise à jour

- Ajout des modules :
  - pst-bezier : voir page 29
  - pst-fun : voir page 102
  - pst-func : voir page 139
- différentes mises à jour du module pstricks-add :
  - pscspline : voir page 7
  - psellipseAB : voir page 7
  - Notion de chemin PSTricks : voir page 32
  - Commenter un élément : voir page 49
  - Homothétie : voir page 63
  - Commande psrotate : voir page 69
  - Annuler des objets : voir page 81
  - Des dés : voir page 102
  - paramètres d'un graphe en barres : voir page 121
  - Options VarStep et VarStepEpsilon : voir page 131
  - Macro psVectorfield : voir page 138

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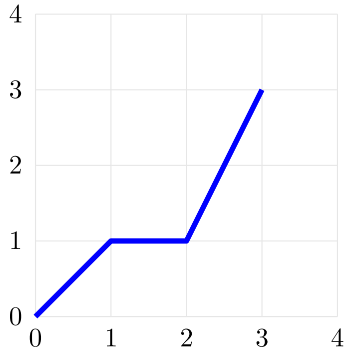
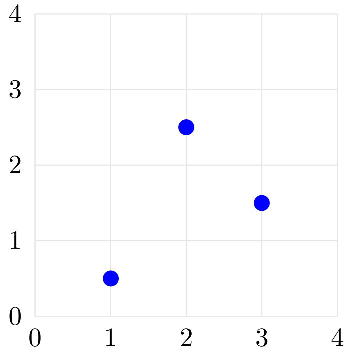
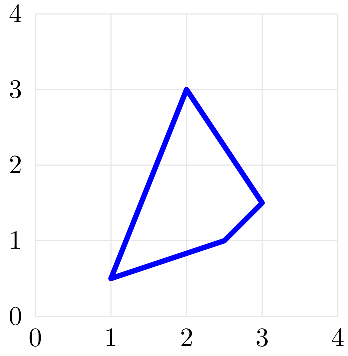
1 Les figures de base

1.1 Commandes sans astérisque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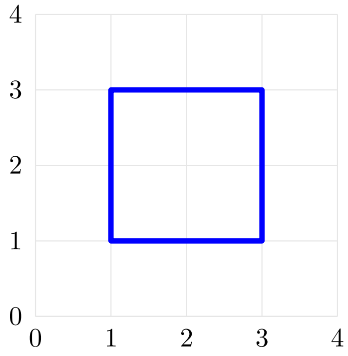	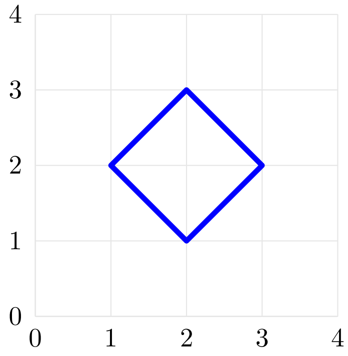	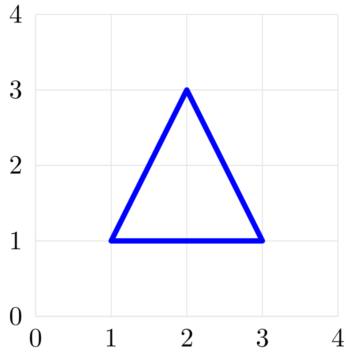
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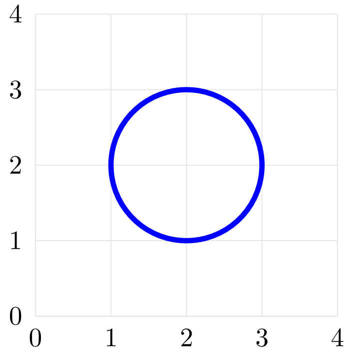	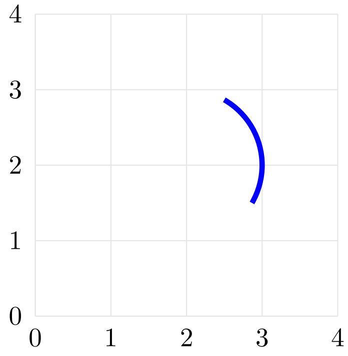	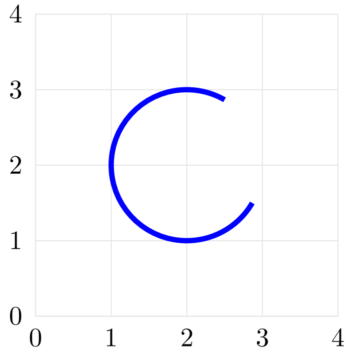
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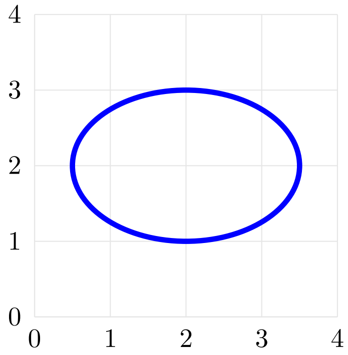
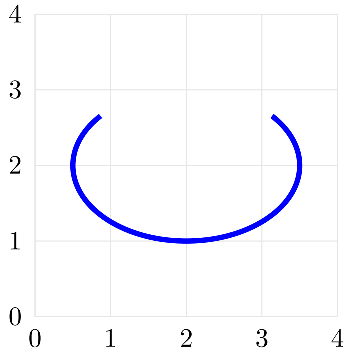
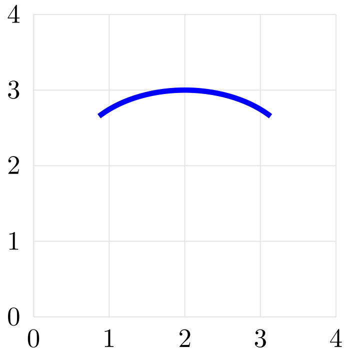
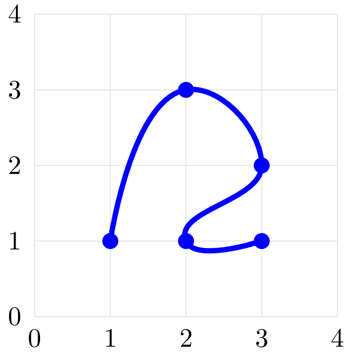
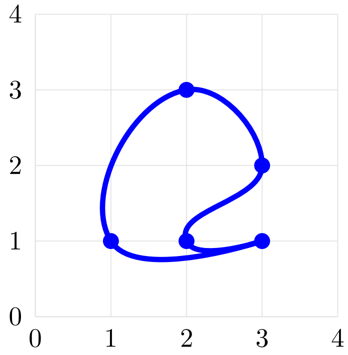
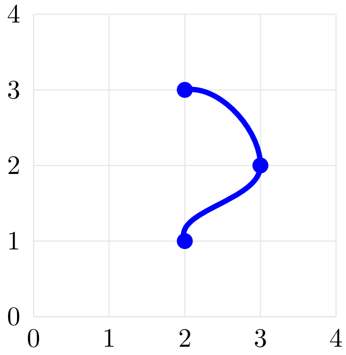
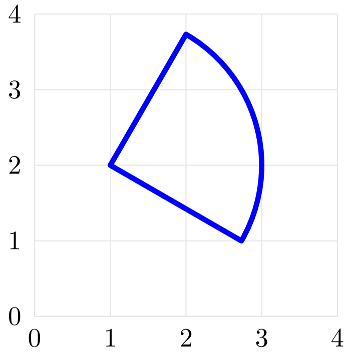
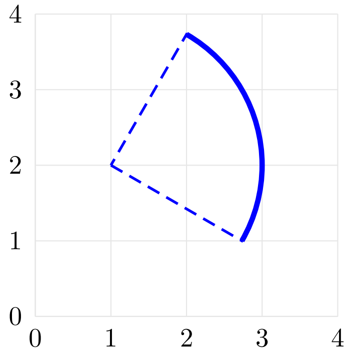
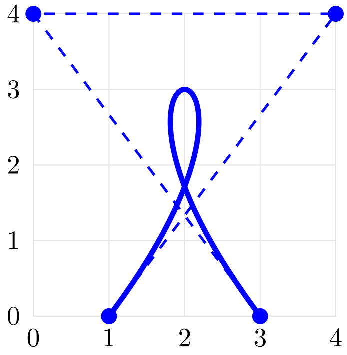
		
\psellipse (2, 2)(1.5,1)	**\psellipticarc** (2, 2)(1.5,1){150}{30}	**\psellipticarcn** (2, 2)(1.5,1){150}{30}

		
\pscurve[showpoints=true] (1,1)(2,3)(3,2)(2,1)(3,1)	**\psccurve**[showpoints=true] (1,1)(2,3)(3,2)(2,1)(3,1)	**\psecurve**[showpoints=true] (1,1)(2,3)(3,2)(2,1)(3,1)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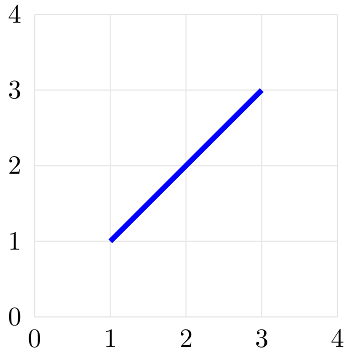
<td>
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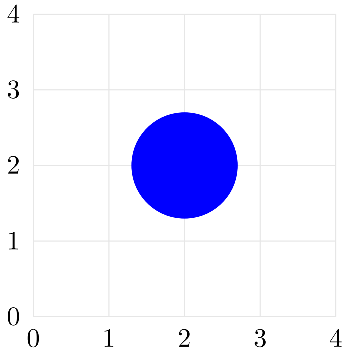
<td>
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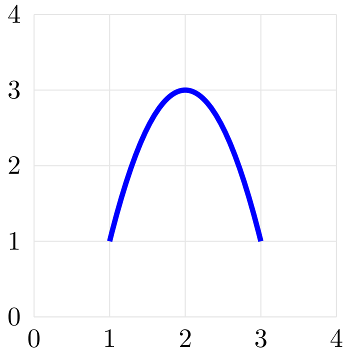
<td>
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<td>**\qline** (1,1)(3,3)</td>
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<td>**\psparabola**
(1,1)(2,3)</td>
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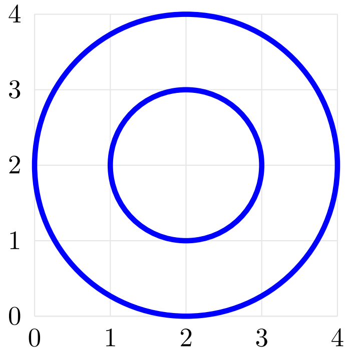
<td>
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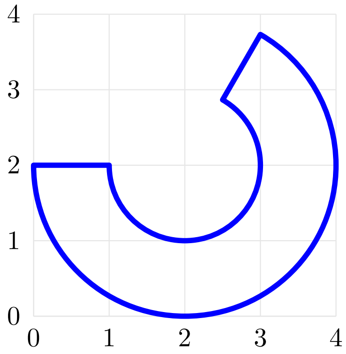
<td>
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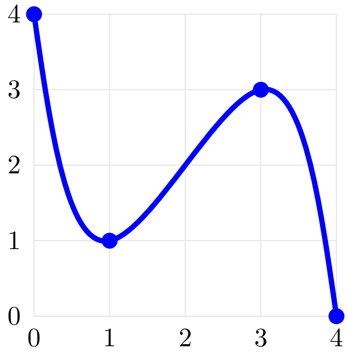
<td>
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<td>**\psRing** (2,2) [180,60] {1}{2}</td>
<td>**\pscspline**[showpoints](0,4)(1,1)(3,3)</td>
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<table>
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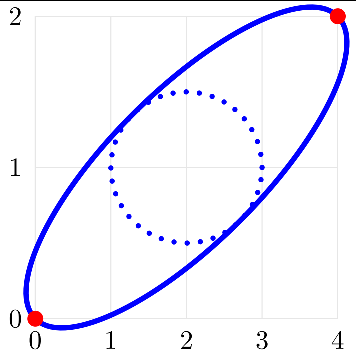
<td>
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\psdots[linecolor=red](0,0)(4,2)</td>
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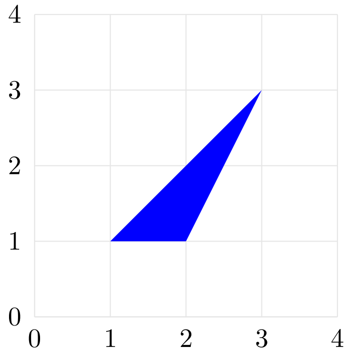
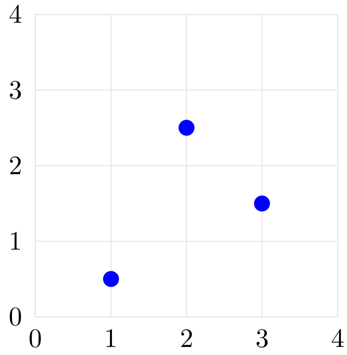
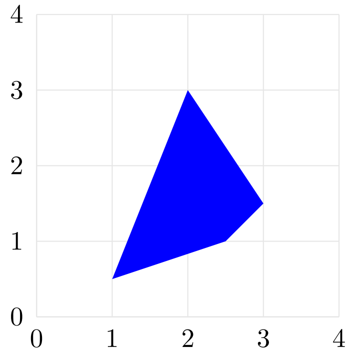
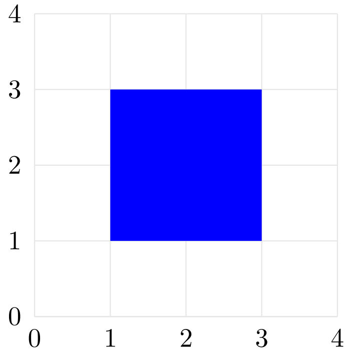
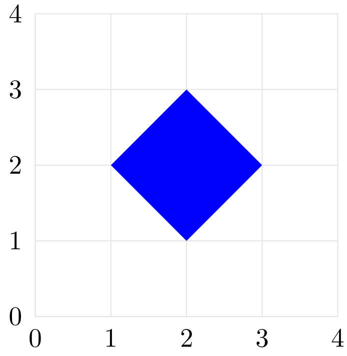
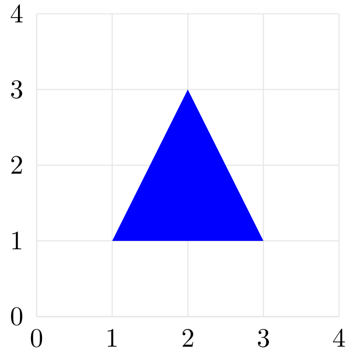
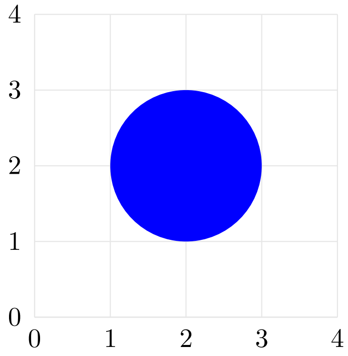
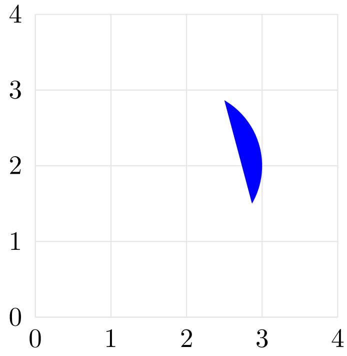
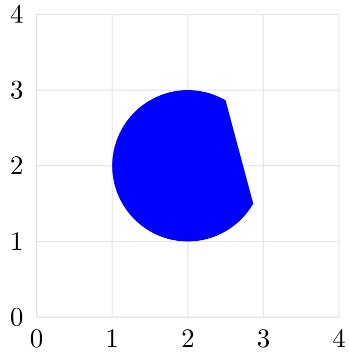
1.2 Commandes avec une astérisque

		
\psline* (0, 0)(1,1)(2,1)(3,3)	**\psdots*** (1,0.5)(2,2.5)(3,1.5)	**\pspolygon*** (1,0.5)(2,3)(3,1.5)(2.5,1)

		
\psframe* (1, 1)(3, 3)	**\psdiamond*** (2,2)(1,1)	**\pstriangle*** (2,1)(2,2)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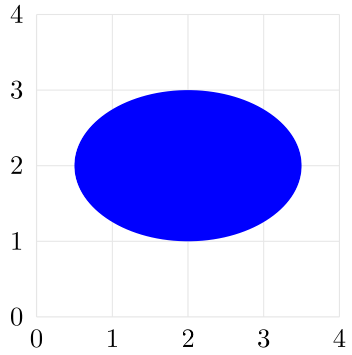

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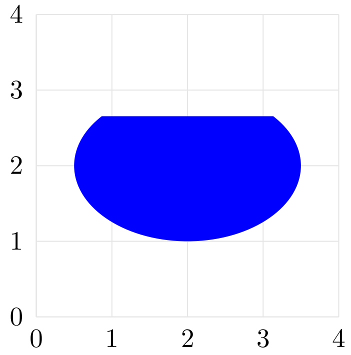
(2, 2)(1.5,1)



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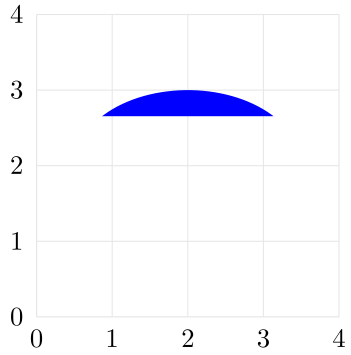

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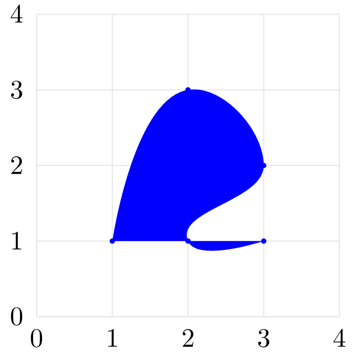

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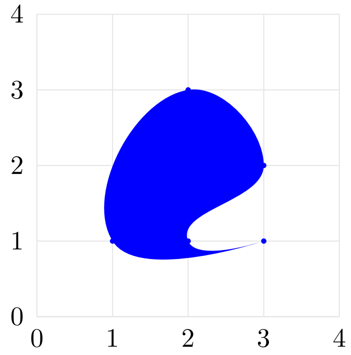

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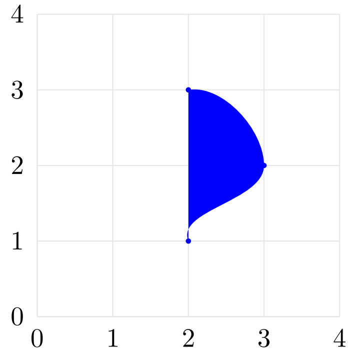

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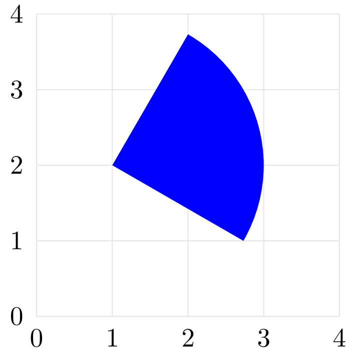

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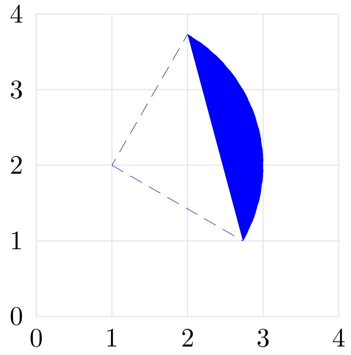

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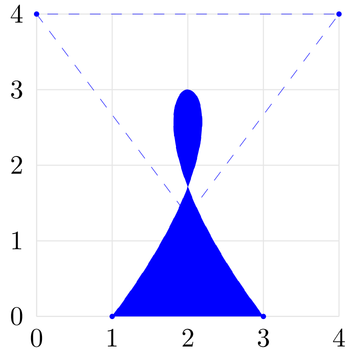

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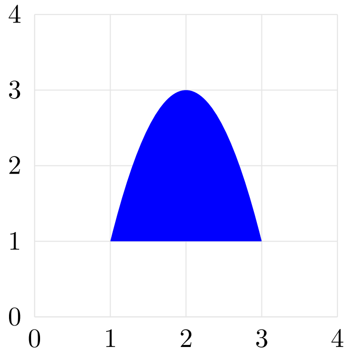
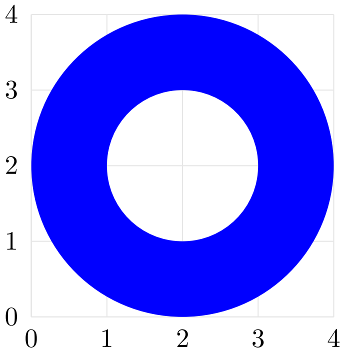
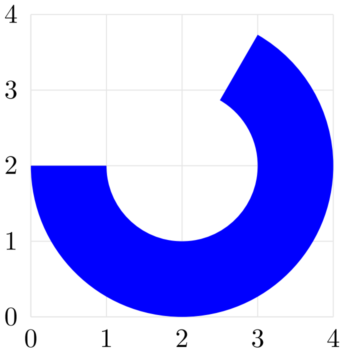
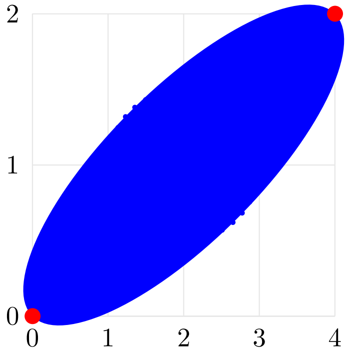
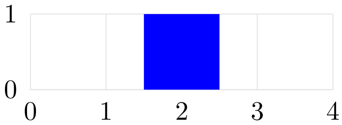
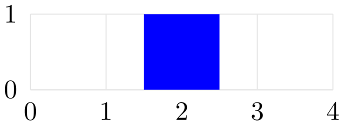
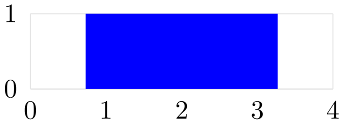
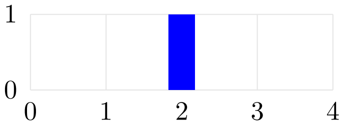
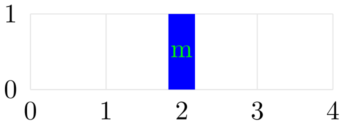
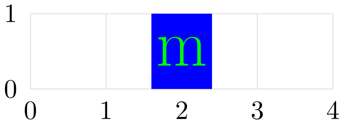
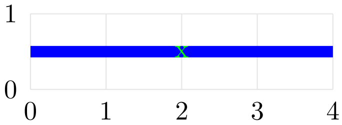
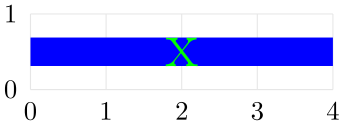
		
\psparabola (1,1)(2,3)	**\psRing** (2,2){1}{2}	**\psRing** (2,2) [180,60] {1}{2}

	**\psellipseAB***(0,0)(4,2){1} \pscircle[linestyle=dotted](2,1){1} \psdots[linecolor=red](0,0)(4,2)

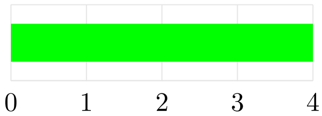
2 Les paramètres disponibles

2.1 Epaisseur du trait

	`\psline[linewidth=10mm](2,0)(2,1)`
	`\psline[linewidth=1cm](2,0)(2,1)`
	`\psline[linewidth=1in](2,0)(2,1)`
	`\psline[linewidth=10pt](2,0)(2,1)`
Par défaut : linewidth = 0.8pt	

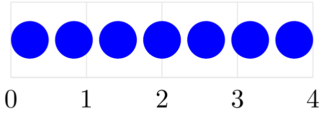
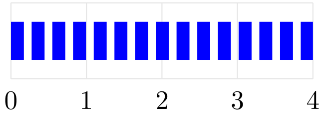
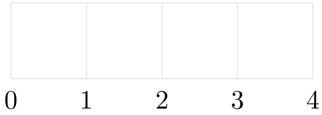
*D*imensions en fonction de la taille de la police	
	`\psline[linewidth=1em](2,0)(2,1)`
	`{\Huge \psline[linewidth=1em](2,0)(2,1) }`
	`\psline[linewidth=1ex](0,0.5)(4,0.5)`
	`{\Huge \psline[linewidth=1ex](0,0.5)(4,0.5) }`

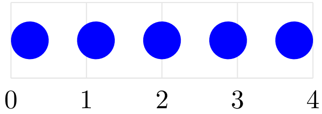
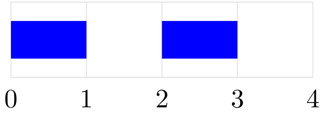
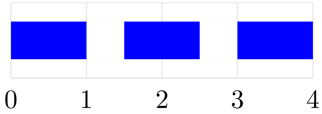
2.2 Couleur de ligne

	`\psline [linewidth=0.5cm,linecolor=green ] (4,0)`

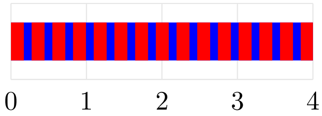
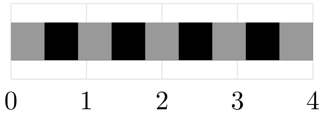
Couleurs disponibles									
black	darkgray	gray	lightgray	white	red	green	blue	cyan	magenta
■	■	■	■		■	■	■	■	■
brown	lime	olive	orange	pink	purple	teal	violet	yellow	
■	■	■	■	■	■	■	■	■	
Par défaut : linecolor = black									

2.3 Styles de ligne

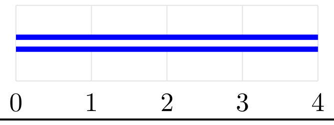
	\psline[linewidth=0.5cm,linestyle= dotted](4,0)
	\psline[linewidth=0.5cm,linestyle= dashed](4,0)
	\psline[linewidth=0.5cm,linestyle= none](4,0)
Par défaut : linestyle = solid	

	\psline[linewidth=0.5cm,linestyle= dotted ,dotsep =1cm](4,0)
	\psline[linewidth=0.5cm,linestyle= dashed ,dash=1cm](4,0)
	\psline[linewidth=0.5cm,linestyle= dashed , dash=1cm 0.5cm](4,0)
Par défaut : dotsep = 3pt dashsep= 5pt 3pt	

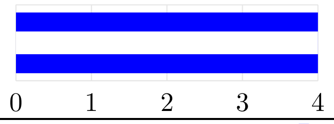
Nouvelle option : dashcolor [15]

	\psline[linewidth=.5cm,linestyle=dashed,dashcolor=red](0,0)(4,0)
	\psline[linewidth=0.5cm,linestyle=dashed, linecolor=black,dashcolor=black!40,dash=5mm 5mm](0,0)(4,0)

2.4 Lignes doubles

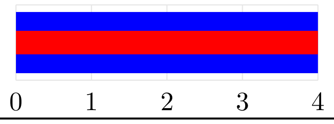


```
\psline[doubleline=true](4,0)
```



```
\psline[linewidth=0.25cm,doubleline=true,doublesep=.3cm](4,0)
```

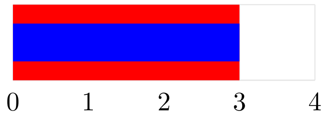
Par défaut : doublesep = 1.25\pslinewidth



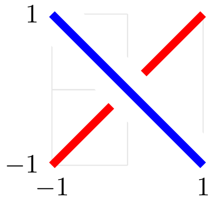
```
\psline[linewidth=0.25cm,doubleline=true,doublecolor=red](4,0)
```

Par défaut : doublecolor = white

2.5 Bordure de ligne

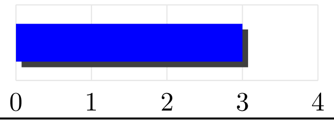


```
\psline[linewidth=0.5cm,border=0.25cm,bordercolor=red](3,0)
```



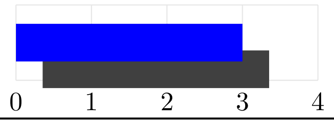
```
\psline[linewidth=3pt,linecolor=red](-1,-1)(1,1)
\psline[linewidth=3pt,linecolor=blue,border==0.25cm](1,-1)(-1,1)
```

2.6 Ombrage de ligne



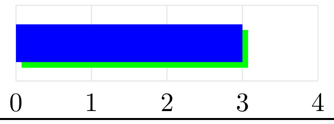
```
\psline[linecolor=red,shadow=true](3,0)
```

Par défaut : shadow = false



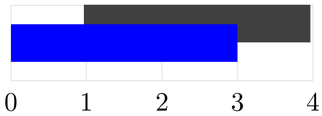
```
\psline[linewidth=.5cm,shadow=true,shadowsize=.5cm](3,0)
```

Par défaut : shadowsize = 3pt

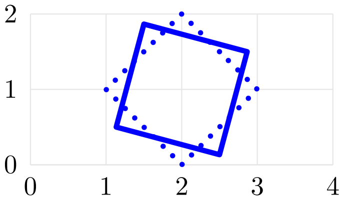


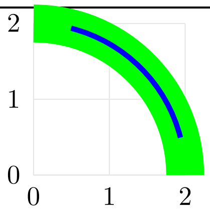
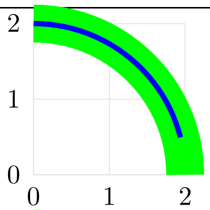
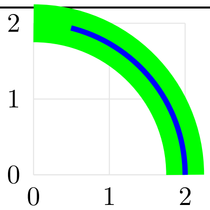
```
\psline[linewidth=.5cm,shadow=true,shadowcolor=green](3,0)
```

Par défaut : shadowcolor = darkgray

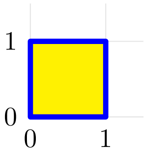
	\psline[linewidth=.5cm,shadow=true,shadowsize=1cm, shadowangle=15](3,0)
Par défaut : ,shadowangle = - 45	

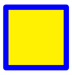
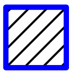
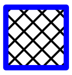
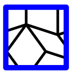
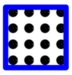
2.7 Paramètres spécifiques

\psdiamond	
	\psdiamond[linestyle=dotted](2,1)(1,1) \psdiamond[gangle=30](2,1)(1,1)

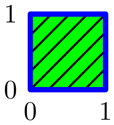
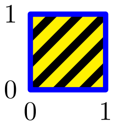
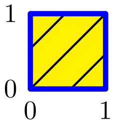
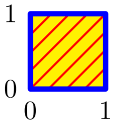
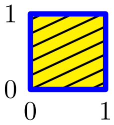
\pssarc	
	\psarc[linecolor=green,linewidth=0.5cm](0,0){2}{0}{90} \psarc[arcsep=1cm](0,0){2}{0}{90}
	\psarc[linecolor=green,linewidth=0.5cm](0,0){2}{0}{90} \psarc[arcsepA=1cm](0,0){2}{0}{90}
	\psarc[linecolor=green,linewidth=0.5cm](0,0){2}{0}{90} \psarc[arcsepB=1cm](0,0){2}{0}{90}

2.8 Remplissage de surface

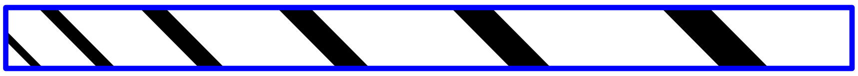
	\psframe[fillstyle=solid](1,1)

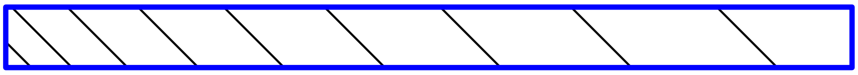
Types de remplissages disponibles						
none	solid	vlines	hlines	crosshatch	penrose	dots
						
		vlines*	hlines*	crosshatch*	penrose*	
						

Options disponibles :

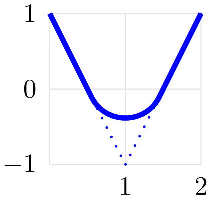
	\psframe[fillstyle=hlines*,fillcolor=green](1,1)
fillcolor = white	
	\psframe[fillstyle=hlines*,hatchwidth=3pt](1,1)
hatchwidth = 0.8pt	
	\psframe[fillstyle=hlines*,hatchsep=10pt](1,1)
hatchsep = 4pt	
	\psframe[fillstyle=hlines*,hatchcolor=red](1,1)
hatchcolor = black	
	\psframe[fillstyle=hlines*,hatchangle=25](1,1)
hatchangle = 45	

Nouvelle option : hatchwidthinc hatchsepinc [13]

\psframe[fillstyle=vlines,hatchwidthinc=2pt](14,1)


\psframe[fillstyle=vlines,hatchsepinc=2pt](14,1)


2.9 Coins arrondis

	\psline[linearc=0.5cm](0,1)(1,-1)(2,1) \psline[linestyle=dotted](0,1)(1,-1)(2,1)
Par défaut : linearc = 0	

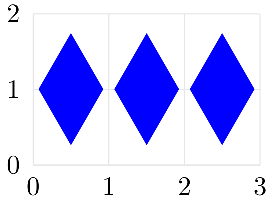
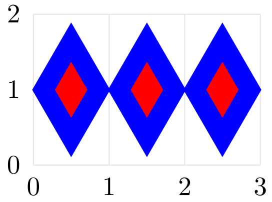
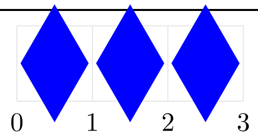
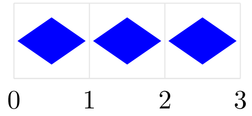
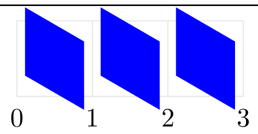
2.10 Types de points

\psdots [dotstyle=pentagon*](.5,0)(1.5,0)(2.5,0)			⬟ ⬟ ⬟
*	● ● ●	o	○ ○ ○
x	× × ×	+	+ + +
Bo	○ ○ ○	B+	+ + +
asterisk	∗ ∗ ∗	Basterisk	✱ ✱ ✱
Asterisk	✻ ✻ ✻	BoldAsterisk	✱ ✱ ✱
SolidAsterisk	⊛ ⊛ ⊛	oplus	⊕ ⊕ ⊕
BoldOplus	⊕ ⊕ ⊕	SolidOplus	⊕ ⊕ ⊕
otimes	⊗ ⊗ ⊗	|	| | |
square	□ □ □	Bsquare	□ □ □
square*	■ ■ ■	diamond	◇ ◇ ◇
diamond*	◆ ◆ ◆	triangle	△ △ △
Btriangle	△ △ △	triangle*	▲ ▲ ▲
pentagon	⬠ ⬠ ⬠	Bpentagon	⬠ ⬠ ⬠
pentagon*	⬟ ⬟ ⬟	Hexagon	⬡ ⬡ ⬡
BoldHexagon	⬡ ⬡ ⬡	SolidHexagon	⬢ ⬢ ⬢
Octogon	○ ○ ○	BoldOctogon	○ ○ ○
SolidOctogon	● ● ●		
Par défaut : dotstyle = *			

---

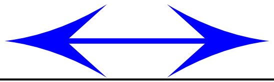
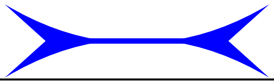
[1] linecolor=blue,fillcolor=yellow

2.11 Paramètres des points

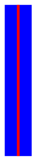
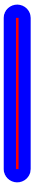
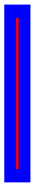
<table>
<tr><td></td><td>\psdots[dotstyle=diamond*, dotsize= 1cm] (0.5,0)(1.5,0)(2.5,0)</td></tr>
<tr><td></td><td>\psdots[dotstyle=diamond*, dotsize= 0.5cm 10]
(0.5,0)(1.5,0)(2.5,0)
\psdots[linecolor=red,dotstyle=diamond*, dotsize= 0.5cm]
(0.5,0)(1.5,0)(2.5,0)</td></tr>
<tr><td colspan="2">dotsize= 0.5pt 2.5</td></tr>
<tr><td></td><td>\psdots[dotstyle=diamond*, dotscale= 5]
(0.5,0)(1.5,0)(2.5,0)</td></tr>
<tr><td></td><td>\psdots[dotstyle=diamond*, dotscale= 5 2] (0.5,0)(1.5,0)(2.5,0)</td></tr>
<tr><td colspan="2">dotscale= 1</td></tr>
<tr><td></td><td>\psdots[dotstyle=diamond*,dotscale= 5, dotangle= 30]
(0.5,0)(1.5,0)(2.5,0)</td></tr>
<tr><td colspan="2">dotangle= 0</td></tr>
</table>

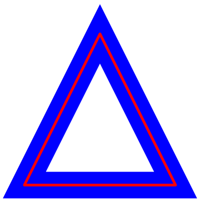
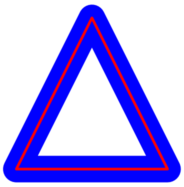
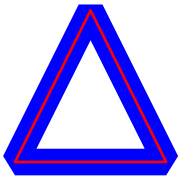
3 Les extrémités

3.1 Les types d'extrémités disponibles

Extrémités à l'échelle 2			
{-}			
{<->}		{>-<}	
{«-»}		{»-«}	
{|-| }		{|*-|*}	
{[-]}		{]-[}	
{(-)}		{)-(}	
{o-o}		{*-*}	
{oo-oo}		{**-**}	
{|<->|}		{|>-<|}	
{|<->|}		{|>-<|}	
{h-h}		{H-H}	
{v-v}		{V-V}	
{f-f}		{F-F}	
{t-t}		{T-T}	
{<D-D>}		{D>-<D}	
Largeur de ligne : 0,3cm			
{-}		{c-c}	
{C-C}		{cc-cc}	

3.2 Linejoin linecap [14]

\psline[linecap=0,linewidth=10pt](2,0.5)(2,2.5)		
		
linecap=0	linecap=1	linecap=2

\pstriangle[linejoin=0,linewidth=10pt] (2,0.5)(2,2)		
		
linejoin=0	linejoin=1	linejoin=2

3.3 Flèches multiples

nArrows	
	
\psline[nArrows=5]{»-»}(0.5,0)(5,0)	\psline[nArrows=5]{«-«}(0.5,0)(5,0)

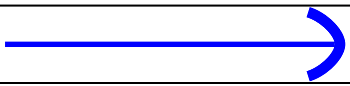
nArrowsA ArrowsB	
	
\psline[nArrowsA=5]{»-»}(0.5,0)(5,0)	\psline[nArrowsB=5]{»-»}(0.5,0)(5,0)
	
\psline[nArrowsA=5]{«-«}(0.5,0)(5,0)	\psline[nArrowsB=5]{«-«}(0.5,0)(5,0)

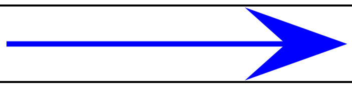
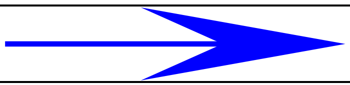
3.4 Paramètres des extrémités

	
\psline[Arrowsize=3pt 3]{->}	\psline[arrowlength= 5]{->}
Par défaut : arrowsize= 1.5pt 2	Par défaut : arrowlength= 1.4

	
\psline[arrowinset=0]{->}	\psline[arrowinset=.8]{->}
Par défaut : arrowinset=.4 (40%)	

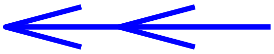
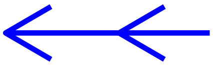
	
linewidth=2pt	linewidth=4pt
\psline[tbarsize=4pt 2]{|<-|}	Par défaut : tbarsize=2pt 5

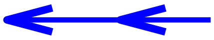
	
\psline[bracketlength=.5]{-]}	\psline[rbracketlength=.5]{-)}
Par défaut : bracketlength= 0.15	Par défaut : rbracketlength=0.15

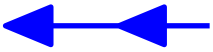
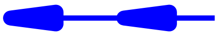
	
\psline[arrowscale=5]{->}	\psline[arrowscale= 5 10]{->}
Par défaut : arrowscale=1	

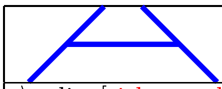
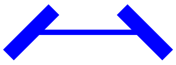
	
\psline[hooklength=10mm]{-H}	\psline[hookwidth=3mm]{-H}
Par défaut : hooklength=3mm	Par défaut : hookwidth=1mm

	
\psline[arrowLW=1pt]{o-*}	\psline[arrowLW=1mm]{*-o}

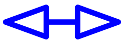
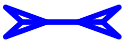
	
\psline[veearrowlength=.5cm]{v-V}	\psline[veearrowangle=60]{v-V}
Par défaut : veearrowlength = 3mm	Par défaut : veearrowangle = 30

	
\psline[veearrowlinewidth =.5mm]{v-V}	\psline[filledveearrowlength = 5mm]{f-F}
Par défaut : veearrowlinewidth = 0.35mm	Par défaut : filledveearrowlength = 3mm

	
\psline[filledveearrowangle = 45]{f-F}	\psline[filledveearrowlinewidth =1mm]{f-F}
Par défaut : filledveearrowangle = 15	Par défaut : filledveearrowlinewidth =0.35mm

	
\psline[tickarrowlength=2.5mm]{t-T}	\psline[tickarrowlinewidth=1mm]{t-T}
Par défaut : tickarrowlength= 1.5mm	Par défaut : tickarrowlinewidth=0.35mm

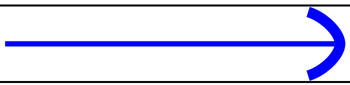
	
\psline[arrowlinestyle=dotted]{t-T}	\psline[arrowlinestyle=dashed]{v-V}
arrowlinestyle= solid	

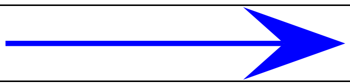
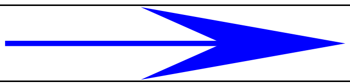
	
\psline[ArrowFill=false,arrowinset=0]{>-<}	\psline[ArrowFill=false]{>-<}

	
\psline[Arrowsize=3]{->}	\psline[arrowlength= 5]{->}
Par défaut : arrowsize= 1.5pt 2	Par défaut : arrowlength= 1.4

	
\psline[arrowinset=0]{->}	\psline[arrowinset=.8]{->}
Par défaut : arrowscale=.4 (40%)	

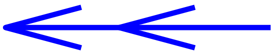
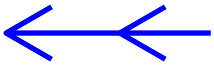
	
linewidth=2pt	linewidth=4pt
\psline[tbarsize=4pt 2]{|<-|}	Par défaut : tbarsize=2pt 5

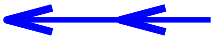
	
\psline[bracketlength=.5]{-]}	\psline[rbracketlength=.5]{-)}
Par défaut 0.15	Par défaut 0.15

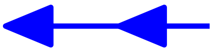
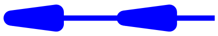
	
\psline[arrowscale=5]{-]}	\psline[arrowscale= 5 10]{-)}
Par défaut : arrowscale=1	

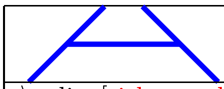
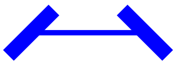
	
\psline[hooklength=10mm]{-H}	\psline[hookwidth=3mm]{-H}
Par défaut : hooklength=3mm	Par défaut : hookwidth=1mm

	
\psline[arrowLW=1pt]{o-*}	\psline[arrowLW=1mm]{*-o}

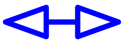
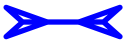
	
\psline[veearrowlength=.5cm]{v-V}	\psline[veearrowangle=60]{v-V}
Par défaut : veearrowlength = 3mm	Par défaut : veearrowangle = 30

	
\psline[veearrowlinewidth=.5mm]{v-V}	\psline[filledveearrowlength = 5mm]{f-F}
Par défaut : veearrowlinewidth = 0.35mm	Par défaut : filledveearrowlength = 3mm

	
\psline[filledveearrowangle = 45]{f-F}	\psline[filledveearrowlinewidth =1mm]{f-F}
Par défaut : filledveearrowangle = 15	Par défaut : filledveearrowlinewidth =0.35mm

	
\psline[tickarrowlength=2.5mm]{t-T}	\psline[tickarrowlinewidth=1mm]{t-T}
Par défaut : tickarrowlength= 1.5mm	Par défaut : tickarrowlinewidth=0.35mm

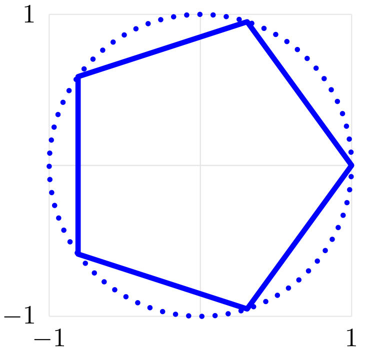
	
\psline[arrowlinestyle=dotted]{t-T}	\psline[arrowlinestyle=dashed]{v-V}
arrowlinestyle= solid	

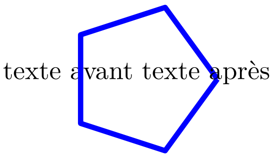
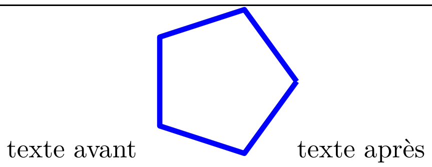
	
\psline[ArrowFill=false,arrowinset=0]{>-<}	\psline[ArrowFill=false]{>-<}

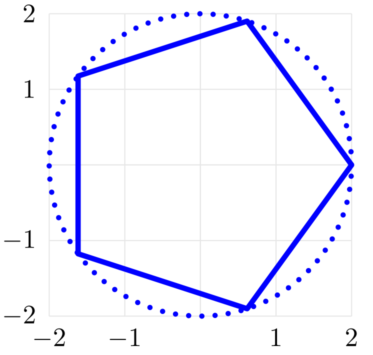
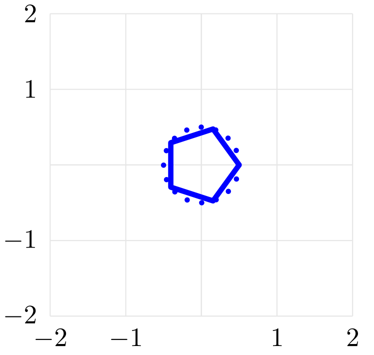
4 Des polygones avec pst poly [19]

5 Des polygones avec pst poly

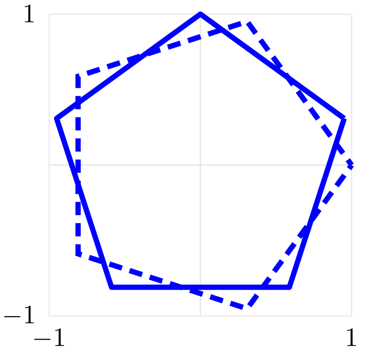
Utilisation du module pst-poly (consultez le fichier pst-poly-doc.pdf)


\PstPolygon \pscircle[linestyle=dotted]{1}

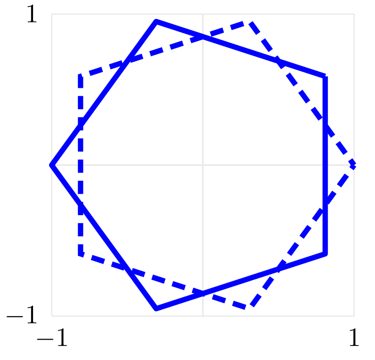
	
texte avant \PstPolygon[PstPicture=false] texte après	texte avant \PstPolygon[PstPicture=true] texte après
Par défaut : PstPicture=true	

	
\PstPolygon[unit=2] \pscircle[linestyle=dotted]{2}	\PstPolygon[unit=.5] \pscircle[linestyle=dotted]{.5}

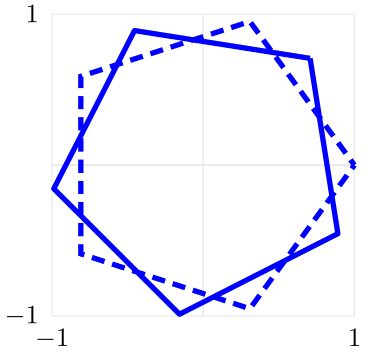
5.1 Options



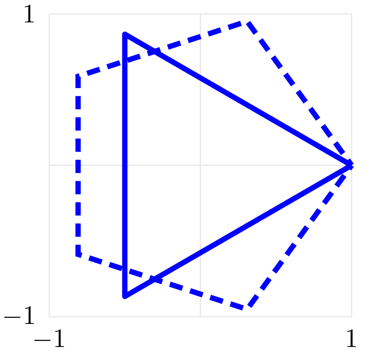
PolyRotation=18



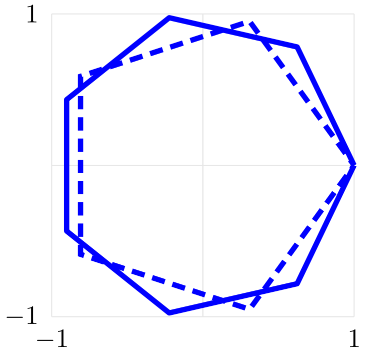
PolyRotation=36



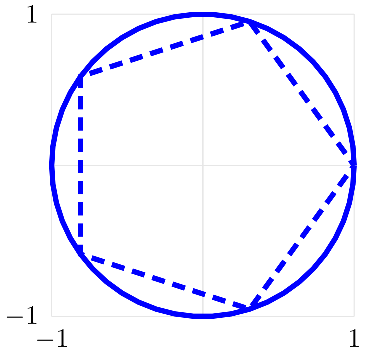
PolyRotation=45



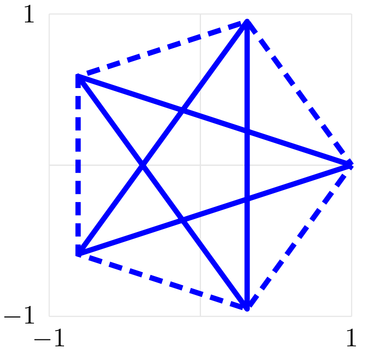
PolyNbSides=3



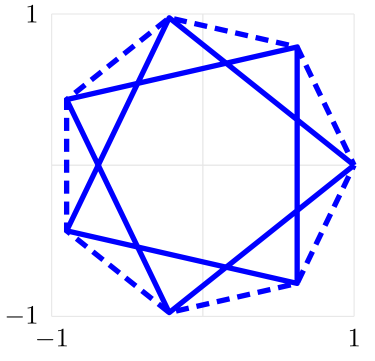
PolyNbSides=7



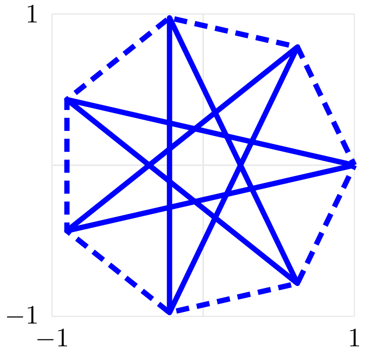
PolyNbSides=50



PolyOffset=2



PolyOffset=2
PolyNbSides=7



PolyOffset=4
PolyNbSides=7

<table>
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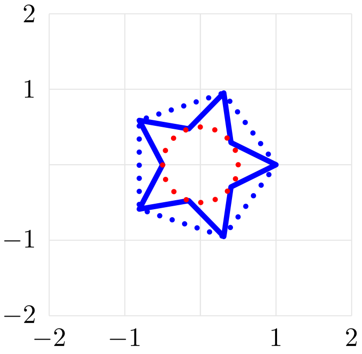
<td>
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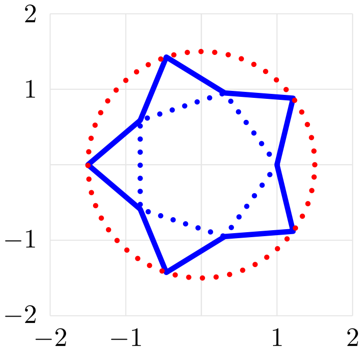
<td>
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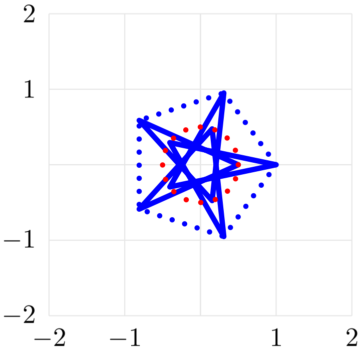
<td>
</td>
</tr>
<tr>
<td>[PolyIntermediatePoint=0.5]
\pscircle{0.5}</td>
<td>[PolyIntermediatePoint=1.5]
\pscircle{1.5}</td>
<td>[PolyIntermediatePoint=-0.5]
\pscircle{.5}</td>
</tr>
</table>

<table>
<tr><th colspan="3">\PstPolygon[PolyIntermediatePoint=0.5,PolyCurves=true]</th></tr>
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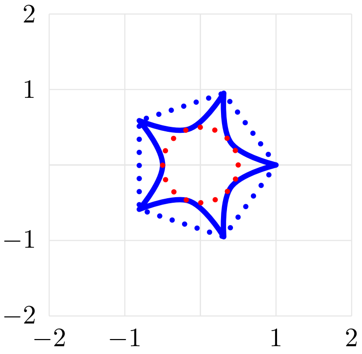
<td>
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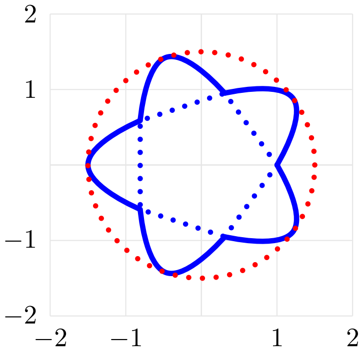
<td>
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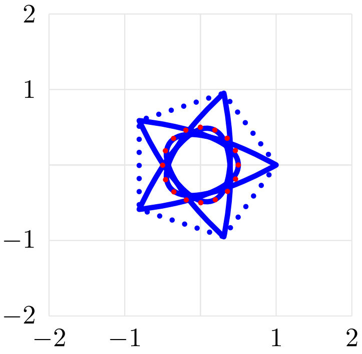
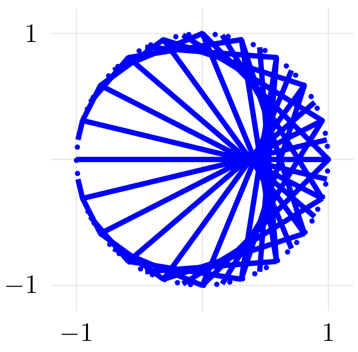
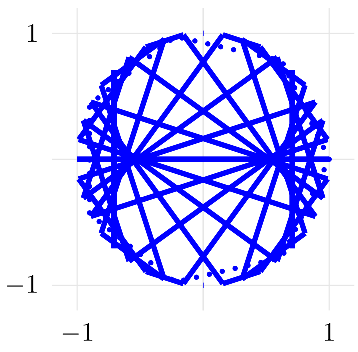
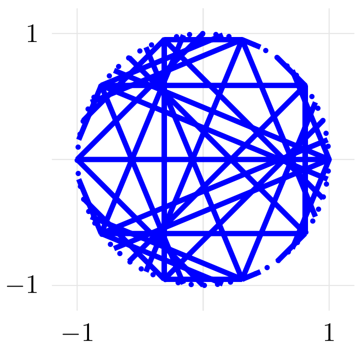
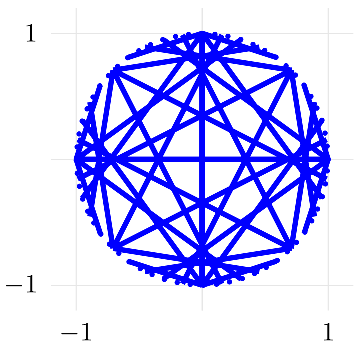
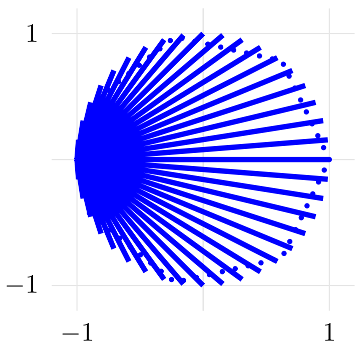
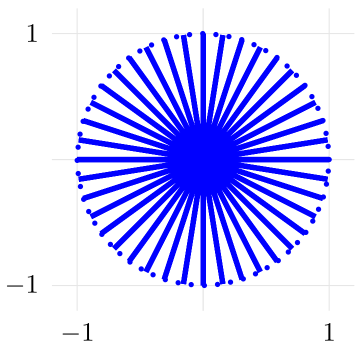
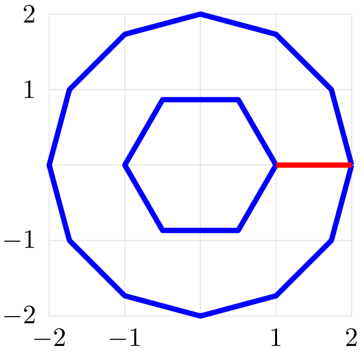
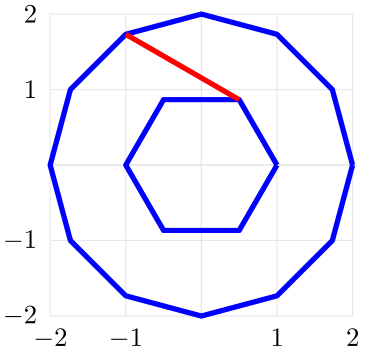
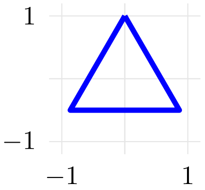
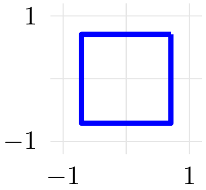
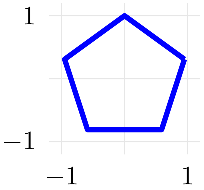
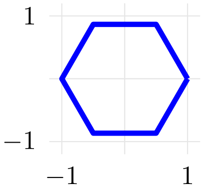
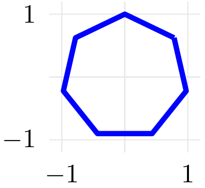
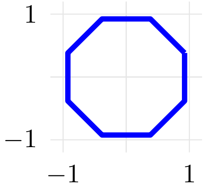
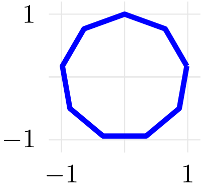
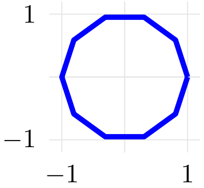
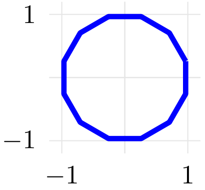
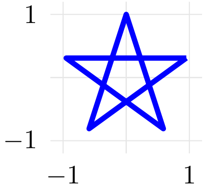
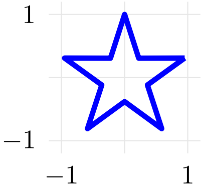
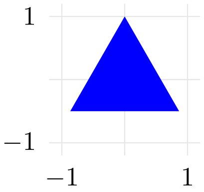
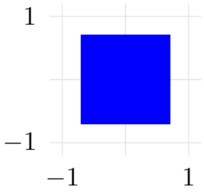
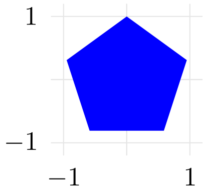
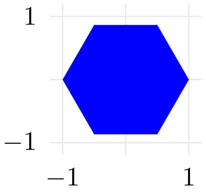
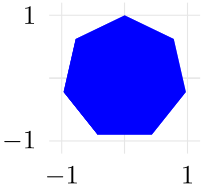
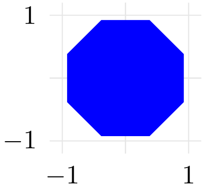
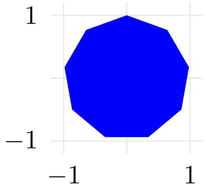
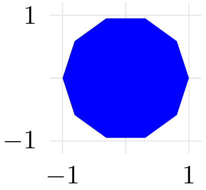
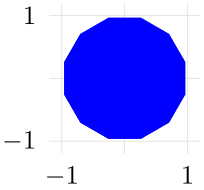
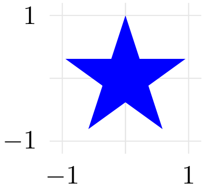
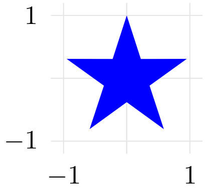
<td>
</td>
</tr>
<tr>
<td>[PolyIntermediatePoint=0.5]
\pscircle{0.5}</td>
<td>[PolyIntermediatePoint=1.5]
\pscircle{.5}</td>
<td>[PolyIntermediatePoint=-0.5]
\pscircle{.5}</td>
</tr>
</table>

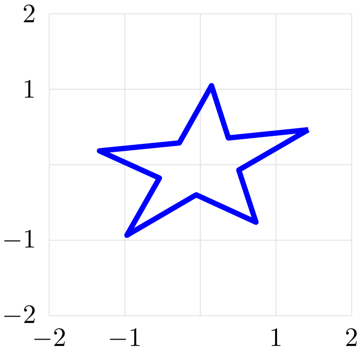
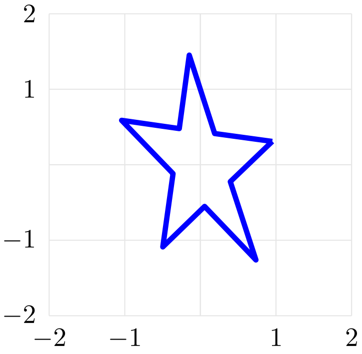
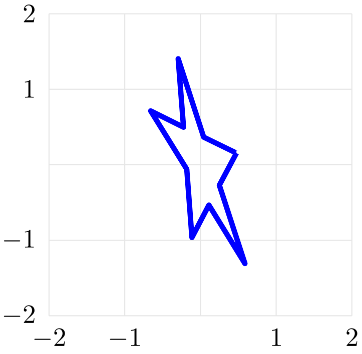
\PstPolygon[PolyOffset=2,PolyNbSides=40,PolyEpicycloid=true]		
		
PolyOffset=2	PolyOffset=3	PolyOffset=4
		
PolyOffset=5	PolyOffset=40	PolyOffset=41

\PstPolygon[unit=1,PolyName=A,PolyNbSides=6] \PstPolygon[unit=2,PolyName=B,PolyNbSides=6]	
	
\psline(A1)(B1)	\psline(A2)(B5)

5.2 Polygones prédéfinis

			
\PstTriangle	**\PstSquare**	**\PstPentagon**	**\PstHexagon**
			
\PstHeptagon	**\PstOctogon**	**\PstNonagon**	**\PstDecagon**
			
\PstDodecagon	**\PstStarFiveLines**	**\PstStarFive**	

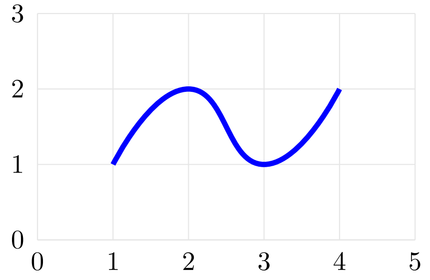
			
\PstTriangle*	**\PstSquare***	**\PstPentagon***	**\PstHexagon***
			
\PstHeptagon*	**\PstOctogon***	**\PstNonagon***	**\PstDecagon***
			
\PstDodecagon*	**\PstStarFiveLines***	**\PstStarFive***	

\PstStarFive[xunit=1.5]		
		
xunit=1.5	yunit=1.5	xunit=0.5,yunit=1.5

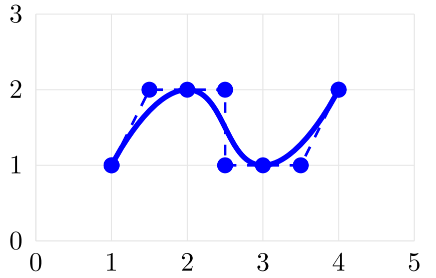
6 Courbes de Bezier

utilisation du module « **pst-bezier** »

6.1 Commande psbcurve

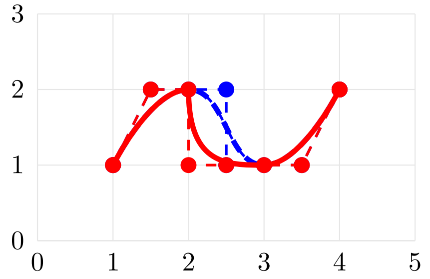


psbcurve(1,1)(2,2)(3,1)(4,2)

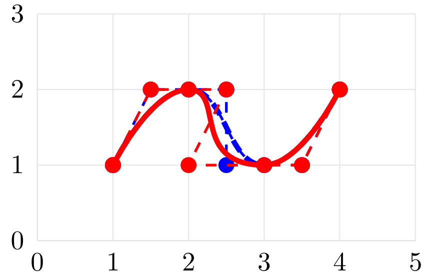


\psbcurve[showpoints=true](1,1)(2,2)(3,1)(4,2)

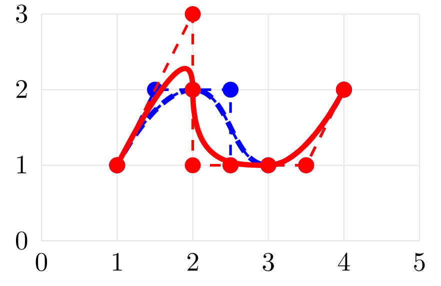
6.2 Modificateurs



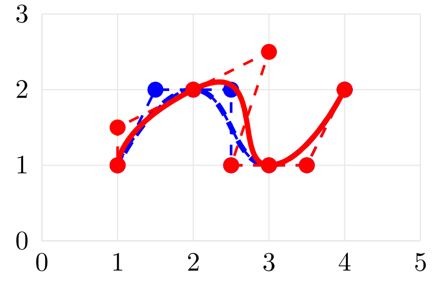
\psbcurve(1,1)(2,2)l(2,1)(3,1)(4,2)



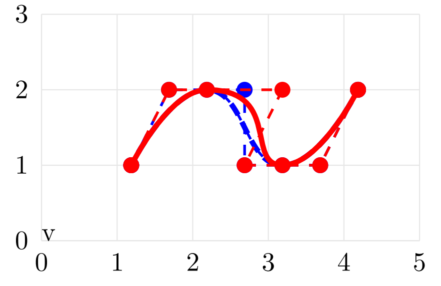
\psbcurve(1,1)(2,2)r(2,1)(3,1)(4,2)



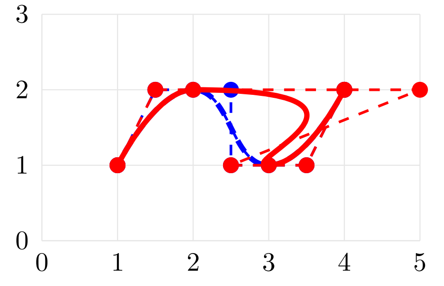
`\psbcurve(1,1)(2,2)L(2,1)(3,1)(4,2)`



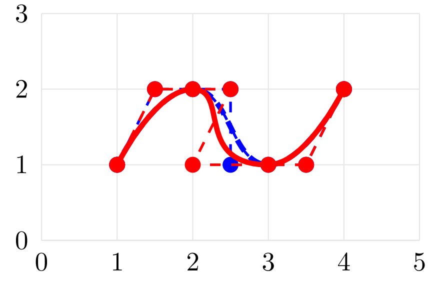
`\psbcurve(1,1)(2,2)L(3,2.5)(3,1)(4,2)`



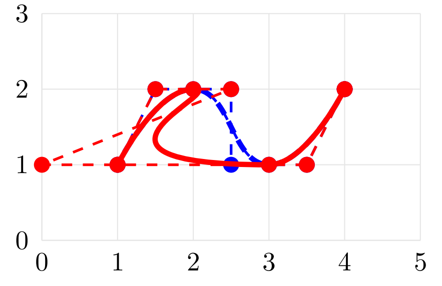
`\psbcurve(1,1)(2,2)tl{0.5} (3,1)(4,2)`



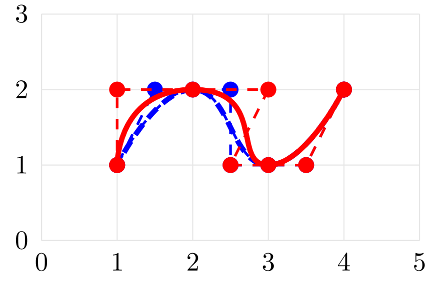
`\psbcurve(1,1)(2,2)tl{1.5} (3,1)(4,2)`



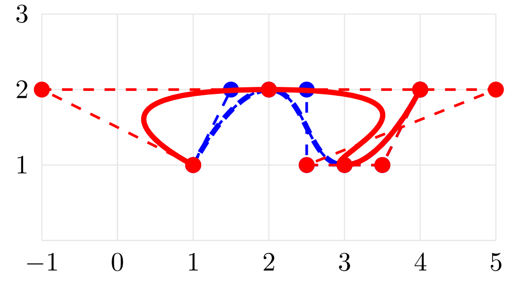
`\psbcurve(1,1)(2,2)tr{0.5} (3,1)(4,2)`



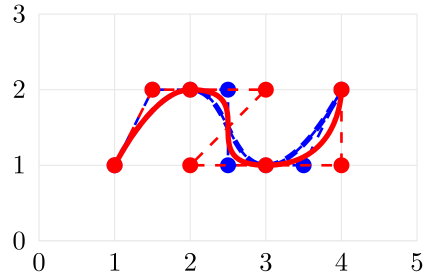
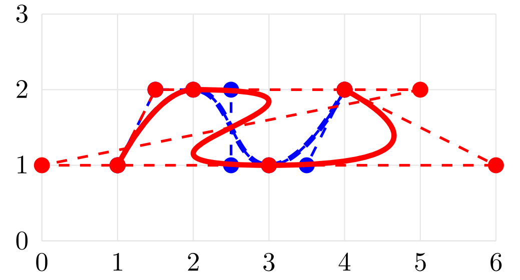
`\psbcurve(1,1)(2,2)tr{1.5} (3,1)(4,2)`

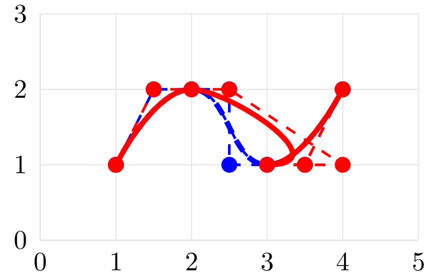
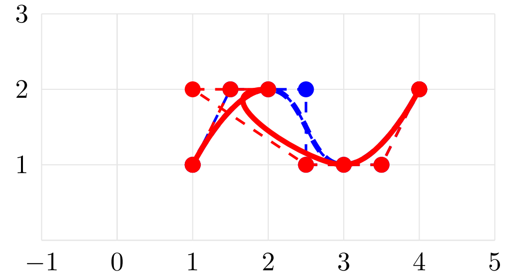
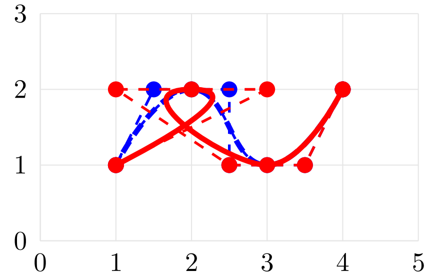


`\psbcurve(1,1)(2,2)ts{0.5} (3,1)(4,2)`

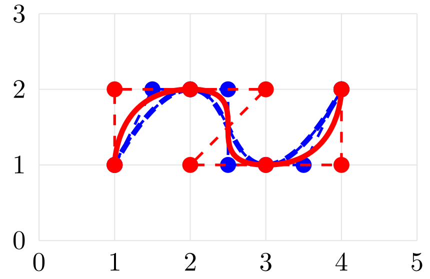
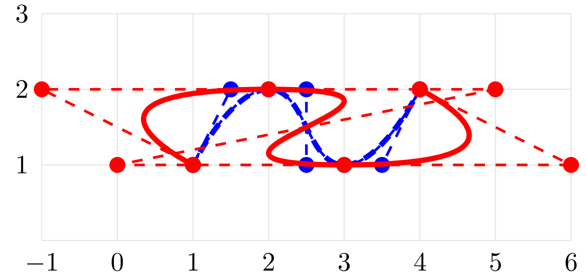


`\psbcurve(1,1)(2,2)ts{1.5} (3,1)(4,2)`

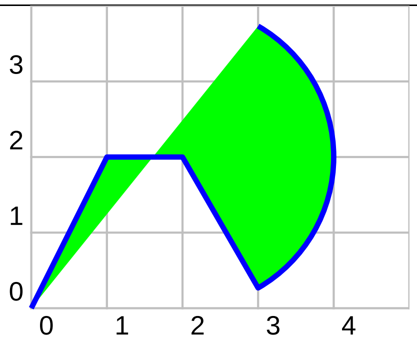
	
\psbcurve(1,1)(2,2)T{0.5} (3,1)(4,2)	\psbcurve(1,1)(2,2)T{1.5} (3,1)(4,2)

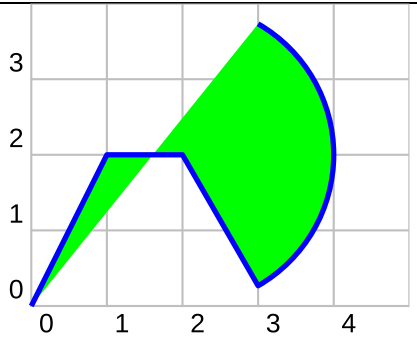
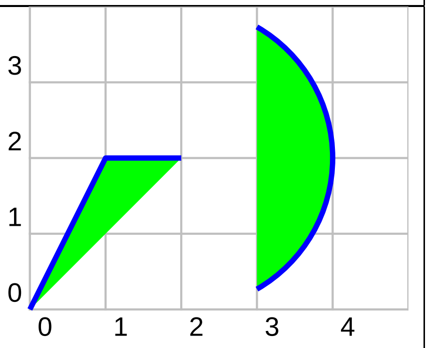
	
\psbcurve(1,1)(2,2)tr{-0.5} (3,1)(4,2)	\psbcurve(1,1)(2,2)tl{-0.5} (3,1)(4,2)
	
\psbcurve(1,1)(2,2)ts{-0.5} (3,1)(4,2)	

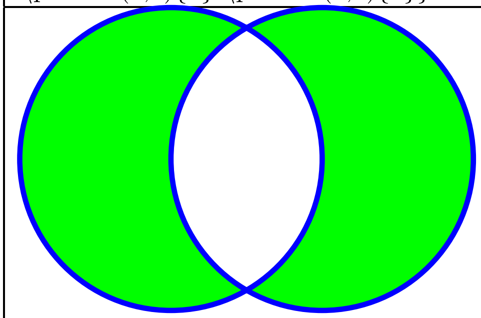
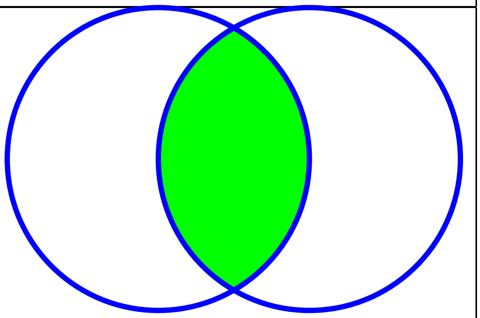
6.3 Paramètre bcurveTension

\psbcurve[bcurveTension=1.5,linecolor=red](1,1)(2,2)ts{0.5} (3,1)(4,2)	
	
bcurveTension=0.5	bcurveTension=1.5

7 Notion de chemin PSTricks

	**\pscustom**[linecolor=blue]{
	\psline[linecolor=red](0,0)(1,2)
	\psarc[linestyle=dashed](2,2){2}{-60}{60}
	\fill[fillstyle=solid,fillcolor=green]
	}

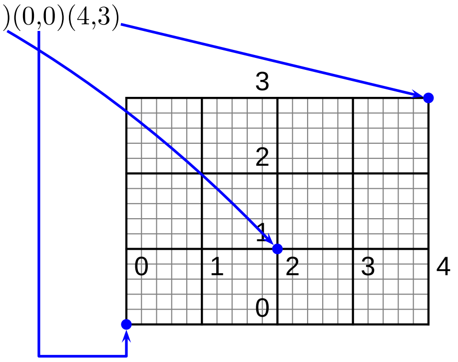
\pscustom { \psline(0,0)(1,2)(2,2) \psarc[liftpen=1](2,2){2}{-60}{60} \fill[fillstyle=solid,fillcolor=green] }	
	
liftpen=1	liftpen=2

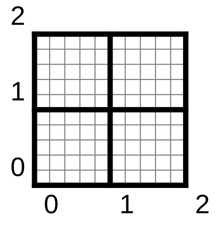
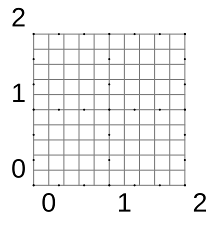
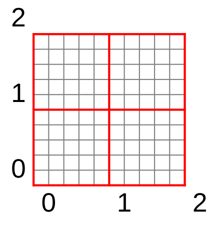
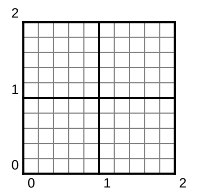
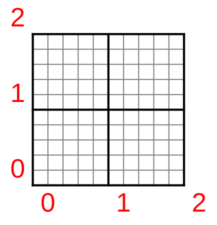
\pscustom[fillstyle=eofill,fillcolor=green]{ \pscircle(2,2){2} \pscircle(4,2){2}}	
	
fillstyle= eofill	fillstyle= oefill

8 Les coordonnées

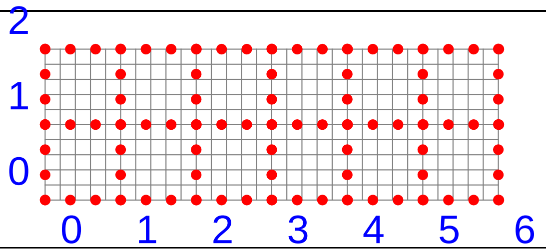
8.1 Quadrillage avec psgrid

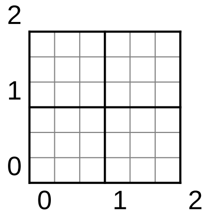
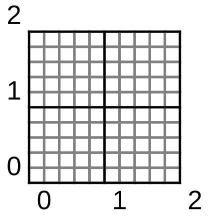
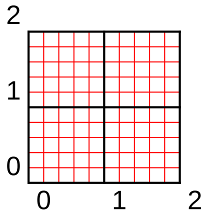
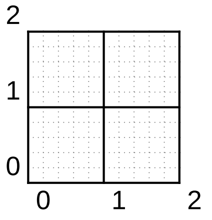
\psgrid(2,1)(0,0)(4,3)

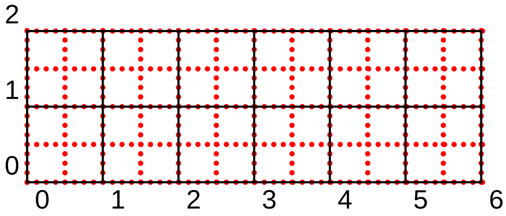


Quadrillage principal				
				
gridwidth= 2pt	griddots=3	gridcolor=red	gridlabels=5pt	gridlabelcolor=red
Par défaut : .8pt	Par défaut : 0	Par défaut : black	Par défaut : 10pt	Par défaut : black

Exemple :


\psgrid[gridwidth=4pt,gridcolor=red,griddots=3,gridlabelcolor=blue,gridlabels=15pt](6,2)

Quadrillage secondaire			
			
subgriddiv=3	subgridwidth=1pt	subgridcolor=red	subgriddots=3
Par défaut : 5	Par défaut : .4pt	Par défaut : gray	Par défaut : 0



\psgrid[subgriddiv=2,subgridwidth=1pt,subgridcolor=red,subgriddots=3](6,3)

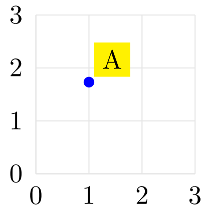
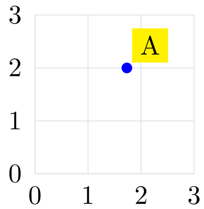
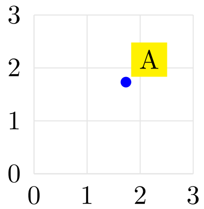
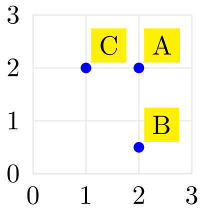
8.2 Systèmes de coordonnées

8.2.1 Par défaut

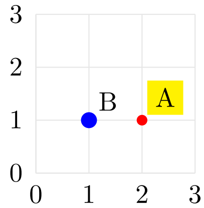
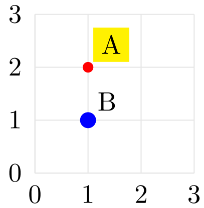
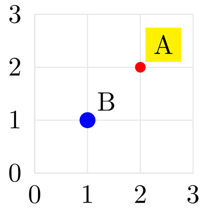
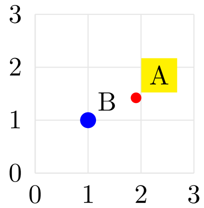
coordonnées cartésiennes : (x,y) . (l'origine est la position actuelle)

8.2.2 Autres systèmes de coordonnées

- Activation avec la commande **\SpecialCoor**
- Désactivation par la commande **\NormalCoor**

\dotnode*[dotstyle=*](2;60){A} \nput*{45}{A}{A}			
polaire	calculé [1]	(coor1|coor2)	(coor1|coor2)
			
(2 ;60)	(!3 sqrt 2)	(2 ;30|2 ;60)	(B|C)

8.2.3 Position relative

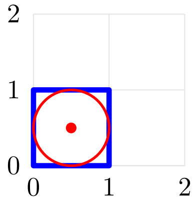
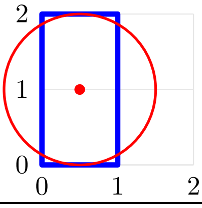
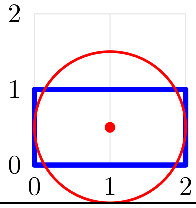
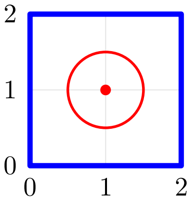
\dotnode*[dotstyle=*,linecolor=red]([nodesep=1]B){A} \nput*{45}{A}{A}			
			
([nodesep=1]B)	([offset=1]B)A	([nodesep=1,offset=1]B)	([angle=25,nodesep=1]B)

---

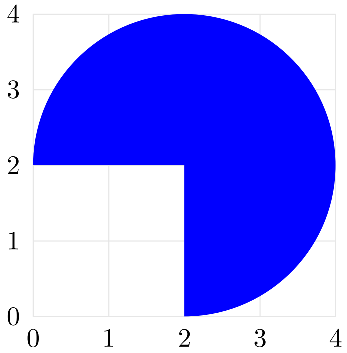
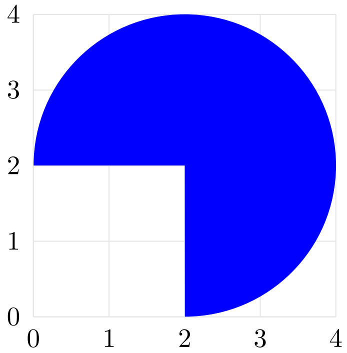
[1] formule de calcul en langage PostScript (voir 240)

8.3 Modification des unités par défaut

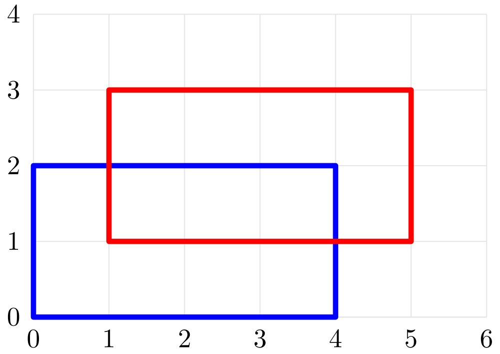
8.3.1 Modification des unités des longueurs

<table>
<tr><td colspan="4">**\psset**{unit=0.5cm} \psframe(2,2) \psdots(1,1) \pscircle(1,1){1}</td></tr>
<tr>
<td> </td>
<td> </td>
<td> </td>
<td> </td>
</tr>
<tr><td>unit= 0.5cm</td><td>xunit= 0.5cm</td><td>yunit= 0.5cm</td><td>runit= 0.5cm</td></tr>
<tr><td colspan="4">Par défaut : unit= xunit = yunit = runit = 1cm</td></tr>
</table>

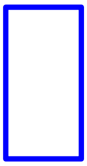
8.3.2 Modification de l'unité des angles

<table>
<tr><td>angle en pourcentage</td><td>angles en radians</td></tr>
<tr>
<td> </td>
<td> </td>
</tr>
<tr><td>**\degrees**[1]
\pswedge*(0,0)2{-0.25}{0.50}</td><td>**\radians**
\pswedge*(0,0)2{1.57}{\psPi}</td></tr>
</table>

8.4 Changement d'origine

<table>
<tr>
<td> </td>
<td>\psframe[linewidth=2pt](4,2)
\psframe[linewidth=2pt,linecolor=red,
origin={1,1}](4,2)</td>
</tr>
</table>

8.5 Permutation des axes

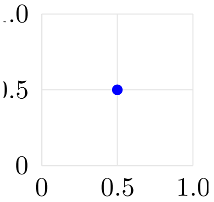
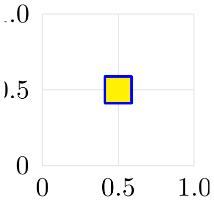
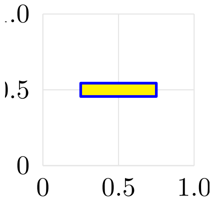
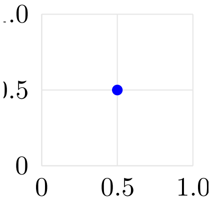
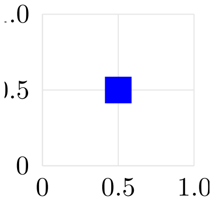
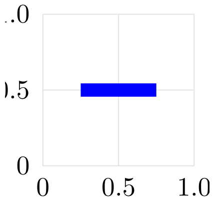
\psset{swapaxes=true} \psframe(2,1)	
	
\psset{swapaxes=true}	\psset{swapaxes=false} (Par défaut)

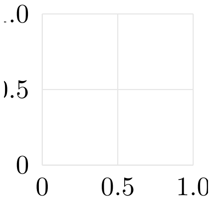
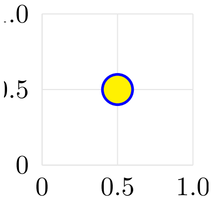
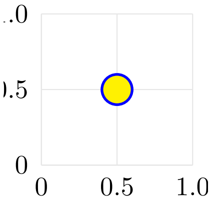
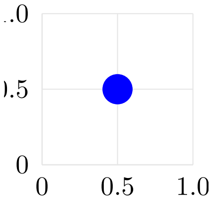
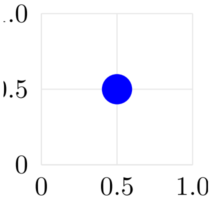
9 Les nœuds

Utilisation du module **pst-node**

9.1 Les types de nœuds

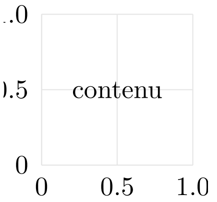
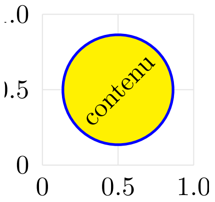
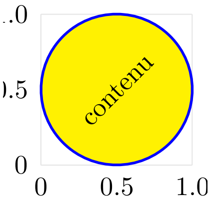
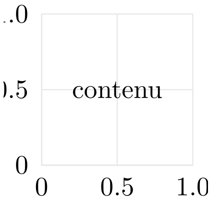
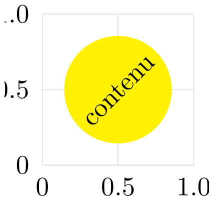
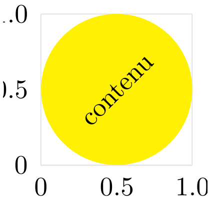
9.1.1 Avec coordonnées[1]

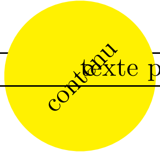
		
dotnode(.5,0.5){A}	**fnode**(.5,0.5){B}	**fnode**[framesize=.5 5pt](.5,0.5){B}
		
dotnode*(.5,0.5){A}	**fnode***(.5,0.5){B}	**fnode***[framesize=.5 5pt](.5,0.5){B}

		
pnode(.5,0.5){A}	**cnode**(.5,0.5){.2cm}{A}	**Cnode**[radius=.2cm](.5,0.5){A}
		
	cnode*(.5,0.5){.2cm}{A}	**Cnode***[radius=.2cm](.5,0.5){A}

---

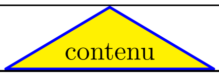
[1] fillcolor=yellow,linecolor=blue

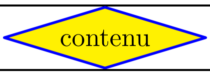
		
psnode(.5,0.5){A}{contenu}	**cnodeput**{45}(.5,0.5) {M}{contenu}	**Cnodeput**[radius=1cm] {45}(2,0){M}{contenu}
		
psnode*(.5,0.5){A}{contenu}	**cnodeput***{45}(.5,0.5) {M}{contenu}	**Cnodeput***[radius=1cm] {45}(2,0){M}{contenu}

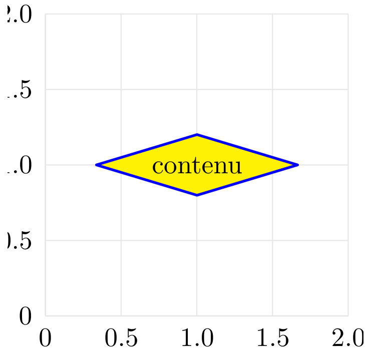
Texte  texte près
Texte avant \Cnodeput*[radius=1cm]{45}(0,0){M}{contenu} texte près Ces nœuds n'ont pas de dimension !

9.2 Sans coordonnées

contenu	contenu	contenu
rnode{A}{contenu}	**Rnode**{B}{contenu}	**rnode**{C}{\psframebox{contenu}}
	contenu	contenu
	Rnode*{B}{contenu}	**rnode**{C}{\psframebox*{contenu}}

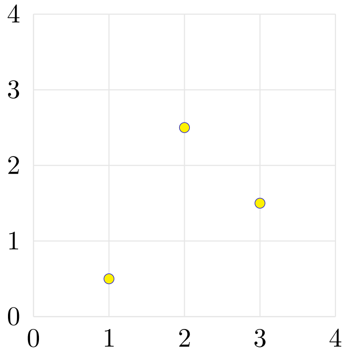
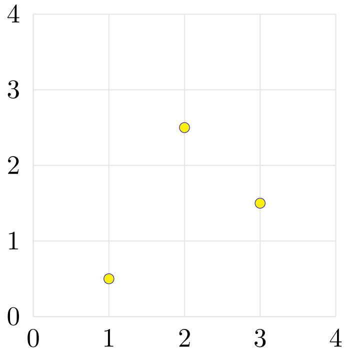
	
trinode{A}{contenu}	**trinode***{B}{contenu}

Texte avant  texte près
Texte avant \dianode{A}{contenu} texte près



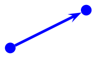
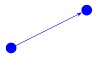
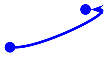
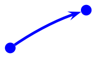
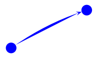
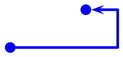
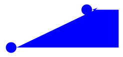
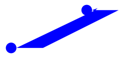
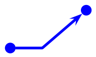
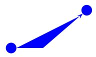
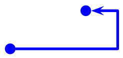
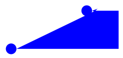
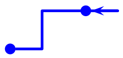
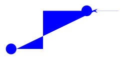
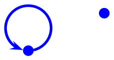
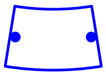
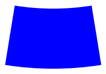
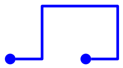
\rput(1,1){\dianode{A}{contenu}}

9.2.1 Création de nœuds multiples

\dotnodes[dotstyle=o](1, 0.5){A}(2, 2.5){B}(3, 1.5){C}	
	
\dotnodes	\dotnodes*

9.3 Les connexions entre les nœuds

9.3.1 Les types de connexions disponibles[2]

	sans astérisque	**avec astérisque**
\ncline{->}{A}{B}		
\nccurve{->}{A}{B}		
\ncarc{->}{A}{B}		
\ncbar{->}{A}{B}		
\ncdiag{->}{A}{B}		
\ncdiagg{->}{A}{B}		
\ncangle{->}{A}{B}		
\ncangles{->}{A}{B}		
\nccircle{->}{A}{.3cm}		
\ncbox{->}{A}{B}	boxsize	
\ncarcbox{->}{A}{B}		
\ncloop{->}{A}{B}		

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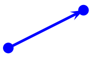
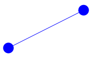
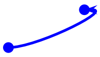
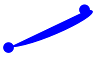
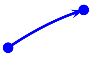
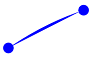
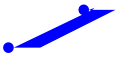
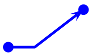
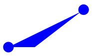
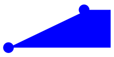
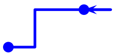
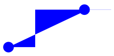
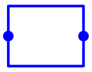
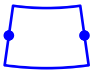
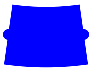
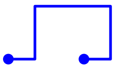
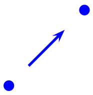
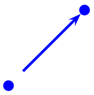
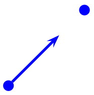
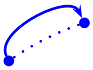
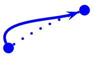
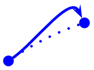
[2] fillcolor=white,linecolor=blue

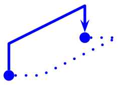
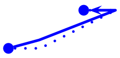
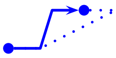
9.3.2 Les noeuds comme des points de dessin

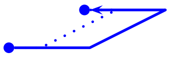
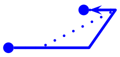
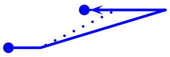
	sans astérisque	**avec astérisque**
\pcline{->}(A)(B)		
\pccurve{->}(A)(B)		
\pcarc {->}(A)(B)		
\pcbar{->}(A)(B)		
\pcdiag{->}(A)(B)		
\pcdiagg {->}(A)(B)		
\pcangle{->}(A)(B)		
\pcangles{->}(A)(B)		
\pcbox{->}(A)(B)		
\pcarcbox{->}(A)(B)		
\pcloop {->}(A)(B)		

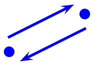
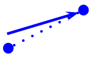
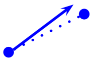
9.3.3 Les options disponibles

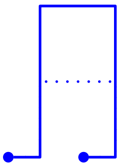
\ncline[nodesep=.3cm]{->}{A}{B}		
		
nodesep=0.3cm	nodesepA=0.2cm	nodesepB=0.4cm
Par défaut : 0pt	Par défaut : 0pt	Par défaut : 0pt

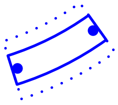
\ncarc[arcangle=90]{->}{A}{B}		
		
arcangle=90	arcangleA=90	arcangleB=90
Par défaut : 8	Par défaut : 8	Par défaut : 8
seulement pour \ncarc!		

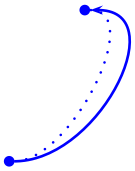
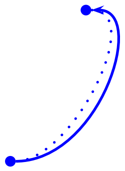
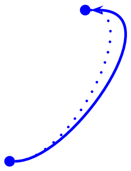
\ncdiag[angle=90]{->}{A}{B}		
		
angle=90	angleA=15	angleB=180
Par défaut : 0	Par défaut : 0	Par défaut : 0

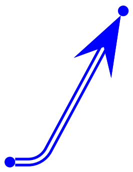
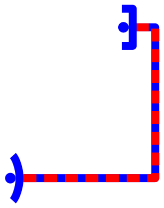
\ncdiag[arm=1cm]{->}{A}{B}		
		
arm=1cm	armA=1cm	armB=1cm
Par défaut : 10pt	Par défaut : 10pt	Par défaut : 10pt

		
\ncline[offset=5pt]{->}{A}{B} \ncline[offset=5pt]{->}{B}{A}	\ncline[offsetA=5pt]{->}{A}{B} \ncline[linestyle=dotted]{A}{B}	\ncline[offsetB=5pt]{->}{A}{B} \ncline[linestyle=dotted]{A}{B}
Par défaut : 0pt	Par défaut : 0pt	Par défaut : 0pt


\ncloop[loopsize=2cm]{A}{B}
Par défaut : 1 cm

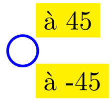
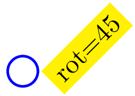

\ncarcbox[boxsize=.2]{A}{B}
Par défaut : 0.4cm
seulement pour \ncbox et \ncarcbox!

		
\nccurve[ncurv=1]{->}{A}{B}	\nccurve[ncurvA=1]{->}{A}{B}	\nccurve[ncurvB=1]{->}{A}{B}
Par défaut : 0.67	Par défaut : 0.67	Par défaut : 0.67
seulement pour \nccurve et \pccurve!		

personnalisation des liaisons	
	
\ncdiagg[linearc=.3cm,doubleline=true, arrowscale=2]{->}{A}{B}	\ncbar[linestyle=dashed,linewidth=3pt, dashcolor=red]{)-[}{A}{B}

9.4 Les étiquettes

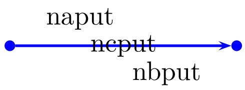
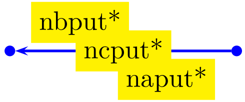
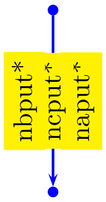
9.4.1 Les étiquettes sur les nœuds[3]

syntaxe : \nput*[paramètres]{position=angle}{nom}{texte}		
\nput		`\nput{0}{A}{texte}`
\nput*		`\nput*{0}{A}{texte}`
position=angle		`\nput*{45}{A}{à 45}`
labelsep		`\nput*[labelsep=0.5cm]{0}{A}{texte}`
labelsep		`\nput*[labelsep=-0.1cm]{0}{A}{texte}`
rot		`\nput*[rot=45]{0}{A}{rot=45}`

---

[3] fillcolor=yellow,linecolor=blue

9.4.2 Les étiquettes sur les connexions

naput ncput nbput		\ncline{->}{A}{B}**\naput**[npos=.3]{naput} \ncline{->}{A}{B}**\ncput**{ncput} \ncline{->}{A}{B}**\nbput**[npos=.7]{nbput}
naput* ncput* nbput*		\ncline{->}{B}{A}\naput*[npos=.3]{naput} \ncline{->}{B}{A}\ncput*{ncput} \ncline{->}{B}{A}\nbput*[npos=.7]{nbput}
[nrot=90]		\ncline{->}{B}{A}\naput*[nrot=90]{naput} \ncline{->}{B}{A}\naput*[nrot=90]{naput} \ncline{->}{B}{A}\nbput*[nrot=90]{nbput}

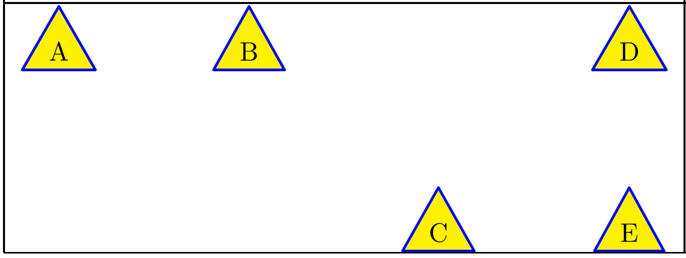
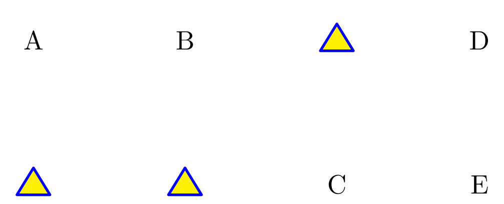
9.5 Les Matrices de nœuds

9.5.1 Création de la matrice de noeuds

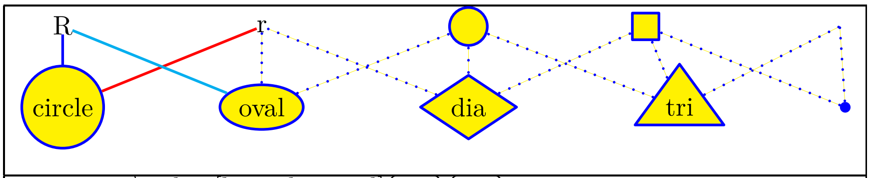
A B C D	**\psmatrix** A & B \\ C & D \\ **\endpsmatrix**

9.5.2 Les 10 types de noeuds

R	r	○	□	
[mnode= R] R	[mnode= r] r	[mnode= C] C	[mnode= f] f	[mnode= p] p
circle	oval	dia	tri	●
[mnode= circle] circle	[mnode= oval] oval	[mnode=dia] dia	[mnode= tri] tri	[mnode= dot] dot

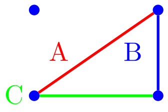
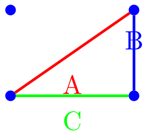
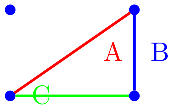
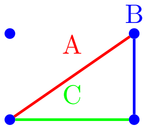
\psmatrix[mnode=tri] A & B & & D \\ & & C & E \\ \endpsmatrix	\psmatrix[emnode=tri] A & B & & D \\ & & C & E \\ \endpsmatrix
	

9.5.3 Liaison des noeuds

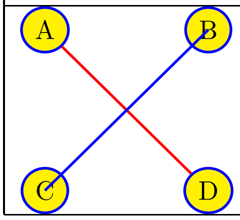


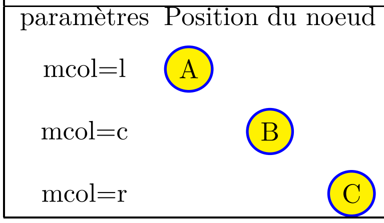
```
\ncline[linecolor=red]{1,2}{2,1}
\ncline[linecolor=blue]{1,1}{2,1}
\ncline[linecolor=cyan]{1,1}{2,2}
```

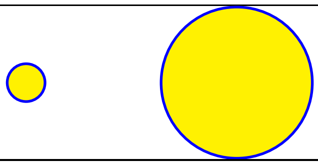
9.5.4 Étiquettes sur les liaisons

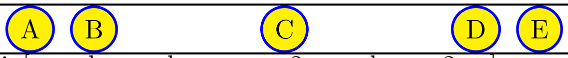
			
\ncline{1,2}{2,1}<{A} \ncline{1,2}{2,2}<{B} \ncline{2,1}{2,2}<{C}	\ncline{1,2}{2,1}_{A} \ncline{1,2}{2,2}_{B} \ncline{2,1}{2,2}_{C}	\ncline{1,2}{2,1}>{A} \ncline{1,2}{2,2}>{B} \ncline{2,1}{2,2}>{C}	\ncline{1,2}{2,1}^{A} \ncline{1,2}{2,2}^{B} \ncline{2,1}{2,2}^{C}

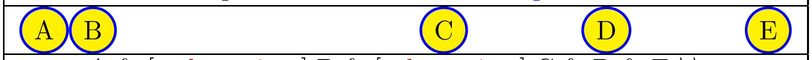
9.5.5 Les autres paramètres

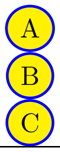
name	
	\psmatrix[mnode= oval] [name=A] A & [name=B] B \\ [name=C] C & [name=D] D \\ \endpsmatrix \ncline[linecolor=red]{A}{D} \pcline[linecolor=blue](B)(C)

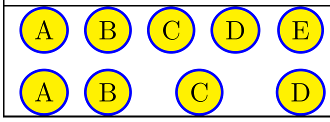
mcol	Par défaut : mcol=c
	\psmatrix[rowsep=.2cm,colsep=.2cm] paramètres & Position du noeud \\ mcol=l & [mnode= oval,mcol=l] A \\ mcol=c & [mnode= oval,mcol=c] B \\ mcol=r & [mnode= oval,mcol=r] C \\ \endpsmatrix

radius

\psmatrix [mnode=C] & [mnode=C, radius=1cm] \endpsmatrix

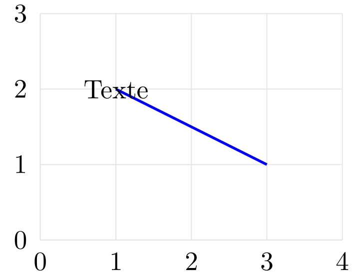
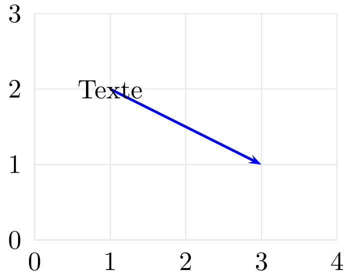
mnodesize	Par défaut : mnodesize= -1pt
	
\psmatrix[mnode=oval,rowsep=.2cm,colsep=.2cm] A & B & [mnodesize=4cm] C & D & E \endpsmatrix	

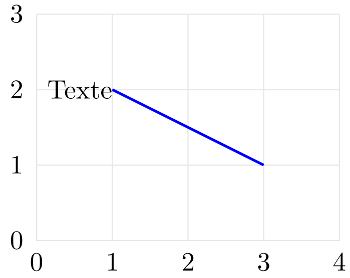
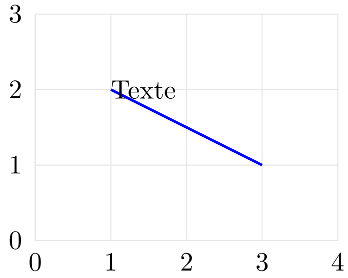
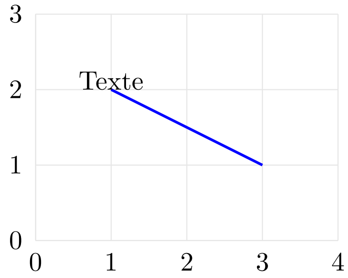
colsep Par défaut : colsep= 1.5cm

A & [colsep=0cm] B & [colsep=4cm] C & D & E \\

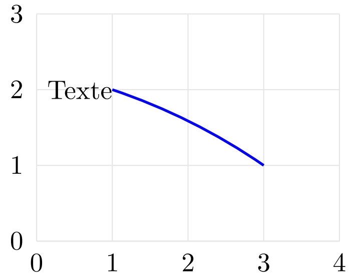
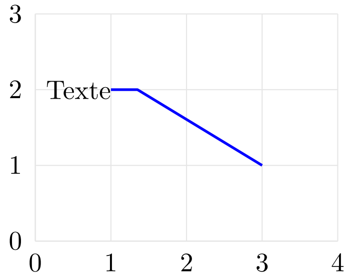
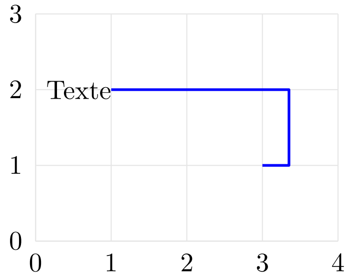
rowsep Par défaut : rowsep= 1.5cm		
		
rowsep=0cm	rowsep=1cm	Par défaut

\psspan	
	A & B & C & D & E \ \ A & B & C \psspan{2} & D \ \

9.6 Commenter un élément

	
\psComment(1,2)(3,1){Texte}	**\psComment**{->} (1,2)(3,1){Texte}

\psComment[ref=r] (1,2)(3,1){Texte}		
		
[ref=r]	[ref=l]	[ref=B]

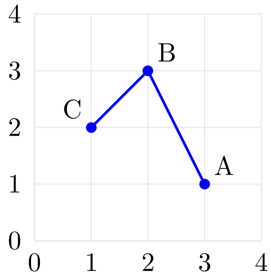
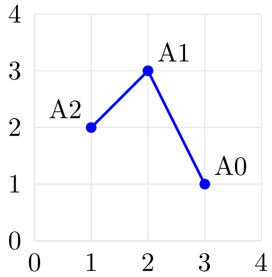
\psComment[ref=r](1,2)(3,1){Texte}[\ncarc]		
		
[\ncarc]	[\ncdiagg]	[\ncbar]

A voir : problème avec le deuxième paramètre final [\ncput]

10 Constructions particulières

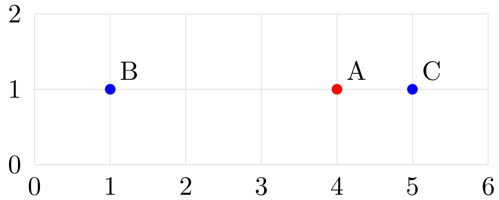
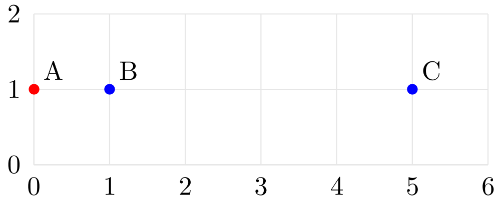
Voir aussi le module de géométrie page 180

10.1 Création de nœuds multiples

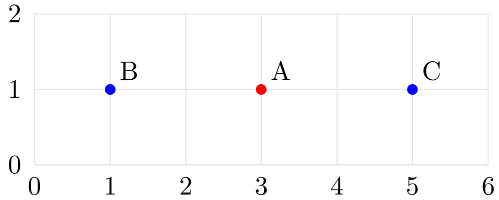
	
\pnodes(3,1){A}(2,3){B} (1,2){C} \psline (A) (B) (C)	**\pnodes**{A} (3,1)(2,3) (1,2) \psline (A0) (A1) (A2)

10.2 Positionement calculé de nœuds

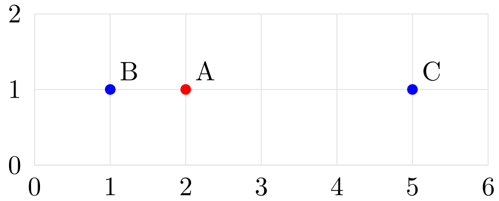
10.2.1 Positions relatives avec psLNode

	
\psLNode(B)(C){0.75}{A}	**\psLNode**(B)(C){-0.25}{A}

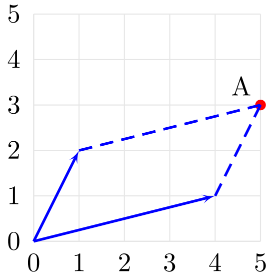
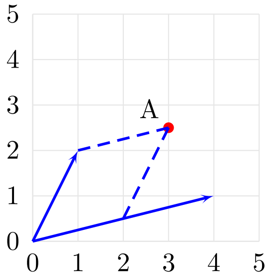
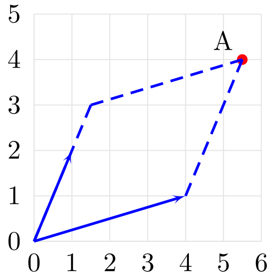
10.2.2 Positions relatives avec midAB


\midAB(B)(C){A}

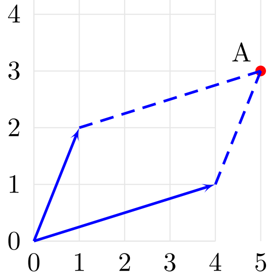
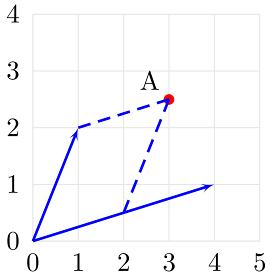
10.2.3 Positions avec psLDNode


\psLDNode(B)(C){1cm}{A}

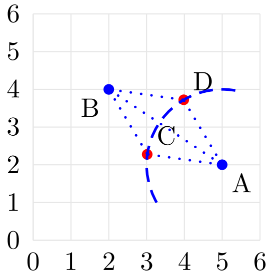
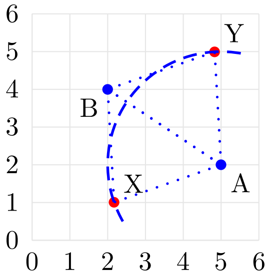
10.2.4 Positions relatives avec psLCNode

		
\psLCNode(4,1){1}(1,2){1}{A}	**\psLCNode**(4,1){.5}(1,2){1}{A}	**\psLCNode**(4,1){1}(1,2){1.5}{A}

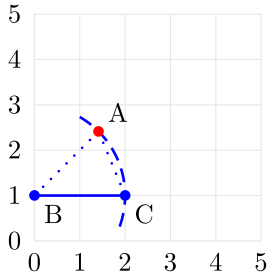
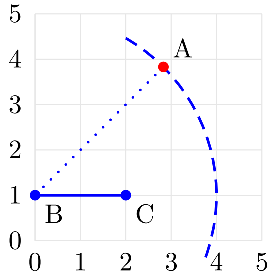
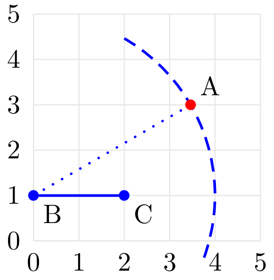
10.2.5 Positions relatives avec psLCNodeVar

	
\psLCNodeVar(4,1)(1,2)(1,1){A}	**\psLCNodeVar**(4,1)(1,2)(0.5,1){A}

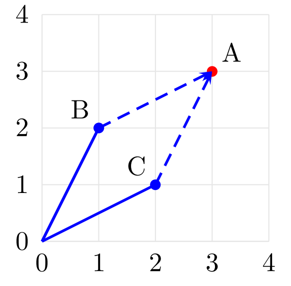
10.2.6 Positions relatives avec rhombus

	
\rhombus{2}(A)(B){C}{D}	**\rhombus**{3}(A)(B){X}{Y}

10.2.7 Positions relatives avec psRelNodeVar

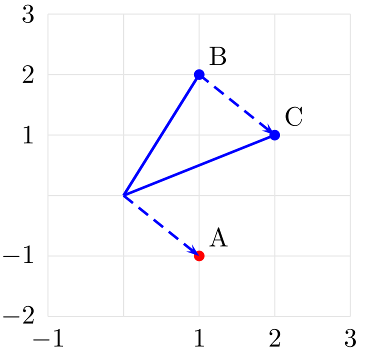
		
\psRelNodeVar(B)(C)(1;45){A}	**\psRelNodeVar**(B)(C)(2;45){A}	**\psRelNodeVar**(B)(C)(2;30){A}

10.2.8 Positions relatives avec AplusB



```
\AplusB(B)(C){A}
```

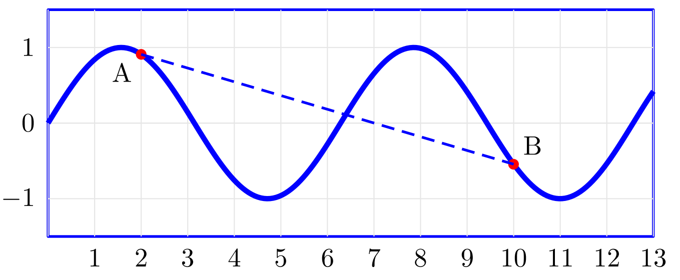
10.2.9 Positions relatives avec AtoB



```
\AtoB(B)(C){A}
```

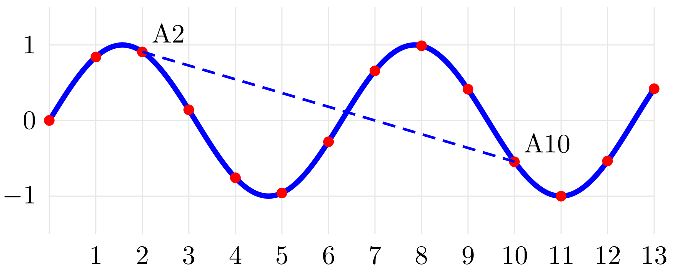
10.3 Nœud sur une courbe

10.3.1 Nœud sur une courbe avec fnpnode



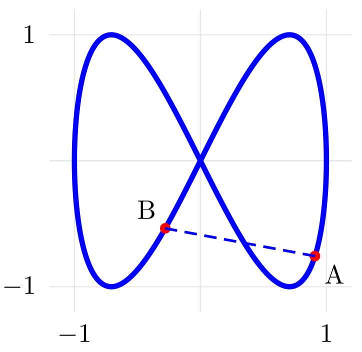
```
\psplot[plotpoints=200,linewidth=2pt]0{13}sin(x)
\fnpnode{2}{sin(x)}{A}
\fnpnode{10}{sin(x)}{B}
\psline[linestyle=dashed] (A) (B)
```

10.3.2 Nœuds sur une courbe avec fnpnodes



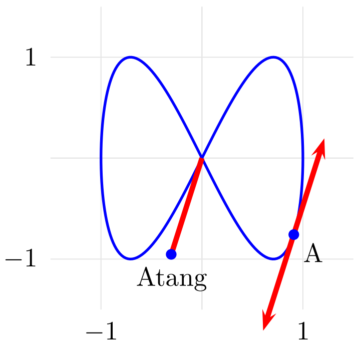
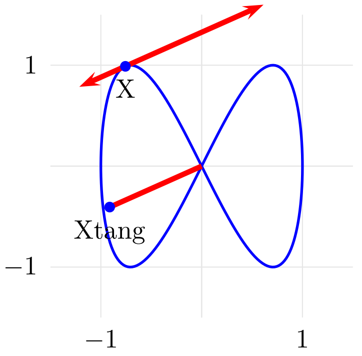
```
\psplot[plotpoints=200,linewidth=2pt]0{13}sin(x)
\fnpnodes[plotpoints=14]{0}{13}{sin(x)}{A}
\psline[linestyle=dashed] (A2) (A10)
```

10.3.3 Nœud sur une courbe paramétrique avec curvepnode

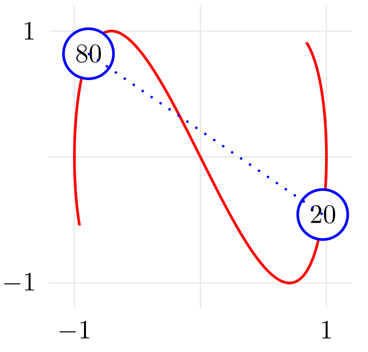
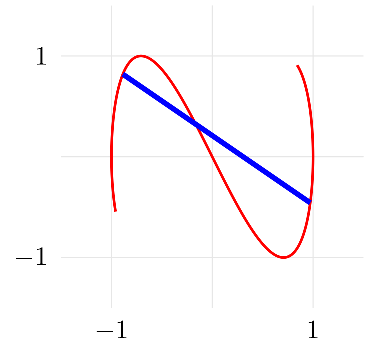


```
\parametricplot[plotpoints=200]{0}{6.28}{sin(t)|sin(2*t)}
\curvepnode{2}{sin(t)|sin(2*t)}{A}
\curvepnode{6}{sin(t)|sin(2*t)}{B}
\psline[linestyle=dashed] (A) (B)
```

Création automatique d'un nœud pour la tangente :

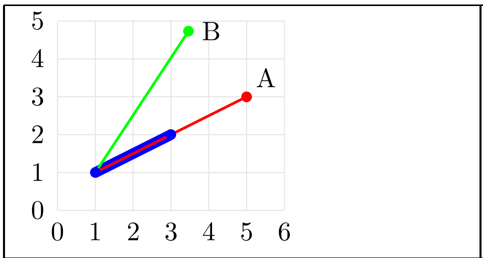
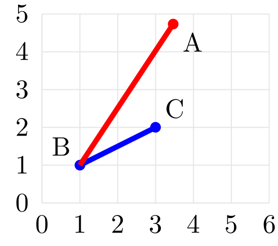
	
`\curvepnode{2}{sin(t)|sin(2*t)}{A}` `\psxline{<->}(X){-(Atang)}{(Atang)}`	`\curvepnode{4}{sin(t)|sin(2*t)}{X }` `\psxline{<->}(A){-0.5(Xtang)}{1.5(Xtang)}`

10.3.4 Nœuds sur une courbe paramétrique avec curvepnodes

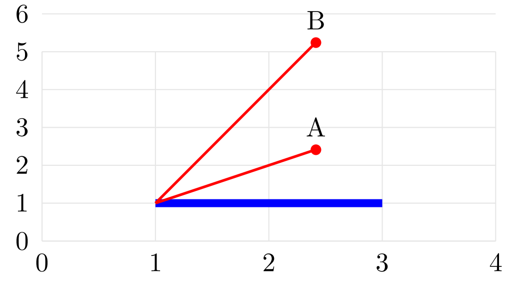
<table>
<tr><th colspan="2">**\curvepnodes**[plotpoints=100]{1}{5}{sin(t)|sin(2*t)}{A}</th></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>\cnodeput(A20){A}{20}
\cnodeput(A80){B}{80}</td><td>\psline[linewidth=2pt] (A20) (A80)</td></tr>
</table>

10.4 Lignes relatives

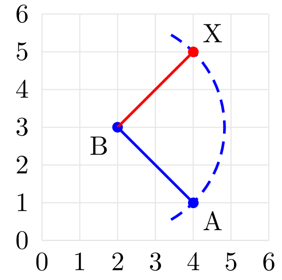
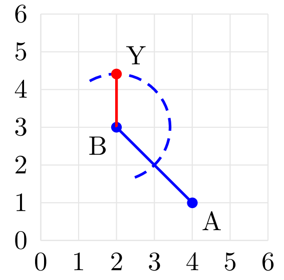
10.4.1 Lignes relatives avec psRelNode

	
\psRelLine(1,1)(3,2){2}{A} \psRelLine[angle=30](0,0)(2,1){2}{B}	**\psRelNode**[linecolor=red,angle=30](B)(C){2}{A}

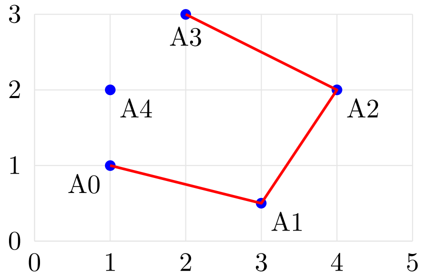
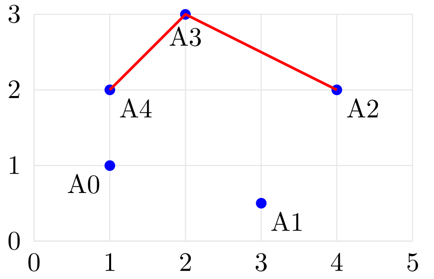
Paramètre trueAngle :


\psRelLine[angle=45](1,1)(3,1){1}{A} \psRelLine[angle=45,trueAngle](1,1)(3,1){1}{B}

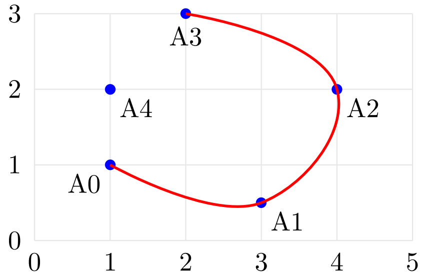
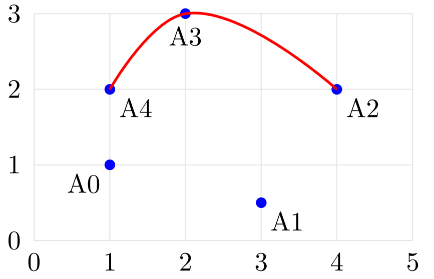
10.4.2 Lignes relatives avec psRelLineVar

	
\psRelLineVar(B)(A)(1 ;90){X}	**\psRelLineVar**(B)(A)(0.5 ;135){Y}

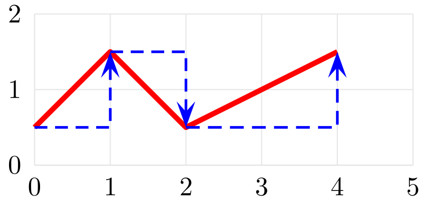
10.4.3 Ligne par une série de points avec psnline

	
\pnodes{A}(1,1)(3,0.5)(4,2)(2,3)(1,1) **\psnline**(0,3){A}	\pnodes{A}(1,1)(3,0.5)(4,2)(2,3)(1,1) **\psnline**(2,2){A}

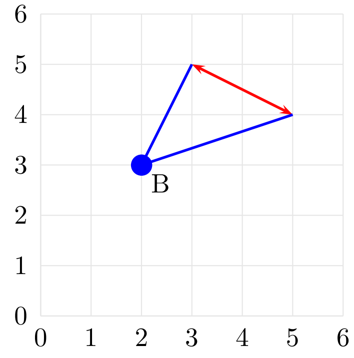
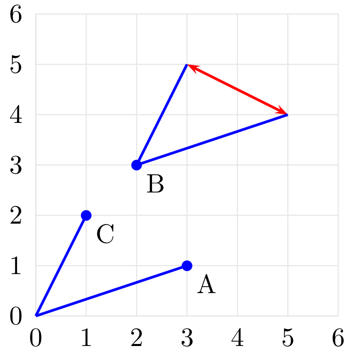
10.4.4 Courbe par une série de points avec psncurve

	
\pnodes{A}(1,1)(3,0.5)(4,2)(2,3)(1,1) **\psncurve**(0,3){A}	\pnodes{A}(1,1)(3,0.5)(4,2)(2,3)(1,1) **\psncurve**(2,2){A}

10.4.5 ligne par pas succesifs avec psrline

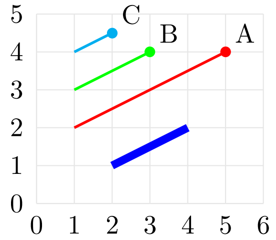

\psrline(0,0.5)(1,1)(1,-1)(2,1)

10.4.6 Lignes par rapport à un point avec psxline

	
\psxline{<->}(B){1,2}{3,1}	**\psxline**{<->}(B){A}{C}

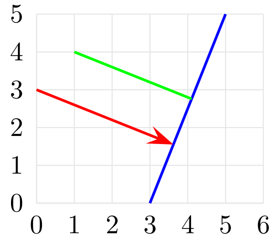
10.5 Lignes parallèles et leur noeud final

Syntaxe :
\psParallelLine(Point 1)(point 2)(point 3){longueur}{nom extrémité}



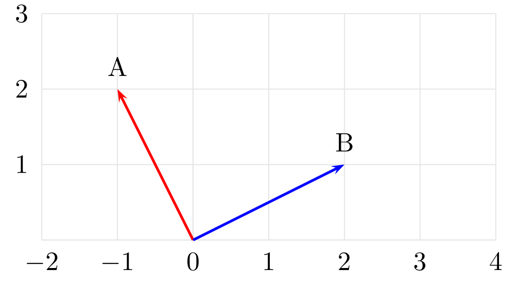
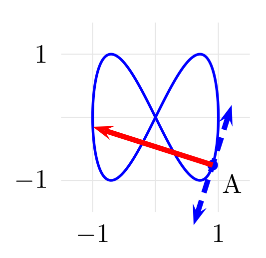
\psParallelLine(2,1)(4,2))(1,2){2}{A}
\psParallelLine(2,1)(4,2)(1,3){1}{B}
\psParallelLine(2,1)(4,2)(1,4){0.5}{C}

10.6 Lignes perpendiculaires une droite



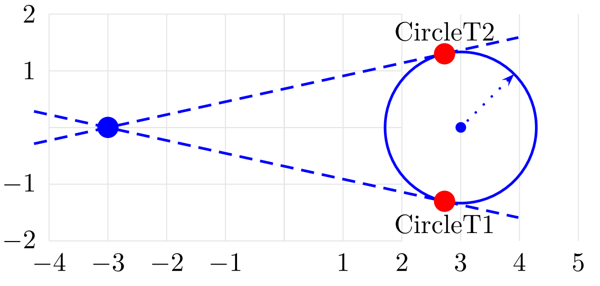
\psline(5,5)(3,0)
\psPline[linecolor=red]{->}(0,3)(5,5)(3,0)
\psPline[linecolor=green](1,4)(5,5)(3,0)

10.7 Vecteur normal

	
normalvec(B){A}	**normalvec**(Atang){B} \psxline{->}(A){} {-2(B)}

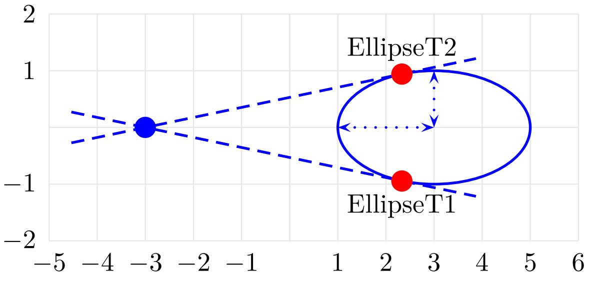
10.8 Tangentes

10.8.1 Tangentes à un cercle par rapport à un point



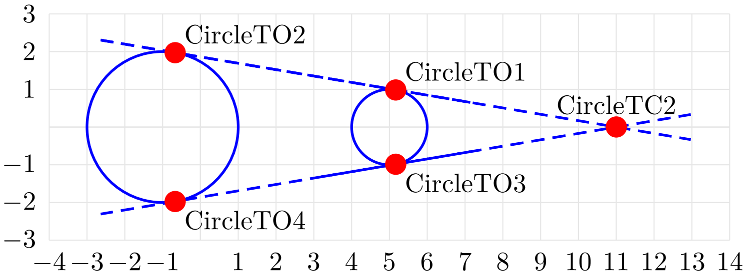
\pscircle(3,0){1}
psCircleTangents(-3,0)(3,0){1}
\pcline[nodesep=-1cm,linecolor=blue](-3,0)(CircleT1)
\nput{-90}{CircleT1}{CircleT1}

10.8.2 Tangentes à une ellipse par rapport à un point

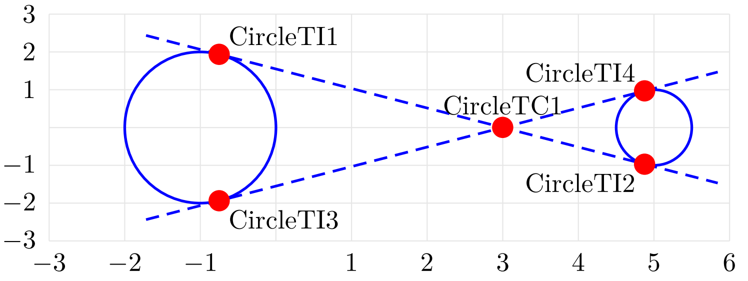


\psellipse(3,0)(2,1)
psEllipseTangents(3,0)(2,1)(-3,0)
\pcline[nodesep=-1cm](-3,0)(EllipseT1)
\nput{90}{EllipseT1}{EllipseT1}

10.8.3 Tangentes à deux cercles



```
\psCircleTangents(-1, 0){2}(5,0){1}
\psdots[dotstyle=*,linecolor=red,dotscale=2](CircleTC2)
```

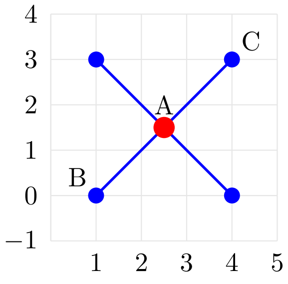


```
\psdots[dotstyle=*,linecolor=red,dotscale=2](CircleTC1)
\nput{90}{CircleTC1}{CircleTC1}
```

10.9 Intersections

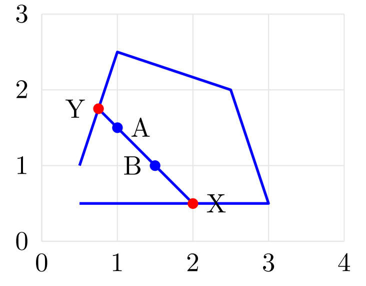
10.9.1 Point d'intersection avec psIntersectionPoint

Syntaxe :
\psIntersectionPoint(point 1)(point 2)(point 3)(point 4){nom}

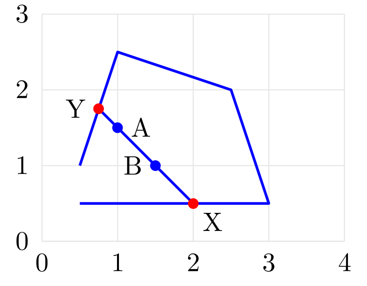


```
\psIntersectionPoint(B)(C)(1,3)(4,0){A}
```

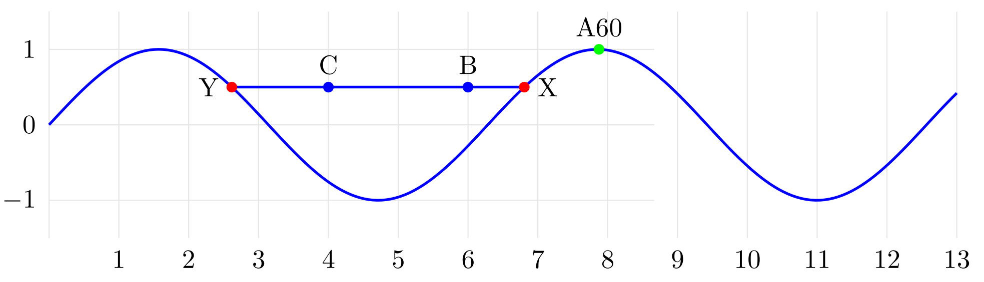
10.9.2 Points d'intersection avec polyIntersections



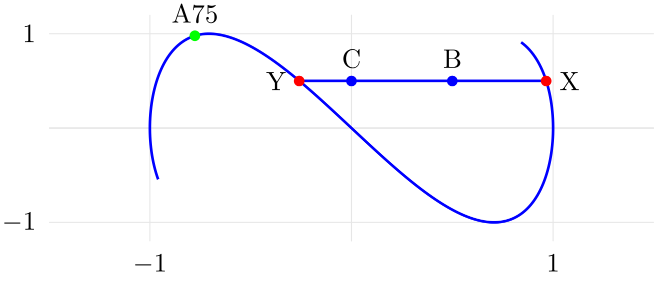
```
\polyIntersections{X}{Y}(A)(B)
  (0.5,0.5)(3,0.5)(2.5,2)(1,2.5)(0.5,1)
```



```
\pnodes{P}(0.5,.5)(3,.5)(2.5,2)(1,2.5)(.5,1)
\polyIntersections{X}{Y}(A)(B){P}{4}
```

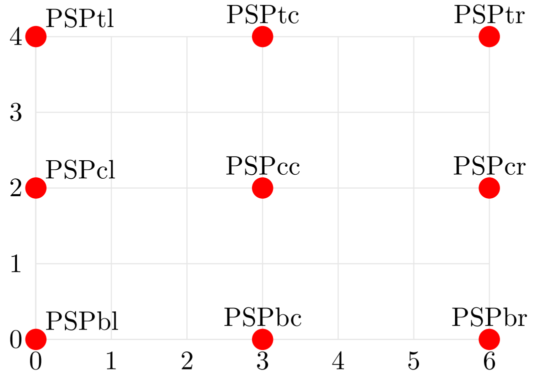


```
\fnpnodes[plotpoints=100]{0}{13}{sin(x)}{A}
\polyIntersections{X}{Y}(C)(B){A}{60}
```



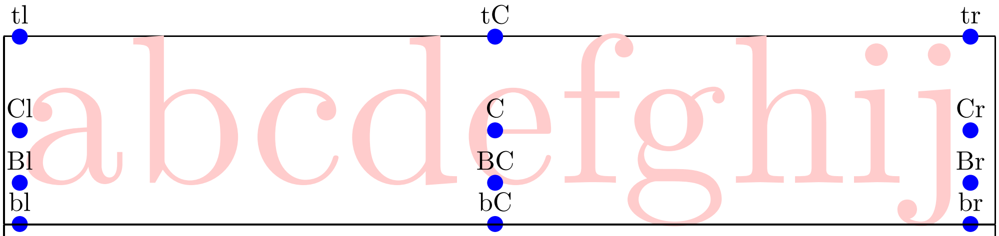
```
\curvepnodes[plotpoints=100]{1}{5}{sin(t)|sin(2*t)}{A}
\polyIntersections{X}{Y}(C)(B){A}{75}
```

10.10 Les 9 positions d'une figure par \psDefPSPNodes



```
\beginpspicture(6,4)
\psDefPSPNodes
\psdots(PSPbl)
\uput[45](PSPbl){PSPbl}
```

10.11 Nœuds sur du texte avec \psDefBoxNodes

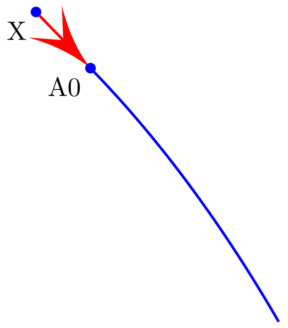
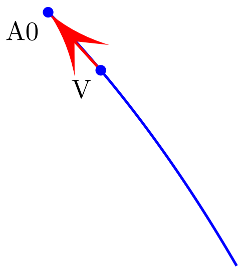
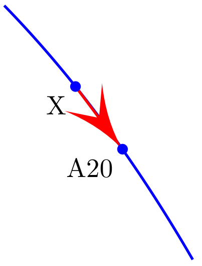
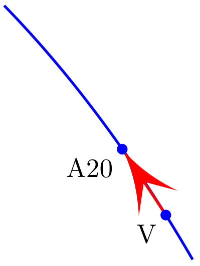


```
\psscalebox{15}{ \psDefBoxNodes{nom} { \color{red!20} abcdefghij}}
\shorthandoff{ :} [1]
\uput[90](nom:tl){tl}          \qdisk(nom:tl){3pt}
        ⋮
\shorthandon{ :}
```

---

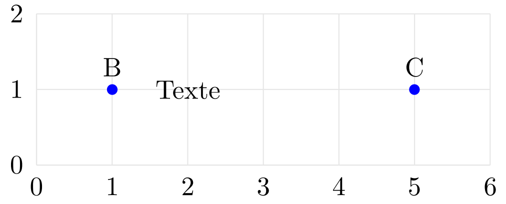
1. désactivation et ré-activation de « : »conflit entre ce module et Babel en français

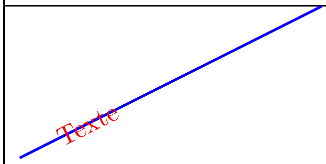
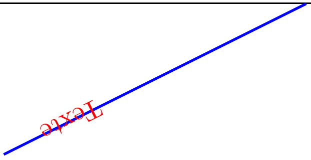
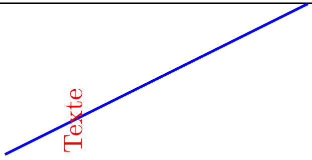
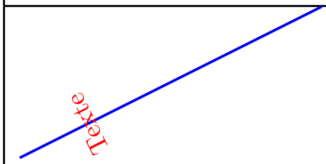
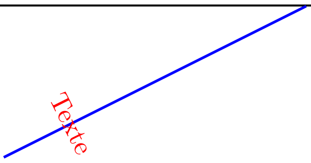
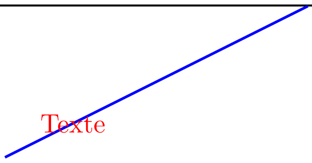
10.12 ArrowNotch

\curvepnodes[plotpoints=100]{1}{1.1}{sin(t)|sin(2*t)}{A}	
	
\ **ArrowNotch**[arrowscale=10]{A}{0}{>}{X} \psline[arrowscale=5]{-D>}(X)(A0)	\ **ArrowNotch**[arrowscale=10]{A}{0}{<}{V} \psline[arrowscale=5]{-D>}(V)(A0)
	
\ **ArrowNotch**[arrowscale=10]{A}{0}{>}{X} \psline[arrowscale=5]{-D>}(X)(A0)	\ **ArrowNotch**[arrowscale=10]{A}{0}{<}{V} \psline[arrowscale=5]{-D>}(V)(A0)

10.13 Placement d'une étiquette à une distance donnée avec nlput

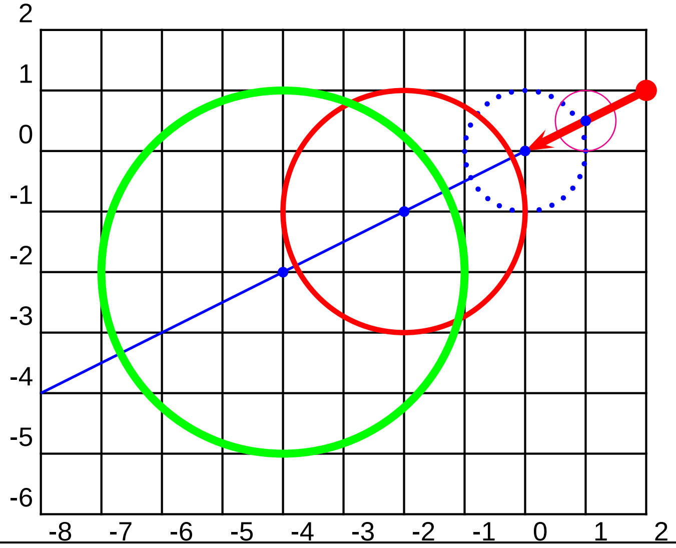
10.14 Placement d'une étiquette à une distance donnée avec nlput


\ **nlput**(B)(C){1cm}{Texte}

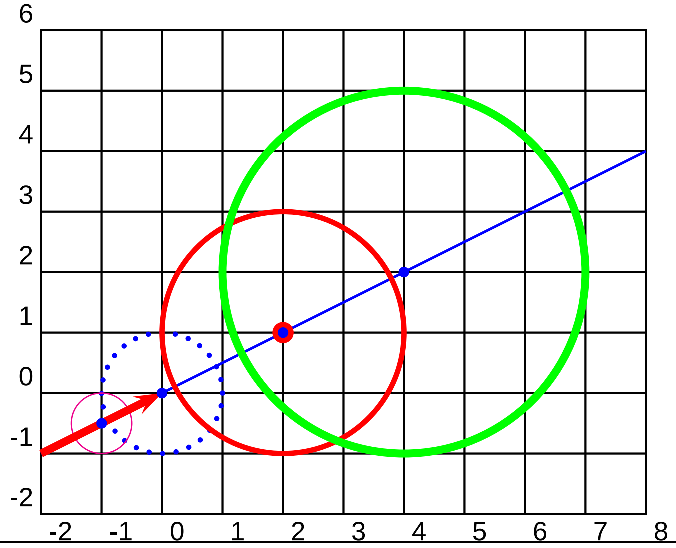
\nlput[nrot=:U](B)(C){1cm}{\red Texte}		
		
nrot=:U	nrot=:U	nrot=90
		
nrot=:L	nrot=:R	sans paramètre

11 Homothétie

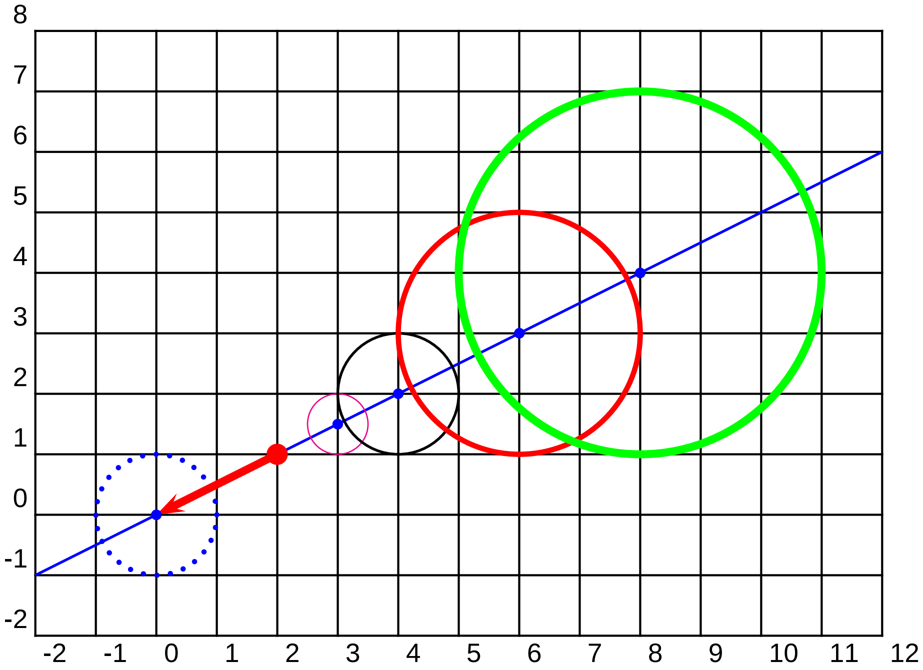
```
\pscircle[linestyle=dotted]{1}
\psHomothetie[linecolor=magenta](2,1){.5}{\pscircle{1}}
\psHomothetie[linecolor=red](2,1){2}{\pscircle{1}}
\psHomothetie[linecolor=green](2,1){3}{\pscircle{1}}
```



```
\pscircle[linestyle=dotted]{1}
\psHomothetie[linecolor=magenta](-2,-1){.5}{\pscircle{1}}
\psHomothetie[linecolor=red](-2,-1){2}{\pscircle{1}}
\psHomothetie[linecolor=green](-2,-1){3}{\pscircle{1}}
```

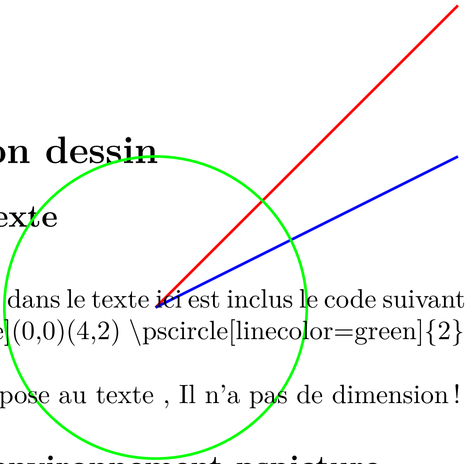


```
\pscircle[linestyle=dotted]{1}
\psHomothetie[linecolor=magenta](2,1){-.5}{\pscircle{1}}
\psHomothetie[linecolor=black](2,1){-1}{\pscircle{1}}
\psHomothetie[linecolor=red](2,1){-2}{\pscircle{1}}
\psHomothetie[linecolor=green](2,1){-3}{\pscircle{1}}
```



12 Placer son dessin

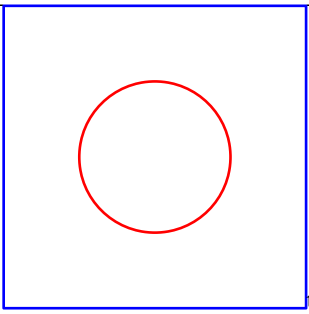
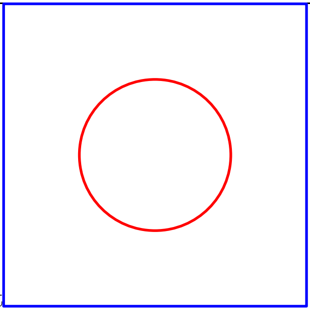
12.1 Dans le texte



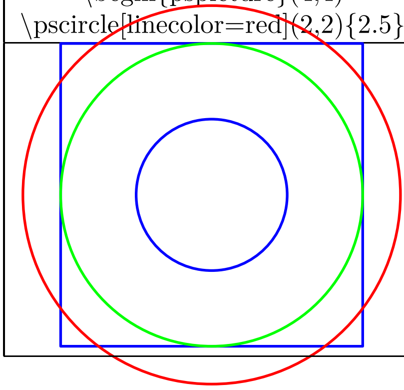
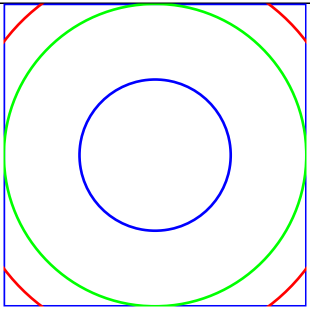
dessin directement dans le texte ici est inclus le code suivant : \psline[linecolor=red](0,0)(4,4) \psline[linecolor=blue](0,0)(4,2) \pscircle[linecolor=green]{2}

Le dessin se superpose au texte , Il n'a pas de dimension !

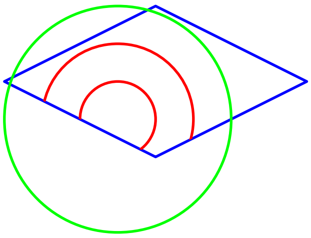
12.2 Dans un environnement pspicture

2 syntaxes	
\pspicture(4,4) \psframe(4,4) \pscircle[linecolor=red](2,2){1cm} **\endpspicture**	**\begin{pspicture}**(4,4) \psframe(4,4) \pscircle[linecolor=red](2,2){1cm} **\end{pspicture}**
texte avant  texte après	texte avant  texte après

12.3 Coupure de l'image

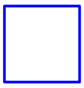
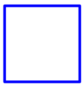
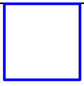
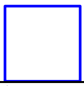
\begin{pspicture}(4,4) \pscircle[linecolor=red](2,2){2.5}		\begin{pspicture}*(4,4) \pscircle[linecolor=red](2,2){2.5}
		

12.4 Rognage partiel



```
\begin{pspicture}*(-2,-2)(3,2)
\psclip {\psdiamond(.5,.5)(2,1)}
\pscircle[linecolor=red]{.5}
\pscircle[linecolor=red]{1}
\endpsclip
\pscircle[linecolor=green]{1.5}
\end{pspicture}
```

12.5 Relative to the text line

avant \begin{pspicture}[shift=*](1,1) \psframe(1,1) \end{pspicture} après			
avant  après	avant  après	avant  après	avant  après
Par défaut	shift=*	shift=.5cm	shift=-.75cm

13 Placer des objets

13.1 Commande rput

syntaxe : \rput*[point de référence]{rotation}(coordonnées){contenu}

13.1.1 Rôle de l'astérisque[4]

objet **\rput**(1,0){objet}	objet **\rput***(1,0){objet}

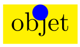
13.1.2 Point de référence

Horizontal			
l	à gauche		\rput*[l](1,0){objet}\qdisk(1,0){3pt}
r	à droite		\rput*[r](1,0){objet}\qdisk(1,0){3pt}
vertical			
t	en haut		\rput*[t](1,0){objet}\qdisk(1,0){3pt}
b	en bas		\rput* [b](1,0){objet}\qdisk(1,0){3pt}
B	sur la ligne d'écriture		\rput*[B](1,0){objet}\qdisk(1,0){3pt}
horizontal et vertical			
rt	à droite et en haut		\rput*[rt](1,0){objet}\qdisk(1,0){3pt}

13.1.3 Angle de rotation de l'objet

\rput*[t]{45}	\rput*[t]{90}	\rput*[b]{90}	\rput*[B]{90}	\rput*[l]{90}	\rput*[r]{90}
					

13.1.4 Angles de rotation en points cardinaux

haut et Est	haut et Ouest	haut et Nord	haut et Sud	gauche et Est	droite et Est
\rput*[t]{E}	\rput*[t]{W}	\rput*[t]{N}	\rput*[t]{S}	\rput*[l]{W}	\rput*[r]{W}
					

---

[4] La couleur de fond est en jaune et le point de référence en bleu

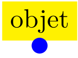
13.2 Commande uput

syntaxe : **\uput***{écartement}[point de référence]{rotation}(coordonnées){contenu}

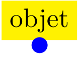
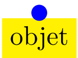
13.2.1 Rôle de l'astérisque [5]

objet	objet
\uput(1,0){objet}	**\uput***(1,0){objet}

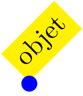
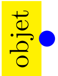
13.2.2 Point de référence : angle

à 45°		\uput*[45](1,0){objet}\qdisk(1,0){3pt}
à 90°		\uput*[90](1,0){objet}\qdisk(1,0){3pt}
à 120°		\uput*[120](1,0){objet}\qdisk(1,0){3pt}

13.2.3 Point de référence : points cardinaux

\uput*[u]	\uput*[r]	\uput*[d]	\uput*[l]	\uput*[ul]	\uput*[ur]
					

13.2.4 Angle de rotation de l'objet

\uput*[u]{45}	\uput*[u]{90}	\uput*[d]{90}	\uput*[l]{90}	\uput*[r]{90}	\uput*[ur]{90}
					

---

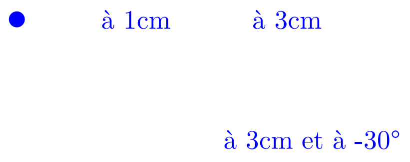
[5] La couleur de fond est en jaune et le point de référence en bleu

13.2.5 Écartement de l'objet par rapport au point de référence

Par défaut : labelsep= 0.5 pt

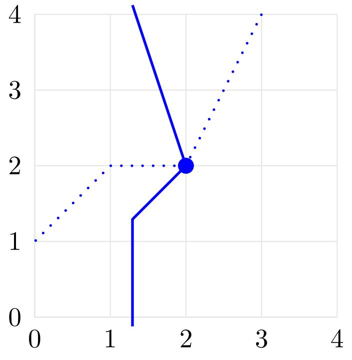
Exemple :

```
\psset{labelsep=1cm }                  % nouveau écartement par défaut
\uput(1,0){ à 1cm }                    % utilisation nouveau écartement par défaut
\uput {3cm}(1,0){à 3cm}                % écartement spécifié à 3 cm
\uput{3cm}[-30](1,0){à 3cm et à -30°}  % écartement spécifié à 3 et à un angle de -30°
\qdisk(1,0){3pt}                       % point de référence
```



13.3 Commande psrotate

\psrotate(2,1){45}{\psline(0, 1)(1, 2)(2, 2)(3, 4)}



14 Créer ses couleurs

Utilisation du module **xcolor** (chargé automatiquement avec le module pstricks)

14.1 Commande newgray

syntaxe : **newgray**{couleur}{pourcentage}

\newgray{G00}{0} \psframe[fillcolor=G00](1,1)					
{0}	{.2}	{.4}	{.6}	{.8}	{1}
⬛	▓	▓	▒	░	⬜

14.2 Commande newrgbcolor

syntaxe : **newrgbcolor**{couleur}{% rouge %vert %bleu} :

\newrgbcolor{C1}{1 0 0} \psframe[fillcolor=C1](1,1)							
{1 0 0}	{0 1 0}	{0 0 1}	{0 0 .5}	{.5 .5 0}	{0 .5 .5}	{.2 .5 .8}	{.8 .5 .8}
🟥	🟩	🟦	🟦	🟫	🟩	🟦	🟪

14.3 Commande newhsbcolor

syntaxe **newhsbcolor**{color}{teinte saturation luminosité}

\newhsbcolor{C1}{0 .5 .5} \psframe[fillcolor=C1](1,1)							
{0 .5 .5}	{.5 .5 .5}	{1 .5 .5}	{.5 0 .5}	{.5 1 .5}	{.5 .5 0}	{.5 .5 .8}	{.5 .5 1}
🟫	🟩	🟫	▒	🟩	⬛	🟦	🟦

14.4 Commande newcmykcolor

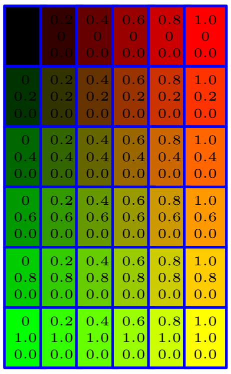
syntaxe **newcmykcolor**{couleur}{cyan magenta jaune noir}

\newcmykcolor{C1}{1 0 0 0} \psframe[fillcolor=C1](1,1)							
{1 0 0 0}	{0 1 0 0}	{0 0 1 0}	{.5 .5 0 0}	{0 .5 .5 0}	{.5 .5 0.5 0}	{1 0 0 .2}	{1 0 0 .8}
🟦	🟪	🟨	🟪	🟧	▒	🟦	🟦

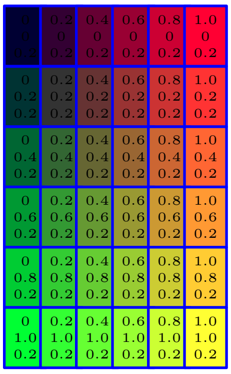
14.5 Tableau des couleurs

14.5.1 Commande newrgbcolor

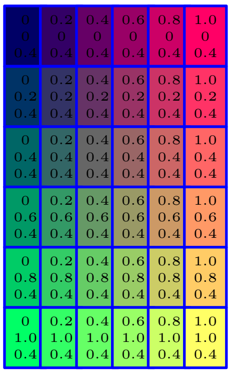
rouge
vert
bleu



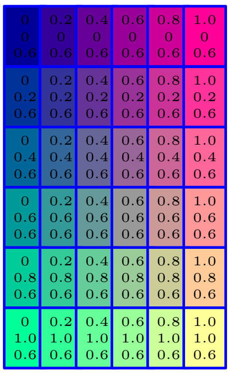
	0.2 0 0.0	0.4 0 0.0	0.6 0 0.0	0.8 0 0.0	1.0 0 0.0
0 0.2 0.0	0.2 0.2 0.0	0.4 0.2 0.0	0.6 0.2 0.0	0.8 0.2 0.0	1.0 0.2 0.0
0 0.4 0.0	0.2 0.4 0.0	0.4 0.4 0.0	0.6 0.4 0.0	0.8 0.4 0.0	1.0 0.4 0.0
0 0.6 0.0	0.2 0.6 0.0	0.4 0.6 0.0	0.6 0.6 0.0	0.8 0.6 0.0	1.0 0.6 0.0
0 0.8 0.0	0.2 0.8 0.0	0.4 0.8 0.0	0.6 0.8 0.0	0.8 0.8 0.0	1.0 0.8 0.0
0 1.0 0.0	0.2 1.0 0.0	0.4 1.0 0.0	0.6 1.0 0.0	0.8 1.0 0.0	1.0 1.0 0.0



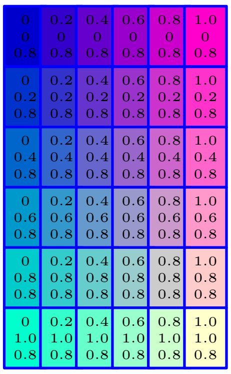
0 0 0.2	0.2 0 0.2	0.4 0 0.2	0.6 0 0.2	0.8 0 0.2	1.0 0 0.2
0 0.2 0.2	0.2 0.2 0.2	0.4 0.2 0.2	0.6 0.2 0.2	0.8 0.2 0.2	1.0 0.2 0.2
0 0.4 0.2	0.2 0.4 0.2	0.4 0.4 0.2	0.6 0.4 0.2	0.8 0.4 0.2	1.0 0.4 0.2
0 0.6 0.2	0.2 0.6 0.2	0.4 0.6 0.2	0.6 0.6 0.2	0.8 0.6 0.2	1.0 0.6 0.2
0 0.8 0.2	0.2 0.8 0.2	0.4 0.8 0.2	0.6 0.8 0.2	0.8 0.8 0.2	1.0 0.8 0.2
0 1.0 0.2	0.2 1.0 0.2	0.4 1.0 0.2	0.6 1.0 0.2	0.8 1.0 0.2	1.0 1.0 0.2



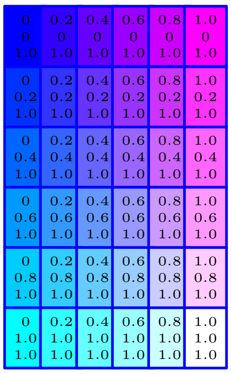
0 0 0.4	0.2 0 0.4	0.4 0 0.4	0.6 0 0.4	0.8 0 0.4	1.0 0 0.4
0 0.2 0.4	0.2 0.2 0.4	0.4 0.2 0.4	0.6 0.2 0.4	0.8 0.2 0.4	1.0 0.2 0.4
0 0.4 0.4	0.2 0.4 0.4	0.4 0.4 0.4	0.6 0.4 0.4	0.8 0.4 0.4	1.0 0.4 0.4
0 0.6 0.4	0.2 0.6 0.4	0.4 0.6 0.4	0.6 0.6 0.4	0.8 0.6 0.4	1.0 0.6 0.4
0 0.8 0.4	0.2 0.8 0.4	0.4 0.8 0.4	0.6 0.8 0.4	0.8 0.8 0.4	1.0 0.8 0.4
0 1.0 0.4	0.2 1.0 0.4	0.4 1.0 0.4	0.6 1.0 0.4	0.8 1.0 0.4	1.0 1.0 0.4



0 0 0.6	0.2 0 0.6	0.4 0 0.6	0.6 0 0.6	0.8 0 0.6	1.0 0 0.6
0 0.2 0.6	0.2 0.2 0.6	0.4 0.2 0.6	0.6 0.2 0.6	0.8 0.2 0.6	1.0 0.2 0.6
0 0.4 0.6	0.2 0.4 0.6	0.4 0.4 0.6	0.6 0.4 0.6	0.8 0.4 0.6	1.0 0.4 0.6
0 0.6 0.6	0.2 0.6 0.6	0.4 0.6 0.6	0.6 0.6 0.6	0.8 0.6 0.6	1.0 0.6 0.6
0 0.8 0.6	0.2 0.8 0.6	0.4 0.8 0.6	0.6 0.8 0.6	0.8 0.8 0.6	1.0 0.8 0.6
0 1.0 0.6	0.2 1.0 0.6	0.4 1.0 0.6	0.6 1.0 0.6	0.8 1.0 0.6	1.0 1.0 0.6



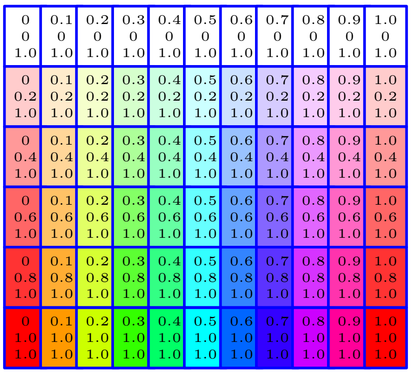
0 0 0.8	0.2 0 0.8	0.4 0 0.8	0.6 0 0.8	0.8 0 0.8	1.0 0 0.8
0 0.2 0.8	0.2 0.2 0.8	0.4 0.2 0.8	0.6 0.2 0.8	0.8 0.2 0.8	1.0 0.2 0.8
0 0.4 0.8	0.2 0.4 0.8	0.4 0.4 0.8	0.6 0.4 0.8	0.8 0.4 0.8	1.0 0.4 0.8
0 0.6 0.8	0.2 0.6 0.8	0.4 0.6 0.8	0.6 0.6 0.8	0.8 0.6 0.8	1.0 0.6 0.8
0 0.8 0.8	0.2 0.8 0.8	0.4 0.8 0.8	0.6 0.8 0.8	0.8 0.8 0.8	1.0 0.8 0.8
0 1.0 0.8	0.2 1.0 0.8	0.4 1.0 0.8	0.6 1.0 0.8	0.8 1.0 0.8	1.0 1.0 0.8



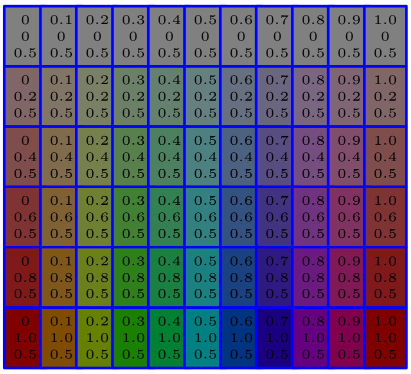
0 0 1.0	0.2 0 1.0	0.4 0 1.0	0.6 0 1.0	0.8 0 1.0	1.0 0 1.0
0 0.2 1.0	0.2 0.2 1.0	0.4 0.2 1.0	0.6 0.2 1.0	0.8 0.2 1.0	1.0 0.2 1.0
0 0.4 1.0	0.2 0.4 1.0	0.4 0.4 1.0	0.6 0.4 1.0	0.8 0.4 1.0	1.0 0.4 1.0
0 0.6 1.0	0.2 0.6 1.0	0.4 0.6 1.0	0.6 0.6 1.0	0.8 0.6 1.0	1.0 0.6 1.0
0 0.8 1.0	0.2 0.8 1.0	0.4 0.8 1.0	0.6 0.8 1.0	0.8 0.8 1.0	1.0 0.8 1.0
0 1.0 1.0	0.2 1.0 1.0	0.4 1.0 1.0	0.6 1.0 1.0	0.8 1.0 1.0	1.0 1.0 1.0

14.6 Commande newhsbcolor

teinte
saturation
luminosité



0 0 1.0	0.1 0 1.0	0.2 0 1.0	0.3 0 1.0	0.4 0 1.0	0.5 0 1.0	0.6 0 1.0	0.7 0 1.0	0.8 0 1.0	0.9 0 1.0	1.0 0 1.0
0 0.2 1.0	0.1 0.2 1.0	0.2 0.2 1.0	0.3 0.2 1.0	0.4 0.2 1.0	0.5 0.2 1.0	0.6 0.2 1.0	0.7 0.2 1.0	0.8 0.2 1.0	0.9 0.2 1.0	1.0 0.2 1.0
0 0.4 1.0	0.1 0.4 1.0	0.2 0.4 1.0	0.3 0.4 1.0	0.4 0.4 1.0	0.5 0.4 1.0	0.6 0.4 1.0	0.7 0.4 1.0	0.8 0.4 1.0	0.9 0.4 1.0	1.0 0.4 1.0
0 0.6 1.0	0.1 0.6 1.0	0.2 0.6 1.0	0.3 0.6 1.0	0.4 0.6 1.0	0.5 0.6 1.0	0.6 0.6 1.0	0.7 0.6 1.0	0.8 0.6 1.0	0.9 0.6 1.0	1.0 0.6 1.0
0 0.8 1.0	0.1 0.8 1.0	0.2 0.8 1.0	0.3 0.8 1.0	0.4 0.8 1.0	0.5 0.8 1.0	0.6 0.8 1.0	0.7 0.8 1.0	0.8 0.8 1.0	0.9 0.8 1.0	1.0 0.8 1.0
0 1.0 1.0	0.1 1.0 1.0	0.2 1.0 1.0	0.3 1.0 1.0	0.4 1.0 1.0	0.5 1.0 1.0	0.6 1.0 1.0	0.7 1.0 1.0	0.8 1.0 1.0	0.9 1.0 1.0	1.0 1.0 1.0



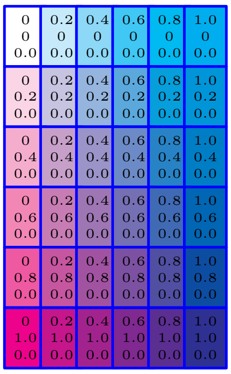
0 0 0.5	0.1 0 0.5	0.2 0 0.5	0.3 0 0.5	0.4 0 0.5	0.5 0 0.5	0.6 0 0.5	0.7 0 0.5	0.8 0 0.5	0.9 0 0.5	1.0 0 0.5
0 0.2 0.5	0.1 0.2 0.5	0.2 0.2 0.5	0.3 0.2 0.5	0.4 0.2 0.5	0.5 0.2 0.5	0.6 0.2 0.5	0.7 0.2 0.5	0.8 0.2 0.5	0.9 0.2 0.5	1.0 0.2 0.5
0 0.4 0.5	0.1 0.4 0.5	0.2 0.4 0.5	0.3 0.4 0.5	0.4 0.4 0.5	0.5 0.4 0.5	0.6 0.4 0.5	0.7 0.4 0.5	0.8 0.4 0.5	0.9 0.4 0.5	1.0 0.4 0.5
0 0.6 0.5	0.1 0.6 0.5	0.2 0.6 0.5	0.3 0.6 0.5	0.4 0.6 0.5	0.5 0.6 0.5	0.6 0.6 0.5	0.7 0.6 0.5	0.8 0.6 0.5	0.9 0.6 0.5	1.0 0.6 0.5
0 0.8 0.5	0.1 0.8 0.5	0.2 0.8 0.5	0.3 0.8 0.5	0.4 0.8 0.5	0.5 0.8 0.5	0.6 0.8 0.5	0.7 0.8 0.5	0.8 0.8 0.5	0.9 0.8 0.5	1.0 0.8 0.5
0 1.0 0.5	0.1 1.0 0.5	0.2 1.0 0.5	0.3 1.0 0.5	0.4 1.0 0.5	0.5 1.0 0.5	0.6 1.0 0.5	0.7 1.0 0.5	0.8 1.0 0.5	0.9 1.0 0.5	1.0 1.0 0.5

14.7 Commande newcmykcolor

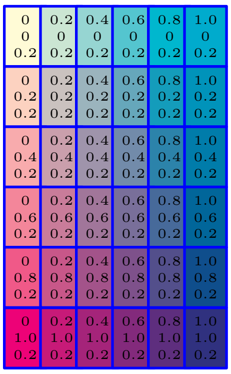
cyan
magenta
jaune

noir=0

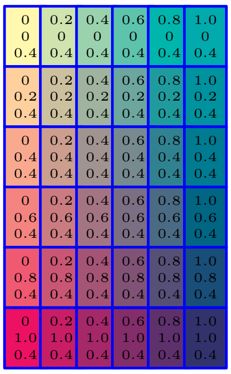
noir=0



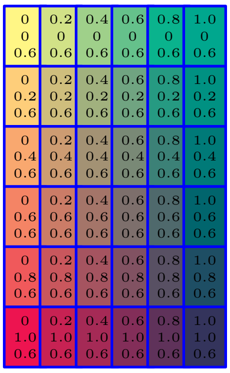
0 0 0.0	0.2 0 0.0	0.4 0 0.0	0.6 0 0.0	0.8 0 0.0	1.0 0 0.0
0 0.2 0.0	0.2 0.2 0.0	0.4 0.2 0.0	0.6 0.2 0.0	0.8 0.2 0.0	1.0 0.2 0.0
0 0.4 0.0	0.2 0.4 0.0	0.4 0.4 0.0	0.6 0.4 0.0	0.8 0.4 0.0	1.0 0.4 0.0
0 0.6 0.0	0.2 0.6 0.0	0.4 0.6 0.0	0.6 0.6 0.0	0.8 0.6 0.0	1.0 0.6 0.0
0 0.8 0.0	0.2 0.8 0.0	0.4 0.8 0.0	0.6 0.8 0.0	0.8 0.8 0.0	1.0 0.8 0.0
0 1.0 0.0	0.2 1.0 0.0	0.4 1.0 0.0	0.6 1.0 0.0	0.8 1.0 0.0	1.0 1.0 0.0



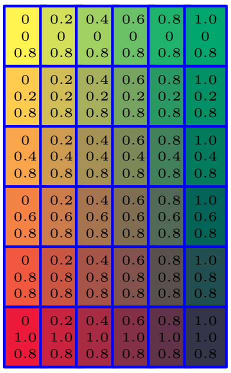
0 0 0.2	0.2 0 0.2	0.4 0 0.2	0.6 0 0.2	0.8 0 0.2	1.0 0 0.2
0 0.2 0.2	0.2 0.2 0.2	0.4 0.2 0.2	0.6 0.2 0.2	0.8 0.2 0.2	1.0 0.2 0.2
0 0.4 0.2	0.2 0.4 0.2	0.4 0.4 0.2	0.6 0.4 0.2	0.8 0.4 0.2	1.0 0.4 0.2
0 0.6 0.2	0.2 0.6 0.2	0.4 0.6 0.2	0.6 0.6 0.2	0.8 0.6 0.2	1.0 0.6 0.2
0 0.8 0.2	0.2 0.8 0.2	0.4 0.8 0.2	0.6 0.8 0.2	0.8 0.8 0.2	1.0 0.8 0.2
0 1.0 0.2	0.2 1.0 0.2	0.4 1.0 0.2	0.6 1.0 0.2	0.8 1.0 0.2	1.0 1.0 0.2



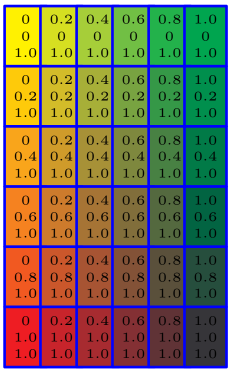
0 0 0.4	0.2 0 0.4	0.4 0 0.4	0.6 0 0.4	0.8 0 0.4	1.0 0 0.4
0 0.2 0.4	0.2 0.2 0.4	0.4 0.2 0.4	0.6 0.2 0.4	0.8 0.2 0.4	1.0 0.2 0.4
0 0.4 0.4	0.2 0.4 0.4	0.4 0.4 0.4	0.6 0.4 0.4	0.8 0.4 0.4	1.0 0.4 0.4
0 0.6 0.4	0.2 0.6 0.4	0.4 0.6 0.4	0.6 0.6 0.4	0.8 0.6 0.4	1.0 0.6 0.4
0 0.8 0.4	0.2 0.8 0.4	0.4 0.8 0.4	0.6 0.8 0.4	0.8 0.8 0.4	1.0 0.8 0.4
0 1.0 0.4	0.2 1.0 0.4	0.4 1.0 0.4	0.6 1.0 0.4	0.8 1.0 0.4	1.0 1.0 0.4



0 0 0.6	0.2 0 0.6	0.4 0 0.6	0.6 0 0.6	0.8 0 0.6	1.0 0 0.6
0 0.2 0.6	0.2 0.2 0.6	0.4 0.2 0.6	0.6 0.2 0.6	0.8 0.2 0.6	1.0 0.2 0.6
0 0.4 0.6	0.2 0.4 0.6	0.4 0.4 0.6	0.6 0.4 0.6	0.8 0.4 0.6	1.0 0.4 0.6
0 0.6 0.6	0.2 0.6 0.6	0.4 0.6 0.6	0.6 0.6 0.6	0.8 0.6 0.6	1.0 0.6 0.6
0 0.8 0.6	0.2 0.8 0.6	0.4 0.8 0.6	0.6 0.8 0.6	0.8 0.8 0.6	1.0 0.8 0.6
0 1.0 0.6	0.2 1.0 0.6	0.4 1.0 0.6	0.6 1.0 0.6	0.8 1.0 0.6	1.0 1.0 0.6



0 0 0.8	0.2 0 0.8	0.4 0 0.8	0.6 0 0.8	0.8 0 0.8	1.0 0 0.8
0 0.2 0.8	0.2 0.2 0.8	0.4 0.2 0.8	0.6 0.2 0.8	0.8 0.2 0.8	1.0 0.2 0.8
0 0.4 0.8	0.2 0.4 0.8	0.4 0.4 0.8	0.6 0.4 0.8	0.8 0.4 0.8	1.0 0.4 0.8
0 0.6 0.8	0.2 0.6 0.8	0.4 0.6 0.8	0.6 0.6 0.8	0.8 0.6 0.8	1.0 0.6 0.8
0 0.8 0.8	0.2 0.8 0.8	0.4 0.8 0.8	0.6 0.8 0.8	0.8 0.8 0.8	1.0 0.8 0.8
0 1.0 0.8	0.2 1.0 0.8	0.4 1.0 0.8	0.6 1.0 0.8	0.8 1.0 0.8	1.0 1.0 0.8

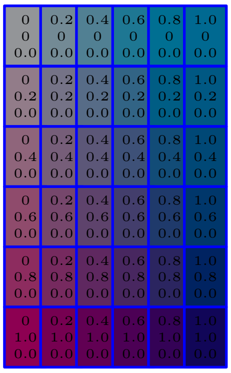


0 0 1.0	0.2 0 1.0	0.4 0 1.0	0.6 0 1.0	0.8 0 1.0	1.0 0 1.0
0 0.2 1.0	0.2 0.2 1.0	0.4 0.2 1.0	0.6 0.2 1.0	0.8 0.2 1.0	1.0 0.2 1.0
0 0.4 1.0	0.2 0.4 1.0	0.4 0.4 1.0	0.6 0.4 1.0	0.8 0.4 1.0	1.0 0.4 1.0
0 0.6 1.0	0.2 0.6 1.0	0.4 0.6 1.0	0.6 0.6 1.0	0.8 0.6 1.0	1.0 0.6 1.0
0 0.8 1.0	0.2 0.8 1.0	0.4 0.8 1.0	0.6 0.8 1.0	0.8 0.8 1.0	1.0 0.8 1.0
0 1.0 1.0	0.2 1.0 1.0	0.4 1.0 1.0	0.6 1.0 1.0	0.8 1.0 1.0	1.0 1.0 1.0

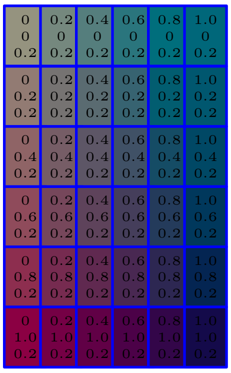
cyan
magenta
jaune

noir=0

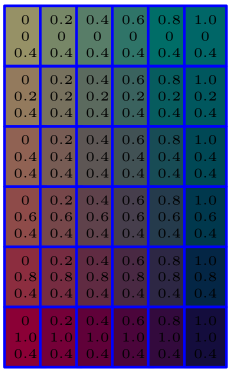
noir=0



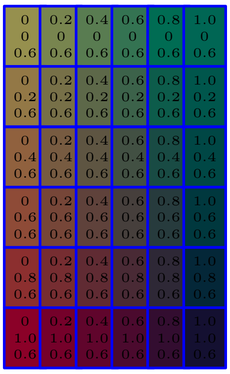
0 0 0.0	0.2 0 0.0	0.4 0 0.0	0.6 0 0.0	0.8 0 0.0	1.0 0 0.0
0 0.2 0.0	0.2 0.2 0.0	0.4 0.2 0.0	0.6 0.2 0.0	0.8 0.2 0.0	1.0 0.2 0.0
0 0.4 0.0	0.2 0.4 0.0	0.4 0.4 0.0	0.6 0.4 0.0	0.8 0.4 0.0	1.0 0.4 0.0
0 0.6 0.0	0.2 0.6 0.0	0.4 0.6 0.0	0.6 0.6 0.0	0.8 0.6 0.0	1.0 0.6 0.0
0 0.8 0.0	0.2 0.8 0.0	0.4 0.8 0.0	0.6 0.8 0.0	0.8 0.8 0.0	1.0 0.8 0.0
0 1.0 0.0	0.2 1.0 0.0	0.4 1.0 0.0	0.6 1.0 0.0	0.8 1.0 0.0	1.0 1.0 0.0



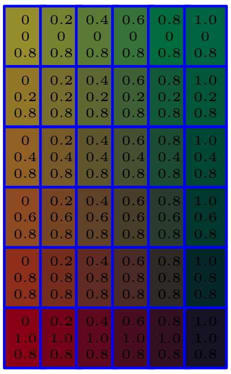
0 0 0.2	0.2 0 0.2	0.4 0 0.2	0.6 0 0.2	0.8 0 0.2	1.0 0 0.2
0 0.2 0.2	0.2 0.2 0.2	0.4 0.2 0.2	0.6 0.2 0.2	0.8 0.2 0.2	1.0 0.2 0.2
0 0.4 0.2	0.2 0.4 0.2	0.4 0.4 0.2	0.6 0.4 0.2	0.8 0.4 0.2	1.0 0.4 0.2
0 0.6 0.2	0.2 0.6 0.2	0.4 0.6 0.2	0.6 0.6 0.2	0.8 0.6 0.2	1.0 0.6 0.2
0 0.8 0.2	0.2 0.8 0.2	0.4 0.8 0.2	0.6 0.8 0.2	0.8 0.8 0.2	1.0 0.8 0.2
0 1.0 0.2	0.2 1.0 0.2	0.4 1.0 0.2	0.6 1.0 0.2	0.8 1.0 0.2	1.0 1.0 0.2



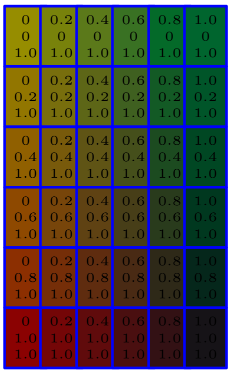
0 0 0.4	0.2 0 0.4	0.4 0 0.4	0.6 0 0.4	0.8 0 0.4	1.0 0 0.4
0 0.2 0.4	0.2 0.2 0.4	0.4 0.2 0.4	0.6 0.2 0.4	0.8 0.2 0.4	1.0 0.2 0.4
0 0.4 0.4	0.2 0.4 0.4	0.4 0.4 0.4	0.6 0.4 0.4	0.8 0.4 0.4	1.0 0.4 0.4
0 0.6 0.4	0.2 0.6 0.4	0.4 0.6 0.4	0.6 0.6 0.4	0.8 0.6 0.4	1.0 0.6 0.4
0 0.8 0.4	0.2 0.8 0.4	0.4 0.8 0.4	0.6 0.8 0.4	0.8 0.8 0.4	1.0 0.8 0.4
0 1.0 0.4	0.2 1.0 0.4	0.4 1.0 0.4	0.6 1.0 0.4	0.8 1.0 0.4	1.0 1.0 0.4



0 0 0.6	0.2 0 0.6	0.4 0 0.6	0.6 0 0.6	0.8 0 0.6	1.0 0 0.6
0 0.2 0.6	0.2 0.2 0.6	0.4 0.2 0.6	0.6 0.2 0.6	0.8 0.2 0.6	1.0 0.2 0.6
0 0.4 0.6	0.2 0.4 0.6	0.4 0.4 0.6	0.6 0.4 0.6	0.8 0.4 0.6	1.0 0.4 0.6
0 0.6 0.6	0.2 0.6 0.6	0.4 0.6 0.6	0.6 0.6 0.6	0.8 0.6 0.6	1.0 0.6 0.6
0 0.8 0.6	0.2 0.8 0.6	0.4 0.8 0.6	0.6 0.8 0.6	0.8 0.8 0.6	1.0 0.8 0.6
0 1.0 0.6	0.2 1.0 0.6	0.4 1.0 0.6	0.6 1.0 0.6	0.8 1.0 0.6	1.0 1.0 0.6

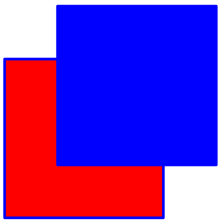
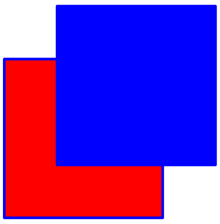
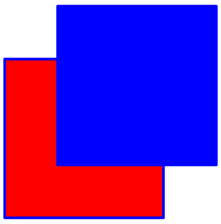
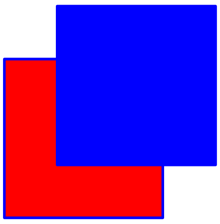


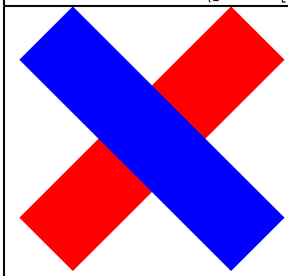
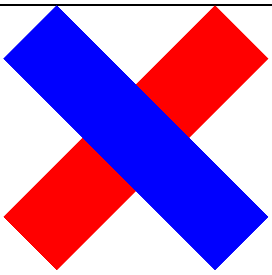
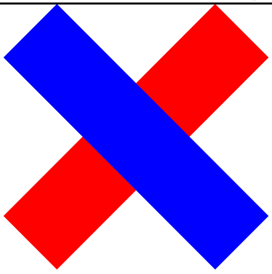
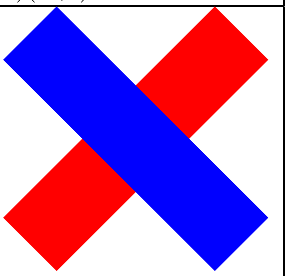
0 0 0.8	0.2 0 0.8	0.4 0 0.8	0.6 0 0.8	0.8 0 0.8	1.0 0 0.8
0 0.2 0.8	0.2 0.2 0.8	0.4 0.2 0.8	0.6 0.2 0.8	0.8 0.2 0.8	1.0 0.2 0.8
0 0.4 0.8	0.2 0.4 0.8	0.4 0.4 0.8	0.6 0.4 0.8	0.8 0.4 0.8	1.0 0.4 0.8
0 0.6 0.8	0.2 0.6 0.8	0.4 0.6 0.8	0.6 0.6 0.8	0.8 0.6 0.8	1.0 0.6 0.8
0 0.8 0.8	0.2 0.8 0.8	0.4 0.8 0.8	0.6 0.8 0.8	0.8 0.8 0.8	1.0 0.8 0.8
0 1.0 0.8	0.2 1.0 0.8	0.4 1.0 0.8	0.6 1.0 0.8	0.8 1.0 0.8	1.0 1.0 0.8



0 0 1.0	0.2 0 1.0	0.4 0 1.0	0.6 0 1.0	0.8 0 1.0	1.0 0 1.0
0 0.2 1.0	0.2 0.2 1.0	0.4 0.2 1.0	0.6 0.2 1.0	0.8 0.2 1.0	1.0 0.2 1.0
0 0.4 1.0	0.2 0.4 1.0	0.4 0.4 1.0	0.6 0.4 1.0	0.8 0.4 1.0	1.0 0.4 1.0
0 0.6 1.0	0.2 0.6 1.0	0.4 0.6 1.0	0.6 0.6 1.0	0.8 0.6 1.0	1.0 0.6 1.0
0 0.8 1.0	0.2 0.8 1.0	0.4 0.8 1.0	0.6 0.8 1.0	0.8 0.8 1.0	1.0 0.8 1.0
0 1.0 1.0	0.2 1.0 1.0	0.4 1.0 1.0	0.6 1.0 1.0	0.8 1.0 1.0	1.0 1.0 1.0

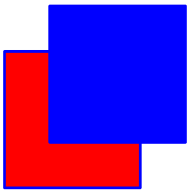
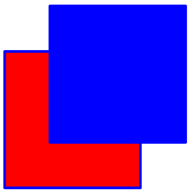
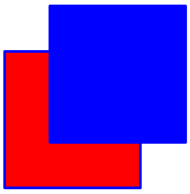
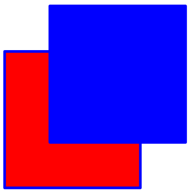
14.8 Opacité des couleurs

\psframe[fillcolor=blue,opacity=0.7](-1,-1)(2,2)](-2,0)(2,0)			
			
opacity =0.7	opacity =0.5	opacity =0.2	opacity =0

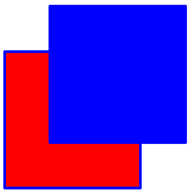
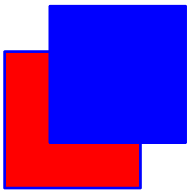
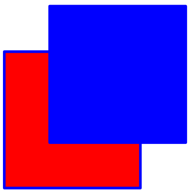
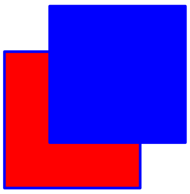
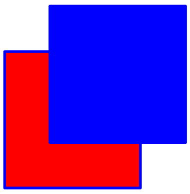
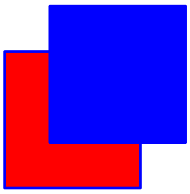
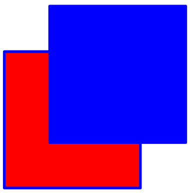
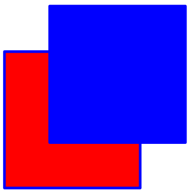
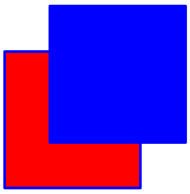
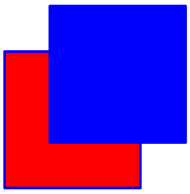
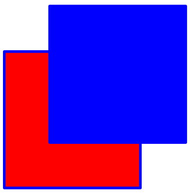
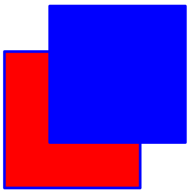
\psline[linewidth=1cm,linecolor=blue,strokeopacity =0.7](2,-2)(-2,2)			
			
strokeopacity =0.7	strokeopacity =0.5	strokeopacity =0.2	strokeopacity =0

14.9 Transparence des couleurs

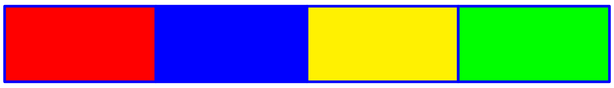
blendmode (Par défaut : blendmode=0)

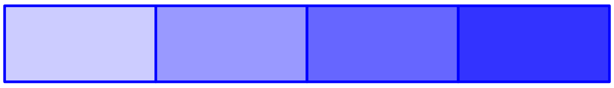
\psset{blendmode=1} (type /Compatible)	\psset{blendmode=2} (type /Screen)	\psset{blendmode=3} (type /Multiply)	\psset{blendmode=0} (type /Normal)
			
\psframe[fillcolor=red,fillstyle=shape](-2,-2)(1,1) \psframe[fillcolor=blue,fillstyle=shape](-1,-1)(2,2)			

shapealpha (Par défaut : shapealpha=0.6)

	\psset{blendmode=1}	\psset{blendmode=2}	\psset{blendmode=3}	\psset{blendmode=0}
shapealpha=0				
shapealpha=0.3				
shapealpha=1				
\psframe[fillcolor=blue,fillstyle=shape,shapealpha=1](-1,-1)(2,2)				

14.10 en noir et blanc , en niveaux de gris ou en couleur

\pssetMonochrome \psframe[fillstyle=solid,fillcolor=red](2,1) \psframe[fillstyle=solid,fillcolor=blue](2,0)(4,1) \psframe[fillstyle=solid,fillcolor=yellow](4,0)(6,1) \psframe[fillstyle=solid,fillcolor=green](6,0)(8,1)	
\pssetMonochrome	
\pssetGrayscale	
\psresetColor	

\pssetMonochrome \psframe[fillstyle=solid,fillcolor=blue!20](2,1) \psframe[fillstyle=solid,fillcolor=blue!40](2,0)(4,1) \psframe[fillstyle=solid,fillcolor=blue!60](4,0)(6,1) \psframe[fillstyle=solid,fillcolor=blue!80](6,0)(8,1)	
\pssetMonochrome	
\pssetGrayscale	
\psresetColor	

15 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
\psframebox[fillcolor=yellow,fillstyle=solid]{    % une boite de texte de couleur jaune
\parbox{ .5\linewidth }                           % parbox pour limiter la largeur de la boite
{\centering                                       % centrage du texte dans la boite
#1} }\end{center}                                 % #1 correspond à l'argument
}
```

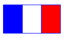
Utilisation : \maboite{contenu}

contenu

Exemple : commande sans variable :

Création

```
\newcommand{\DFR}\psset{unit=.25cm,fillstyle=solid,linewidth=0pt} \begin{pspicture*}(3,1.5)
\psframe[fillcolor=blue](1,1.5) \psframe[fillcolor=white](1,0)(2,1.5)\psframe[fillcolor=red](2,0)(3,1.5)
\end{pspicture*}
```

Utilisation : \DFR 

16 Créer ses styles

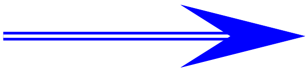
syntaxe : **\newpsstyle**{nom}{paramètres}

Exemple :

Définition du nouveau style :

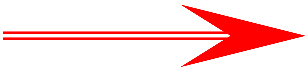
\newpsstyle{mafleche}{arrowsize=4pt 6,arrowlength=2,doubleline=true,linewidth=1pt}

Utilisation du nouveau style : \psline[style=mafleche]{->}(0,0)(3,0)

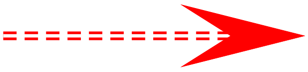


Ajout ou modification d'un paramètre du style

\addtopsstyle{mafleche}{linecolor=red}



\addtopsstyle{mafleche}{linestyle=dashed}



17 Créer ses objets

syntaxe : **\newpsobject**{nom}{objet}{paramètres} :

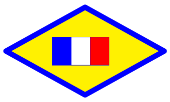
Exemple :
\newpsobject{maboite}{psframebox}{fillstyle=solid,fillcolor=yellow,linewidth=2pt,linecolor=red}

\maboite{ma boite personnalisée} ma boite personnalisée

18 Mettre des objets en boîte

\psframebox*{objet}		
	sans astérisque	**avec astérisque**
\psframebox*	objet	objet
\psdblframebox*	objet	objet
\psshadowbox*	objet	objet
\pscirclebox*	objet	objet
\psovalbox*	objet	objet
\psdiabox*	objet	objet
\pstribox*	objet	objet

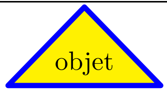
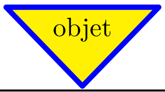
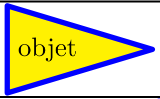
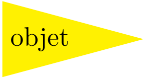
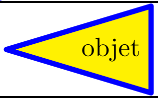
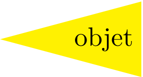
Exemple : \psdiabox{\DFR}

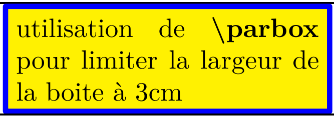


18.1 Options

\psframebox framesep=.5cm]{framesep=.5cm}		
Par défaut	framesep=0cm	framesep=.5cm
Par défaut : framesep=3pt	framesep=0cm	framesep=.5cm

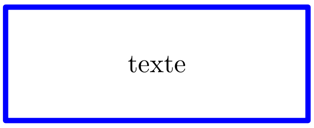
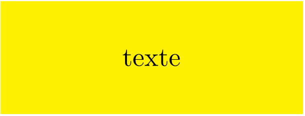
boxsep Par défaut : true (Ce paramètre ne s'applique qu'à \psframebox, \pscirclebox et \psovalbox)
texte avant boxsep=true texte entre les 2 boites boxsep=false texte après

Option trimode pour \pstribox		
	sans astérisque	**avec astérisque**
\pstribox*[trimode=U]		
\pstribox*[trimode=D]		
\pstribox*[trimode=R]		
\pstribox*[trimode=L]		

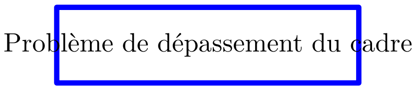
\psframebox{\parbox[l]{3cm}{utilisation de **\parbox** pour limiter la largeur de la boite à 3cm}}
 utilisation de **\parbox** pour limiter la largeur de la boite à 3cm

19 Mettre des objets en cadre

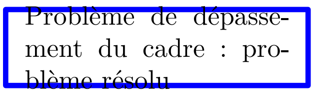
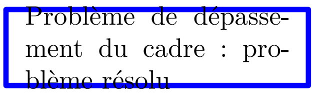
19.1 Texte dans un cadre]

	
\psTextFrame(0,0)(4,2){texte}	\psTextFrame*[linecolor=yellow](0,0)(4,2){texte}

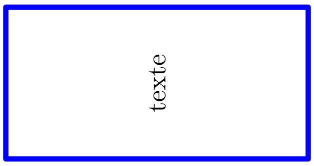
19.1.1 Problème de dépassement du cadre

\psTextFrame(0,0)(4,1){Problème de dépassement du cadre}


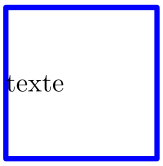
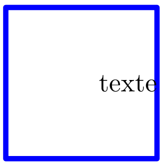
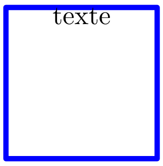
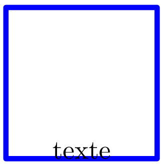
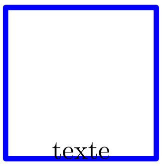
Solutions

	
\psTextFrame(0,0)(4,2){ \parbox{3.5cm}{Problème de dépassement du cadre : problème résolu }}	\psTextFrame(0,0)(4,2){ \begin{minipage}[c]{3.5cm} Problème de dépassement du cadre : problème résolu \end{minipage}}

19.1.2 Rotation du texte

	\psTextFrame[rot=90](0,0.5)(4,2){texte}

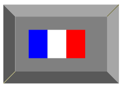
19.1.3 Position du texte

\psTextFrame[ref=l](0,0)(2,2){texte}				
				
ref=l	ref=r	ref=t	ref=b	ref=B

20 Mettre des objets en bouton

utilisation du module « **pst-fr3d** »
syntaxe : **\PstFrameBoxThreeD**[paramètres]{Contenu}

20.1 Sans options

Button	Un ! Deux ! Trois !
`\PstFrameBoxThreeD{Button}`	`\PstFrameBoxThreeD{\shortstack{Un!\\Deux !\\Trois !}}`
	$\frac{1}{\sqrt{3}}$
`\PstFrameBoxThreeD{\DFR}`	`\PstFrameBoxThreeD{$\dfrac{1}{\sqrt{3}}$}`

20.2 Dimensionnement

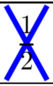
doublesep	doublesep=0	doublesep=0.2	doublesep=0.4
framesep	framesep=0	framesep=0.3	framesep=0.5
linewidth	linewidth=0	linewidth=0.1	linewidth=0.2
framearc	framearc=0.3	framearc=0.6	framearc=1

20.3 Aspect

\PstFrameBoxThreeD[FrameBoxThreeDColorHSB =0 0.3 1]{0 0.3 1}				
FrameBoxThreeDColorHSB	0 0.3 1	0.3 0.3 1	0.6 0.3 1	1 0.3 1
FrameBoxThreeDOn=true/false	true	false	true	false
FrameBoxThreeDOpposite=true/false	=false	=true	=false	=true

FrameBoxThreeDBrightnessDistance	-0.5 mini	-0.2	0 nul	défaut défaut	0.5 maxi

21 Annuler des objets

	
\psCancel{Objet}	**\psCancel**{$\dfrac{1}{2}$}
	
\psCancel*{Objet}	**\psCancel***[opacity=0.5]{Objet}

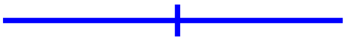
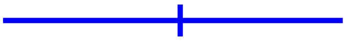
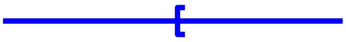
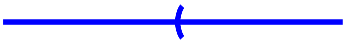
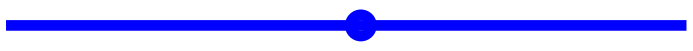
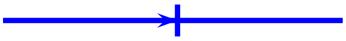
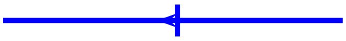
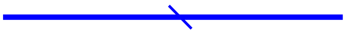
\psCancel[cancelType=x]{Objet}		
		
[cancelType=x]	[cancelType=s]	[cancelType=b]

22 Des lignes et liaisons spéciales

22.1 Trait à main levé

\pslineByHand(0,0)(4,0)		
		
Par défaut	varsteptol=5	VarStepEpsilon=.4
	Par défaut : 2	Par défaut : .8

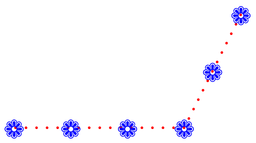
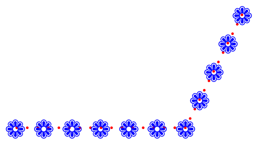
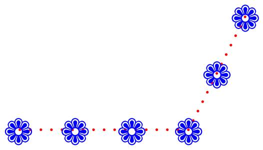
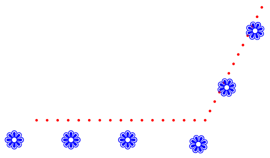
22.2 Symboles sur ligne

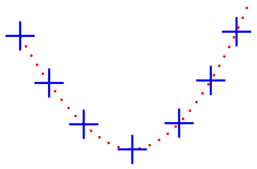
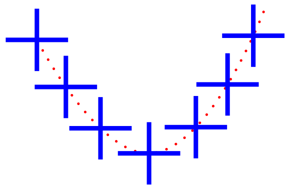
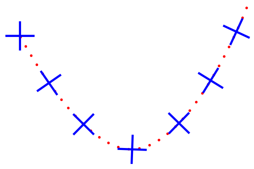
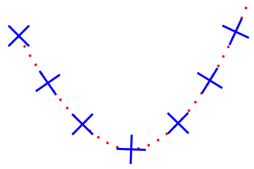
<table>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=->](0.5,0)(5,0)</td><td>\psline[ArrowInside=-<](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-»](0.5,0)(5,0)</td><td>\psline[ArrowInside=-«](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-|](0.5,0)(5,0)</td><td>\psline[ArrowInside=-|*](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-[](0.5,0)(5,0)</td><td>\psline[ArrowInside=-( ](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-o](0.5,0)(5,0)</td><td>\psline[ArrowInside=-*](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=->|](0.5,0)(5,0)</td><td>\psline[ArrowInside=-<|](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-h](0.5,0)(5,0)</td><td>\psline[ArrowInside=-H](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-v](0.5,0)(5,0)</td><td>\psline[ArrowInside=-V](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-f](0.5,0)(5,0)</td><td>\psline[ArrowInside=-F](0.5,0)(5,0)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>\psline[ArrowInside=-t](0.5,0)(5,0)</td><td>\psline[ArrowInside=-T](0.5,0)(5,0)</td></tr>
</table>

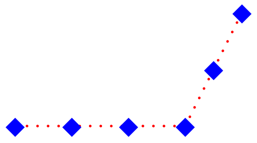
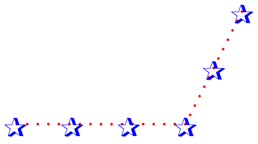
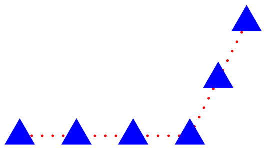
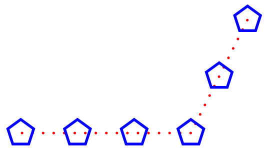
paramètres supplémentaires [1]	
	
ArrowInsidePos=.3 (soit à 30%)	ArrowInsidePos=20 (soit à 20 pt)
	
ArrowInsideNo=5,ArrowInside=->	ArrowInsideNo=3,ArrowInside=-t
	
ArrowInsideOffset=0.1	ArrowInsideOffset=-0.2

22.3 Tracer avec des symboles

[6]

\psline[linestyle=symbol](-2,0)(2,0)			
			
Par défaut	symbolStep=.5 Par défaut : 20pt	symbolWidth=.5cm Par défaut : 10pt	rotateSymbol=true Par défaut : false

\pscurve[linestyle=symbol,symbolFont=PSTricksDotFont](-2,1)(0,-1)(2,1.5)			
			
Par défaut	symbolWidth =1cm Par défaut : 10pt	rotateSymbol =true Par défaut : false	rotateSymbol=true startAngle=45

symbolFont=Dingbats (Par défaut)		symbolFont=PSTricksDotFont	
			
symbol=u	symbol=120	symbol=u	symbol=120

---

[1] pour d'autres paramètres voir page 19

[6] valable seulement pour \psline, \pspolygon,\pscurve \psccurve et \psbezier

22.3.1 Symboles disponibles avec le clavier

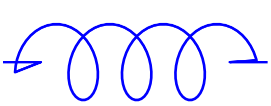
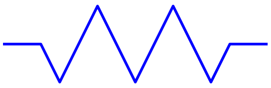
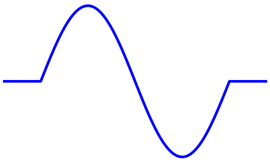
symbolFont=Dingbats (Par défaut)						
A : ✡ ✡	B : ✢ ✢	C : ✣ ✣	D : ✤ ✤	E : ✥ ✥	F : ✦ ✦	G : ✧ ✧
H : ★ ★	I : ✩ ✩	J : ✪ ✪	K : ✫ ✫	L : ✬ ✬	M : ✭ ✭	N : ✮ ✮
O : ✯ ✯	P : ✰ ✰	Q : ✱ ✱	R : ✲ ✲	S : ✳ ✳	T : ✴ ✴	U : ✵ ✵
V : ✶ ✶	W : ✷ ✷	X : ✸ ✸	Y : ✹ ✹	Z : ✺ ✺	1 : ✑ ✑	2 : ✒ ✒
3 : ✓ ✓	4 : ✔ ✔	5 : ✕ ✕	6 : ✖ ✖	7 : ✗ ✗	8 : ✘ ✘	9 : ✙ ✙
a : ❁ ❁	b : ❂ ❂	c : ❃ ❃	d : ❄ ❄	e : ❅ ❅	f : ❆ ❆	g : ❇ ❇
h : ❈ ❈	i : ❉ ❉	j : ❊ ❊	k : ❋ ❋	l : ● ●	m : ❍ ❍	n : ■ ■
o : ❏ ❏	p : ❐ ❐	q : ❑ ❑	r : ❒ ❒	s : ▲ ▲	t : ▼ ▼	u : ◆ ◆
v : ❖ ❖	w : ◗ ◗	x : ❘ ❘	y : ❙ ❙	z : ❚ ❚	+ : ☞ ☞	- : ✍ ✍
* : ☛ ☛	’ : ✇ ✇	> : ✞ ✞	< : ✜ ✜	0 : ✐ ✐	/ : ✏ ✏	. : ✎ ✎

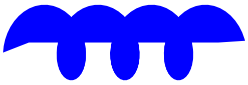
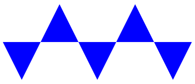
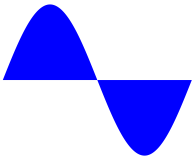
symbolFont=PSTricksDotFont						
A : ✚ ✚	B :	C : ○ ○	D : ◇ ◇	E : ⨂ ⨂	F : ◯ ◯	G : ⯃ ⯃
H : ⬡ ⬡	I : ❙ ❙	J : ⊛ ⊛	K : ✱ ✱	L :	M : ⊕ ⊕	N : ⊗ ⊗
O :	P : ⬠ ⬠	Q :	R :	S : □ □	T : △ △	U :
V :	W :	X : ✕ ✕	Y :	Z :	1 :	2 :
3 :	4 :	5 :	6 :	7 :	8 :	9 :
a : + +	b : ● ●	c : ○ ○	d : ◇ ◇	e : ⨁ ⨁	f : ◯ ◯	g : ⯃ ⯃
h : ⬡ ⬡	i : ❘ ❘	j :	k : ∗ ∗	l : ♦ ♦	m : ⊕ ⊕	n : ⊗ ⊗
o :	p : ⬠ ⬠	q : ⬟ ⬟	r : ■ ■	s : □ □	t : △ △	u : ▲ ▲
v :	w :	x : × ×	y :	z :	+ :	- :
* :	’ :	> :	< :	0 :	/ :	. :

22.4 Les bobines

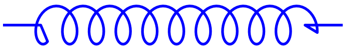
Utilisation du module **pst-coil**

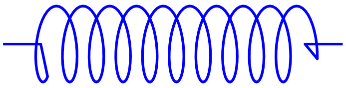
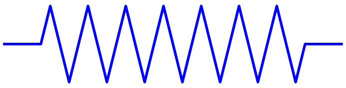
22.4.1 Les 3 types de bobines

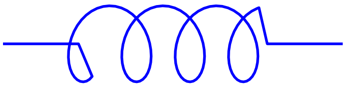
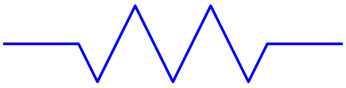
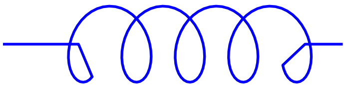
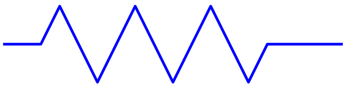
		
\pscoil(0.5,0)(4,0)	**\pszigzag**(0.5,0)(4,0)	**\pssin**(0.5,0)(4,0)

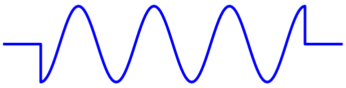
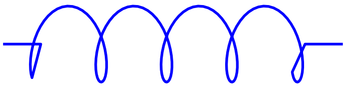
		
\pscoil*(0.5,0)(4,0)	**\pszigzag***(0.5,0)(4,0)	**\pssin***(0.5,0)(4,0)

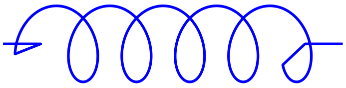
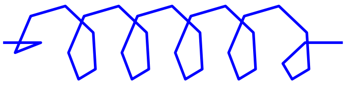
22.4.2 Paramètres des bobines

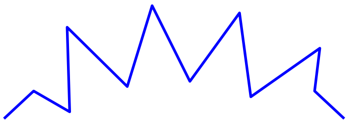
	
\pscoil[coilwidth=0.5cm](0.5,0)(5,0)	\pszigzag[coilwidth=0.5cm](0.5,0)(5,0)
Par défaut : 1cm	

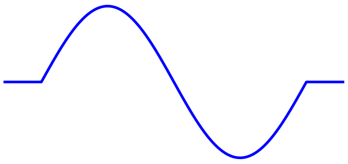
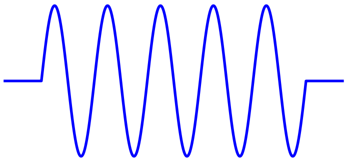
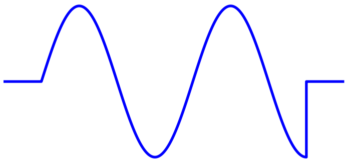
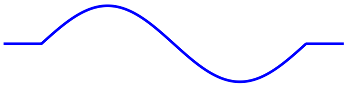
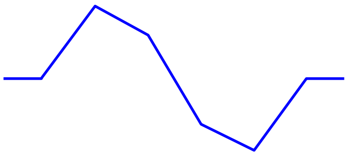
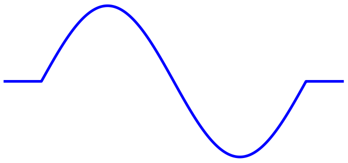
	
\pscoil[coilheight=0.5](0.5,0)(5,0)	\pszigzag[coilheight0.5](0.5,0)(5,0)
Par défaut : 1	

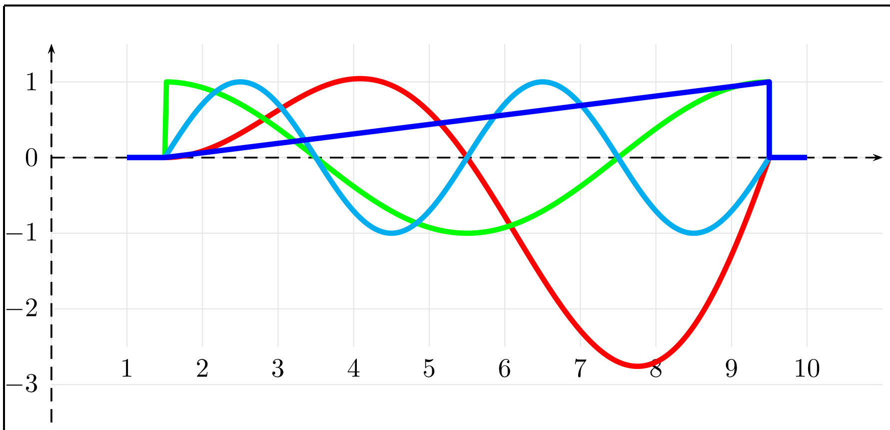
	
\pscoil[coilarm=1](0.5,0)(5,0)	\pszigzag[coilarm=1](0.5,0)(5,0)
	
\pscoil[coilarmA=1](0.5,0)(5,0)	\pszigzag[coilarmB=1](0.5,0)(5,0)
Par défaut : 0.5cm	

	
\pscoil[coilaspect=0](0.5,0)(5,0)	\pscoil[coilaspect=30](0.5,0)(5,0)
Par défaut :45	

	
\pscoil[coilinc=1](0.5,0)(5,0)	\pscoil[coilinc=30](0.5,0)(5,0)
Par défaut : 10	

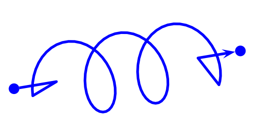
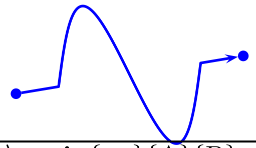
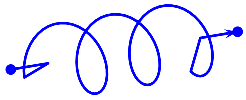
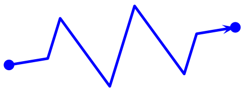
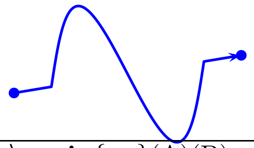
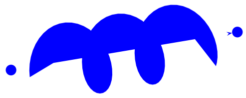
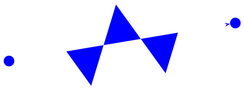
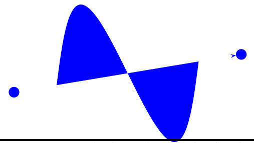
	
\pszigzag[bow=1cm](0.5,0)(5,0)	\pszigzag[bow=-1cm](0.5,0)(5,0)
Par défaut : 0	

	
pssin(0.5,0)(5,0)	\pssin[periods=5(0.5,0)(5,0)
	
\pssin[periods=2cm](0.5,0)(5,0)	\pssin[amplitude=0.5](0.5,0)(5,0)
	
\pssin[ppoints=5](0.5,0)(5,0)	\pssin[ppoints=2000]](0.5,0)(5,0)
Par défaut : periods = 1 , amplitude = 1 , ppoints= 360	



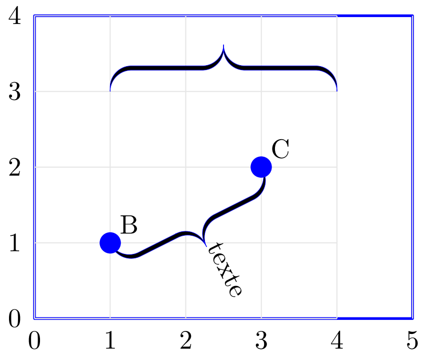
\pssin[linecolor=blue,linewidth=2pt,function=360 div](1,0)(10,0)
\pssin[linecolor=green,linewidth=2pt,function=cos](1,0)(10,0)
\pssin[linecolor=cyan,linewidth=2pt,function=2 mul sin](1,0)(10,0)
\pssin[linecolor=red,linewidth=2pt,function=dup sin mul .01 mul](1,0)(10,0)

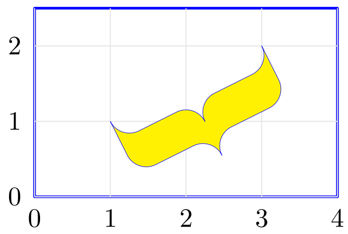
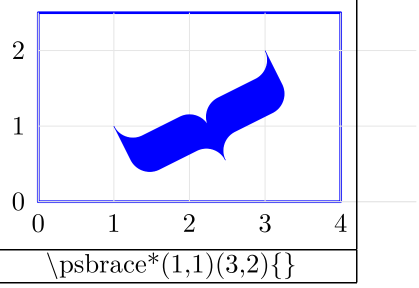
22.4.3 Liaison de nœuds en bobine

\dotnode[dotstyle=*](.5,-.5){A} \dotnode[dotstyle=*](3.5,0){B}		
		
\nccoil{->}{A}{B}	**\nczigzag**{->}{A}{B}	**\ncsin**{->}{A}{B}
		
\pccoil{->}(A)(B)	**\pczigzag** {->}(A)(B)	**\pcsin**{->}(A)(B)
		
\nccoil*{->}{A}{B}	**\nczigzag***{->}{A}{B}	**\ncsin***{->}{A}{B}

22.5 Les accolades

22.5.1 Dans un environnement pspicture

	\pnode(1,1){B} \pnode(3,2){C} **\psbrace**(B)(C){texte} **\psbrace**(4,3)(1,3){}

Rôle de l'astérisque [1]	
	
\psbrace(1,1)(3,2){}	\psbrace*(1,1)(3,2){}

22.5.2 Dans le texte

le noeud A est ici et le noeud B est ici \psbrace(A)(B){texte}
L'accolage n'a pas de dimension

texte

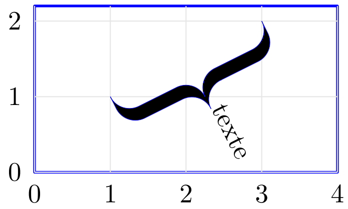
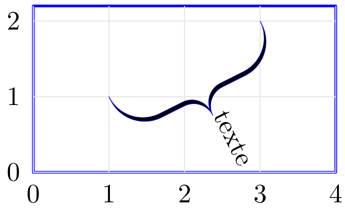
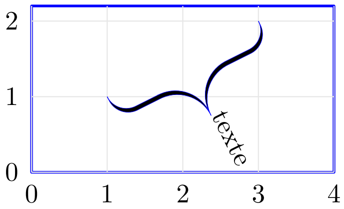
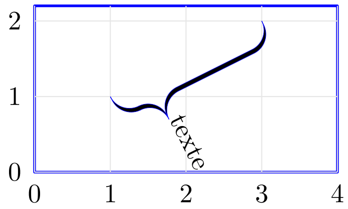
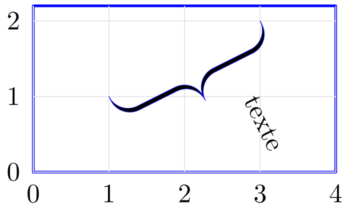
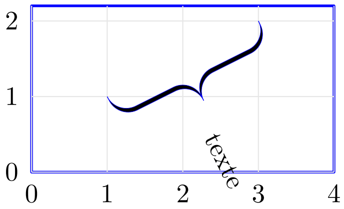
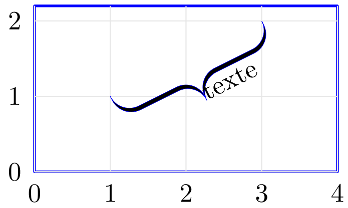
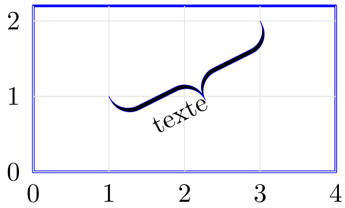
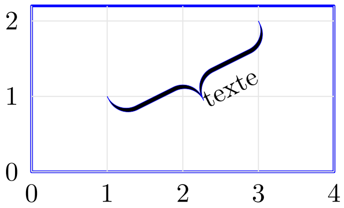
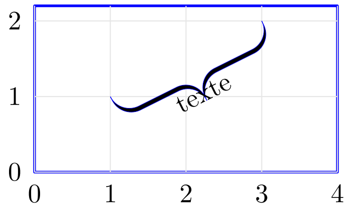
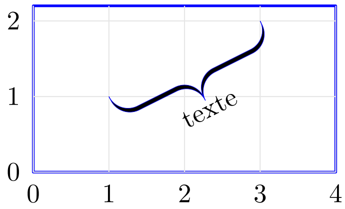
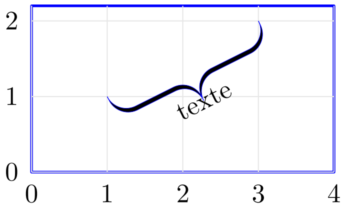
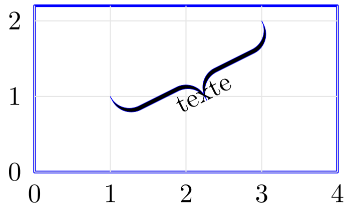
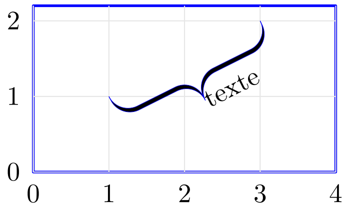
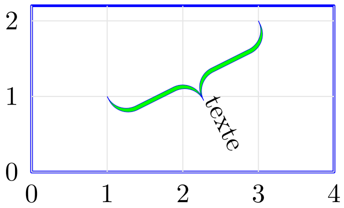
ici, se trouve le noeud A
\vspace{1cm}

ici, se trouve le noeud B \psbrace(A)(B){}

---

[1] braceWidth=.5cm,fillcolor=yellow

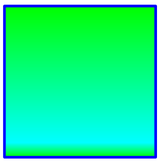
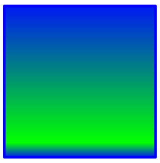
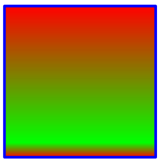
22.5.3 Options

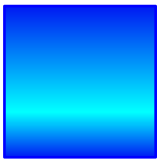
		
braceWidth=5pt	braceWidthInner=.5cm	braceWidthOuter=.5cm
Par défaut : \pslinewidth	Par défaut : 10\pslinewidth	Par défaut : 10\pslinewidth
		
bracePos=.25 Position (%)	nodesepA=5pt décalage horizontal	nodesepB=5pt décalage vertical
Par défaut : .5	Par défaut : 0pt	Par défaut : 0pt
		
rot=90	rot=90,ref = r	rot=90,ref=l
		
rot=90,ref=b	rot=90,ref=t	rot=90,ref=C
		
rot=90,ref=B	rot=90,ref=lC	fillcolor=green

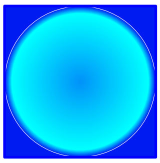
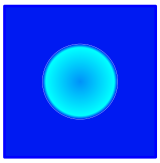
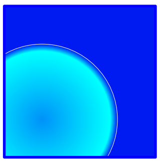
23 Des remplissages spéciaux

23.1 Des gradients de couleurs

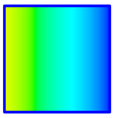
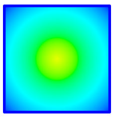
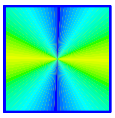
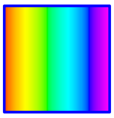
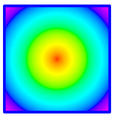
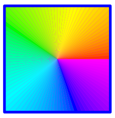
23.1.1 Module pst-grad [1] [11]

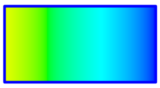
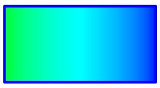
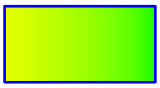
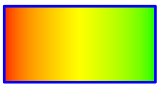
\psframe[fillstyle=gradient](0.5,.5)(2.5,2.5)			
			
Par défaut	gradbegin=green	gradend=green	gradbegin=red gradend=green

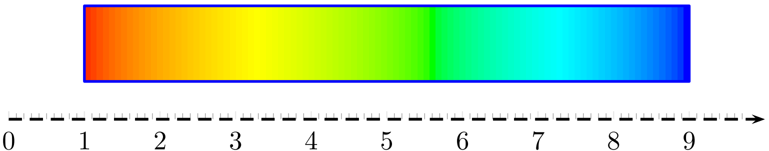
			
gradlines=5	gradmidpoint=0.7	gradangle=45	gradangle=90
Par défaut : 500	Par défaut : 0.9	Par défaut : 0	

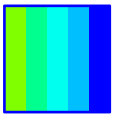
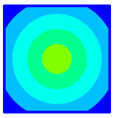
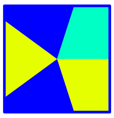
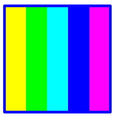
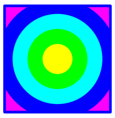
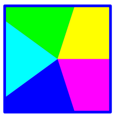
\psframe[fillstyle=gradient,GradientCircle=true](0.5,.5)(2.5,2.5)			
			
	GradientScale=.5	GradientScale=2	GradientPos={(1,1)}

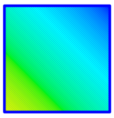
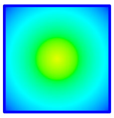
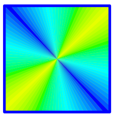
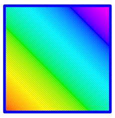
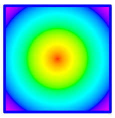
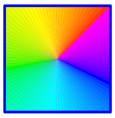
23.1.2 Module pst-slpe [20]

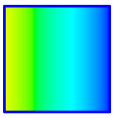
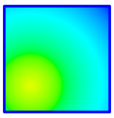
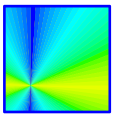
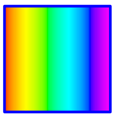
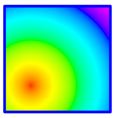
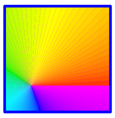
\psframe[fillstyle=slope](0.5,0.5)(2.5,2.5)					
					
slope [20]	ccslope [20]	radslope [20]	slopes [20]	ccslopes [20]	radslopes [20]

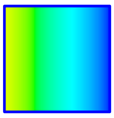
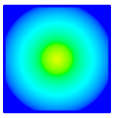
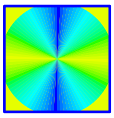
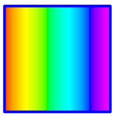
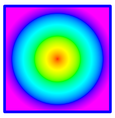
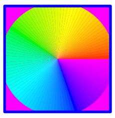
\psframe[fillstyle=slope](0.5,0.5)(2.5,1.5)			
			
Par défaut	slopebegin=green	slopeend=green	slopebegin=red slopeend=green

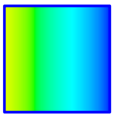
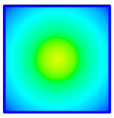
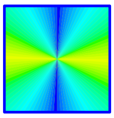
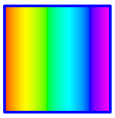
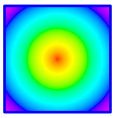
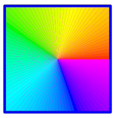

\psframe[fillstyle=slopes,slopecolors= 0 1 0 0 4 0 1 0 7 0 0 1 3](1,.5)(9,2.5)
Position couleur en RGB nombre de couleurs

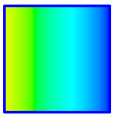
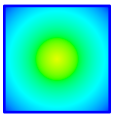
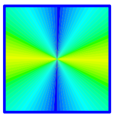
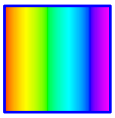
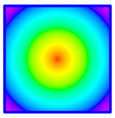
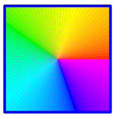
\psframe[fillstyle=slope,slopesteps=5](0.3,0.3)(1.7,1.7) (Par défaut : 100)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

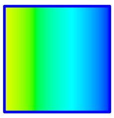
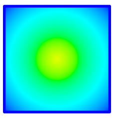
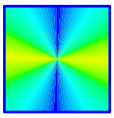
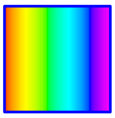
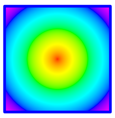
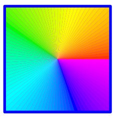
\psframe[fillstyle=slope,slopeangle=45](0.5,0.5)(2.5,2.5) (Par défaut0)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

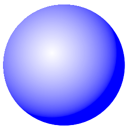
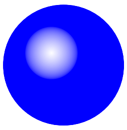
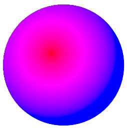
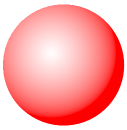
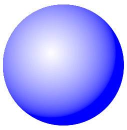
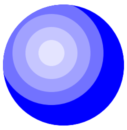
\psframe[fillstyle=slope,slopecenter= .25 .25](0.5,0.5)(2.5,2.5) (Par défaut.5 .5)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

\psframe[fillstyle=slope,sloperadius =.75](0.5,0.5)(2.5,2.5) (Par défaut0.5cm)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

\psframe[fading, fillstyle=slope](0.5,0.5)(2.5,2.5)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

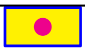
\psframe[fading, startfading=0.5, fillstyle=slope](0.5,0.5)(2.5,2.5)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

\psframe[fading, endfading=0.5, fillstyle=slope](0.5,0.5)(2.5,2.5)					
					
slope	ccslope	radslope	slopes	ccslopes	radslopes

\psBall [option](1,1){blue}{.8}					
					
sans option	sloperadius=10pt	slopebegin=red	slopeend=red	fading	slopesteps=5

23.2 Remplissage par des motifs

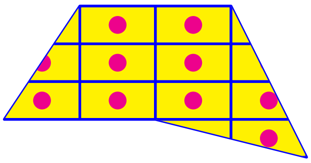
Utilisation du module **pst-fill**

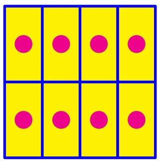
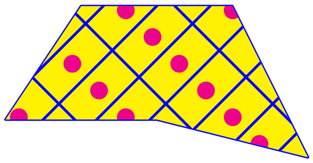
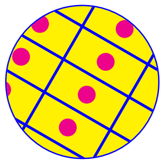
Création du motif : 

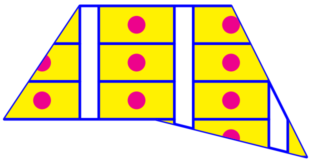
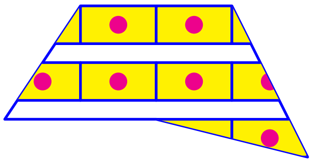
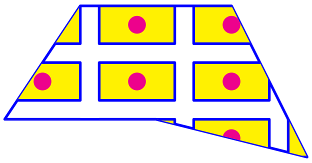
```
\newcommand{\MonMotif}{
\begin{pspicture}(1,.5)
\psframe[dimen=middle,fillcolor=yellow,fillstyle=solid,linecolor=blue](1,.5)
\pscircle[dimen=middle,fillcolor=magenta,fillstyle=solid,linecolor=magenta](.5,.25){.1}
\end{pspicture} }
```

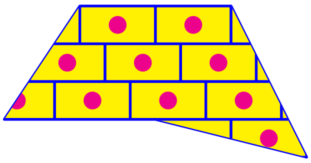
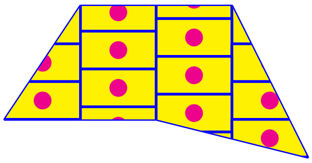
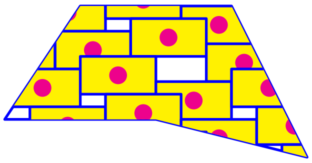
Utilisation du motif : **\psboxfill**{\MonMotif}

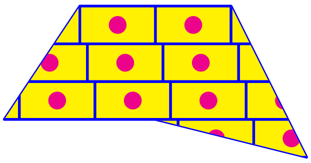
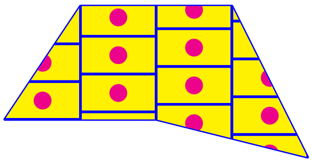
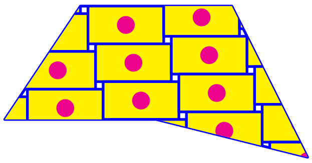
```
\pspolygon[fillstyle=boxfill](0,.5)(1,2)(3,2)(4,0)(2,.5)
```

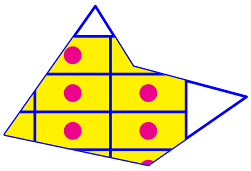
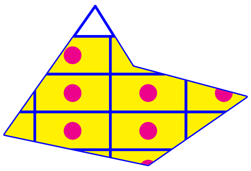
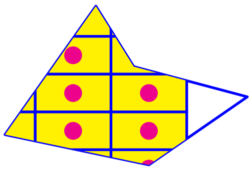
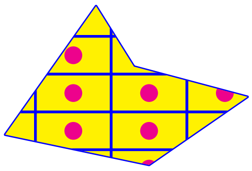


		
fillangle=90	fillangle=45	fillangle=-30
Par défaut : 0		

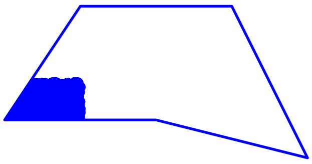
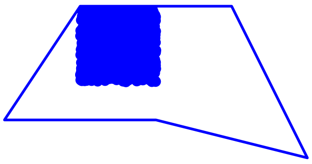
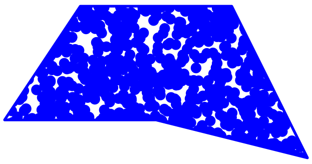
		
fillsepx=.25cm	fillsepy=.25cm	fillsep=.25cm

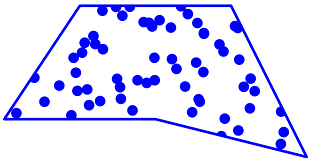
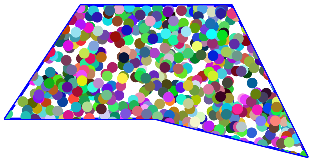
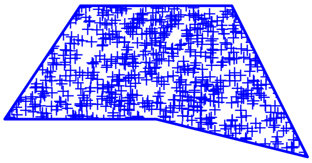
		
fillcyclex=3	fillcycley=3	fillcycle=3
3 correspond à 1/3, Par défaut : 0		

		
fillmovex=.1	fillmovey=.1	fillmove=.1
.1 correspond à 0,1 cm , Par défaut : 0		

\pspolygon[fillstyle=boxfill](0.6,.7)(1.8,2.4)(2.3,.6)(4,1.2)(2.5,.3)			
			
	fillloopaddx=1	fillloopaddy=1	fillloopadd=1
Par défaut : 0			

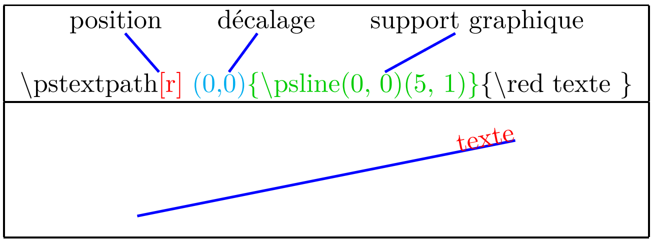
23.3 Remplissage par des points aléatoires

\psRandom{\pspolygon(0,.5)(1,2)(3,2)(4,0)(2,.5)}		
		
\psRandom{\pspolygon …}	\psRandom(1,1)(2,2){…}	\psRandom(0,0)(4,2){…}

\psRandom[options](0,0)(4,2){\pspolygon(0,.5)(1,2)(3,2)(4,0)(2,.5)}		
		
randomPoints=100	color	dotstyle=+
Par défaut : 1000		

24 Effets spéciaux avec du texte

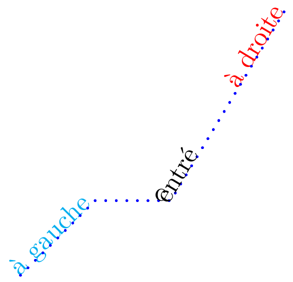
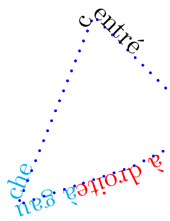
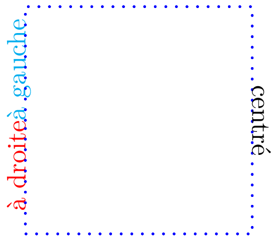
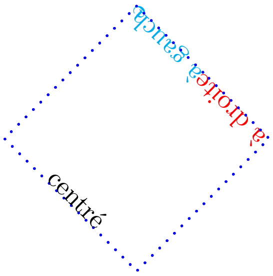
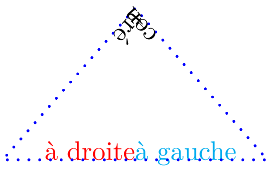
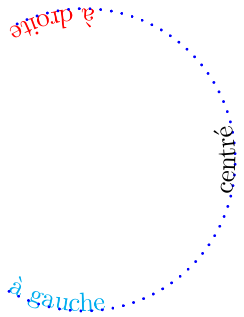
24.1 pstextpath

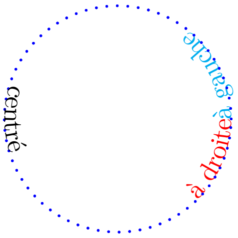
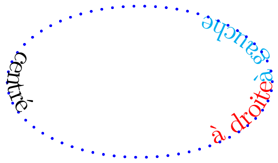
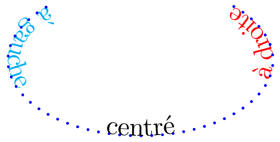
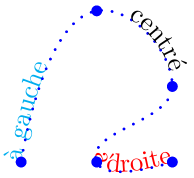
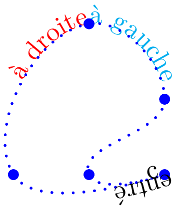
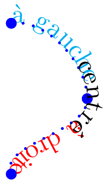
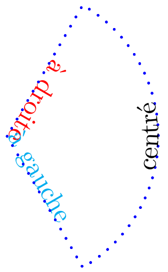
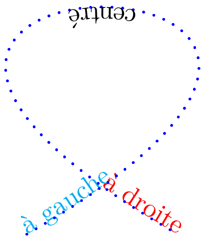
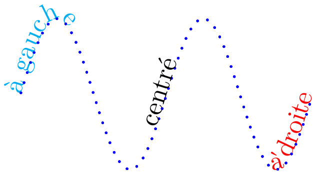


```
\pstextpath[r] (0,0){\psline(0, 0)(5, 1)}{\red texte }
```

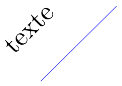
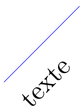
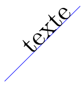
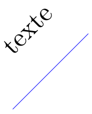
24.1.1 Positionnement sur différents objets graphiques

```
\pstextpath[r] (0,0){\psline(0, 0)(1, 1)(2, 1)(3.5, 3.5)}{\red à droite}
\pstextpath[l] (0,0){\psline(0, 0)(1, 1)(2, 1)(3.5, 3.5)}{\cyan à gauche}
\pstextpath[c] (0,0){\psline(0, 0)(1, 1)(2, 1)(3.5, 3.5)}{ centré }
```

		
\psline	\pspolygon	\psframe
		
\psdiamond	\pstriangle	\psarc

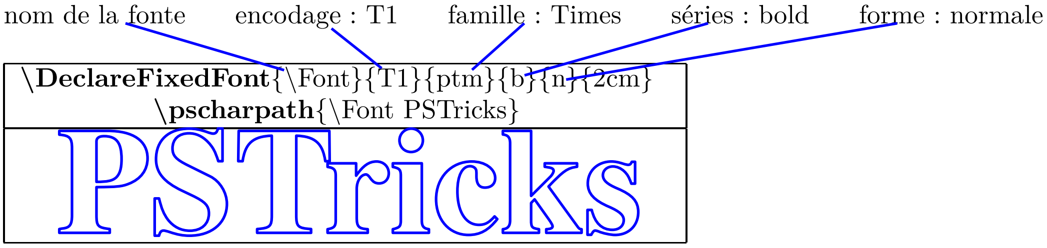
		
\pscircle	\psellipse	\psellipticarc
		
\pscurve	\psccurve	\psecurve
		
\pswedge	\psbezier	\psplot[algebraic]{0}{12.56}{sin(x)}

24.1.2 Décalage

\pstextpath[l](0,.5){\psline(0, 0)(1, 1)}{texte}			
			
(0,0.5)	(0,-0.5)	(0.5,0)	(0.5,0.5)
Par défaut : (0,\TPoffset) \TPoffset= -0.7ex.			

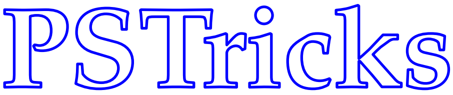
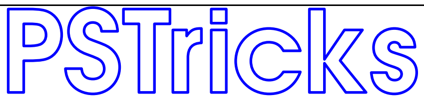
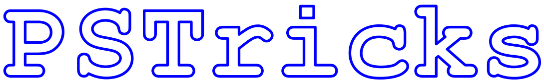
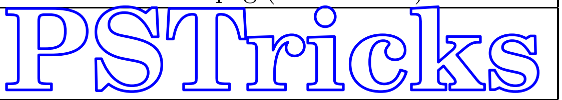
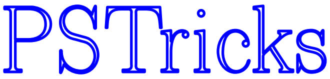
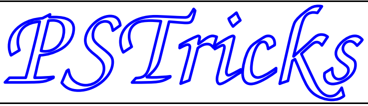
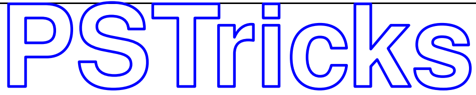
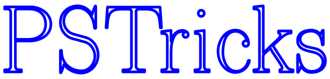
24.2 pscharpath

\DeclareFixedFont{\[nom]}{\encodage} {\famille}{\Séries}{\forme}{taille}

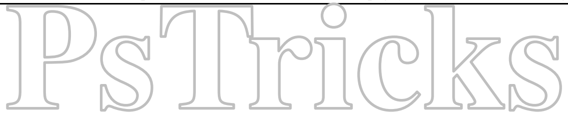
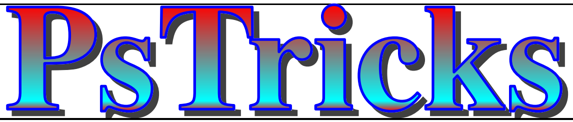
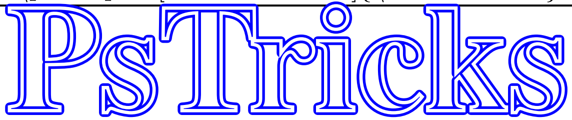


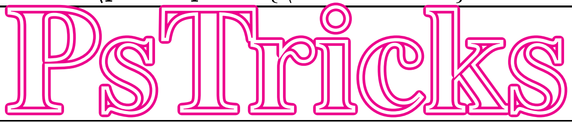
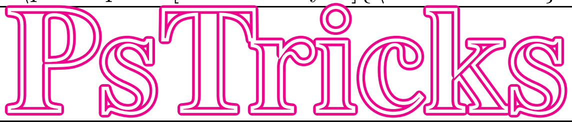
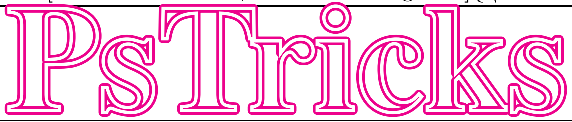
```
\DeclareFixedFont{\Font}{T1}{ptm}{b}{n}{2cm}
\pscharpath{\Font PSTricks}
```

24.2.1 Quelques familles de fonte

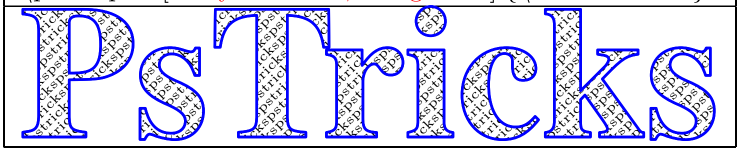
	
famille : ppl (Palatino)	famille : pag (AvantGarde)
	
famille : pcr (Courier)	famille : pnc (NewCenturySchoolbook)
	
famille : psy (Symbol)	famille : pzc (ZapfChancery)
	
famille : phv (Helvetica)	famille : pzd (ZapfDingbats)

24.2.2 Mise en forme

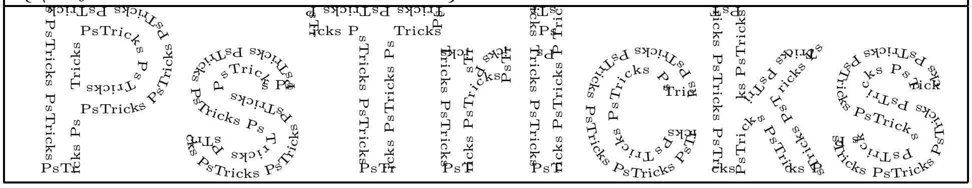
\pscharpath[linecolor=lightgray]{\Font PsTricks}

\pscharpath[fillstyle=gradient,gradbegin=red,gradend=cyan,shadow=true]{\Font PsTricks}

\pscharpath[doubleline=true]{\Font PsTricks}

\pscharpath[shadow=true]{\Font PsTricks}


\pscharpath avec astérisque
\pscharpath* {\Font PsTricks}

\pscharpath*[linecolor=cyan]{\Font PsTricks}

\pscharpath[doubleline=true,linecolor=magenta]{\Font PsTricks}


24.2.3 Effets spéciaux

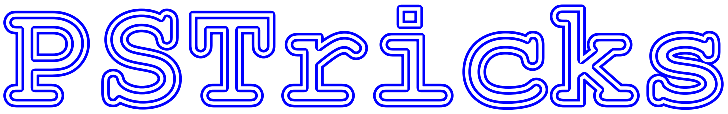
\psboxfill{\tiny pstricks} \pscharpath[fillstyle=boxfill,fillangle=45] {\Font PsTricks}


```
\DeclareFixedFont{\Font}{T1}{phv}{b}{n}{2cm}
\pstextpath(0,0){\pscharpath*[linestyle=none]{\Font PsTricks}}
{\tiny PsTricks PsTricks PsTricks ...}
```



24.3 pscharclip

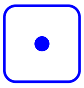
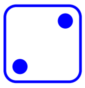
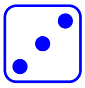
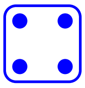
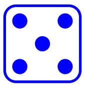
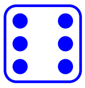
```
\DeclareFixedFont{\Font}{T1}{pcr}{b}{n}{2cm}
\begin{pspicture*}(12,3)
\begin{pscharclip}[doubleline=true]{
\rput(6,1.5){\Font PSTricks}
}
\end{pscharclip}
\end{pspicture*}
```

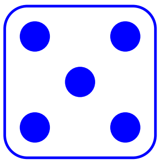


==

25 Objets divers

25.1 Des dés

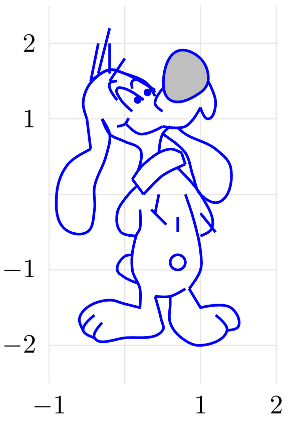
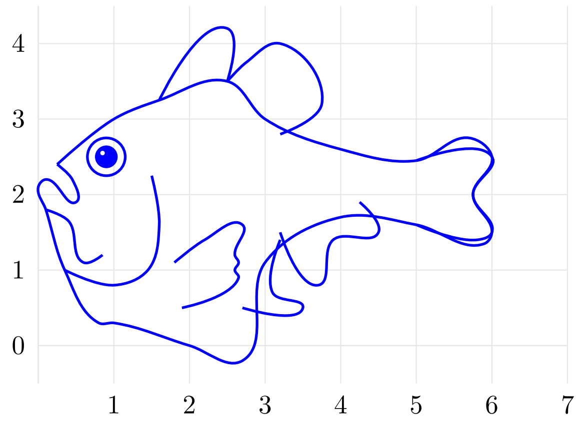
					
\psdice{1}	\psdice{2}	\psdice{3}	\psdice{4}	\psdice{5}	\psdice{6}

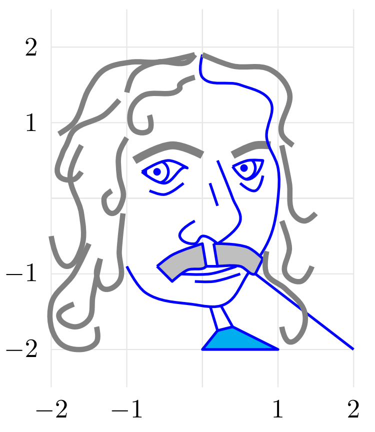

\psdice[unit=2]{5}

25.2 Dessins humouristiques

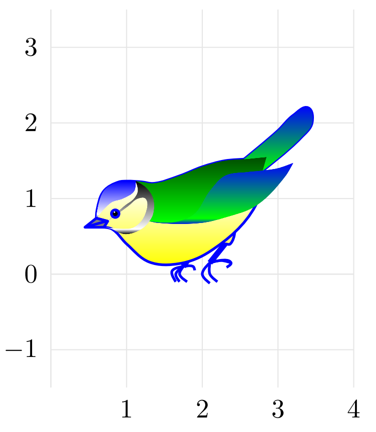
utilisation du module « **pst-fun** »

25.2.1 Commandes brutes

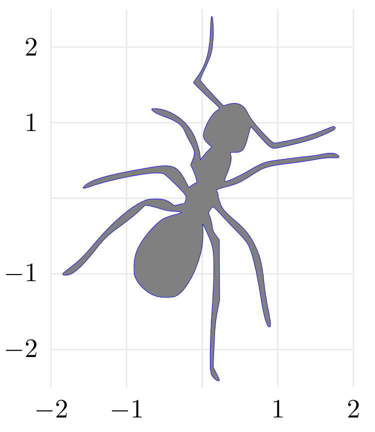
	
\psBill	\psFish



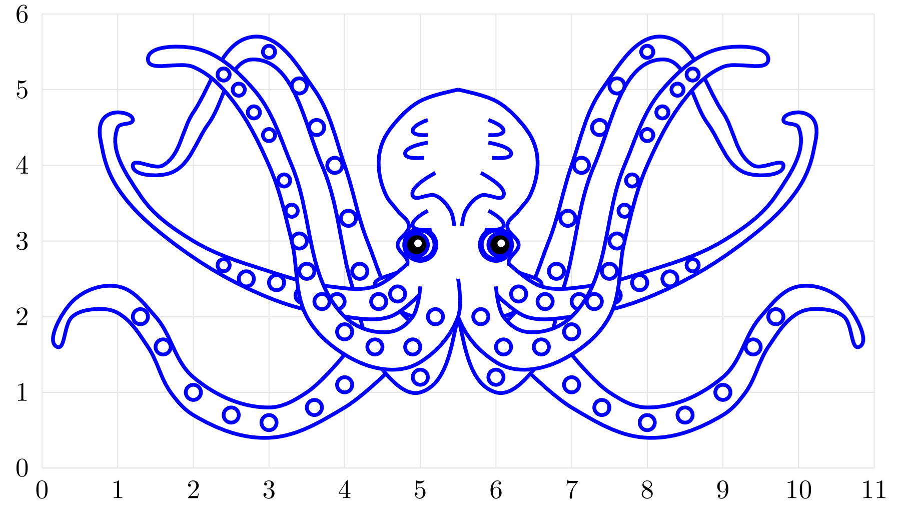
\psLouisXIII



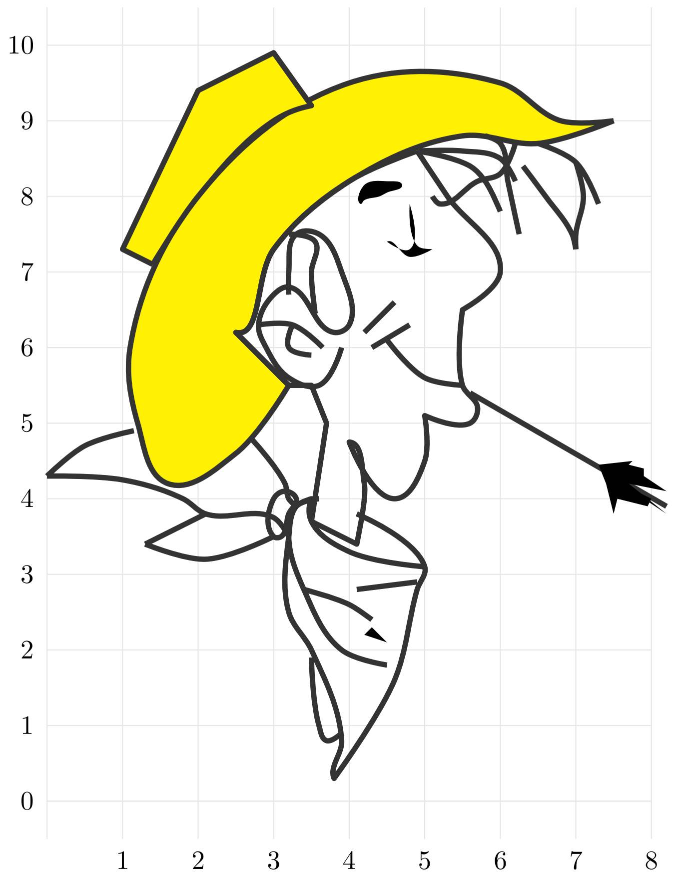
\psBird



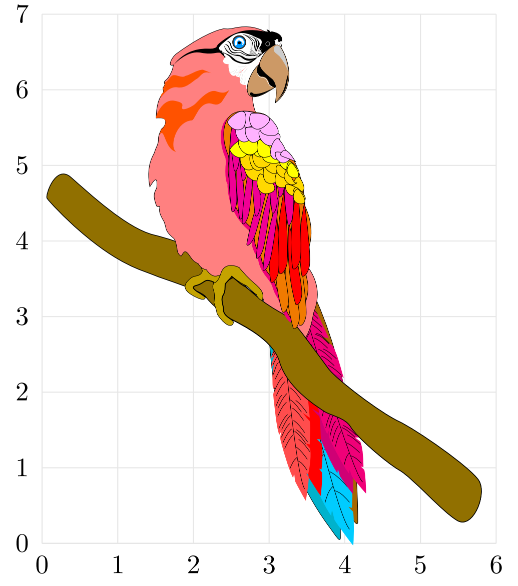
\psAnt



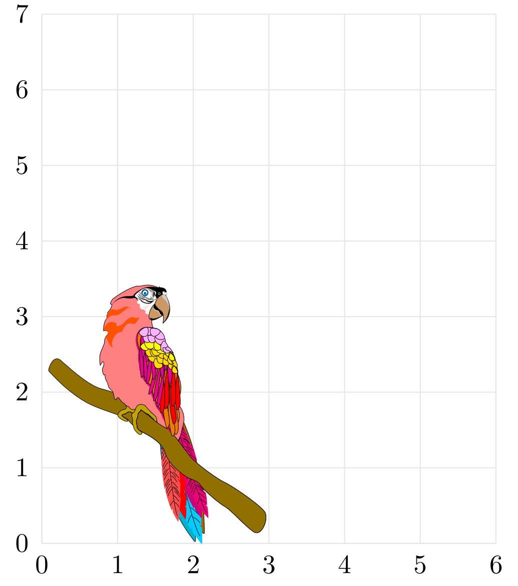
\psPulpo



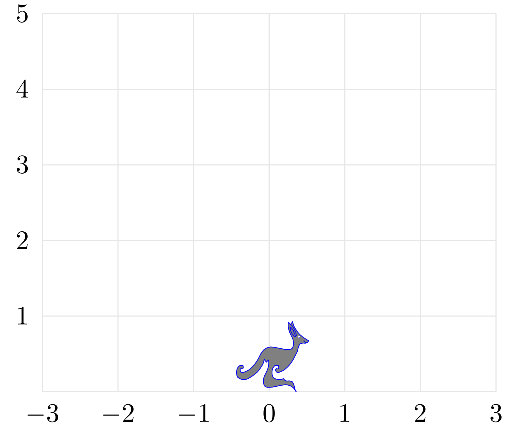
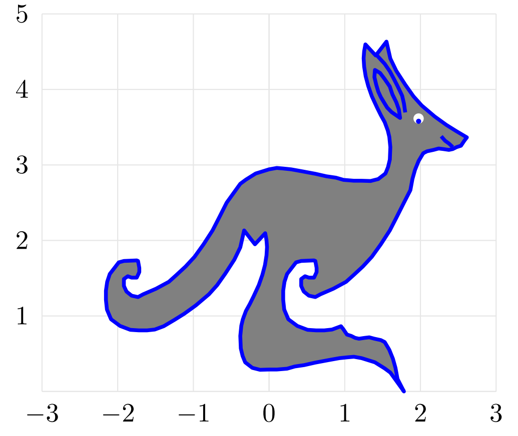
\psLuke

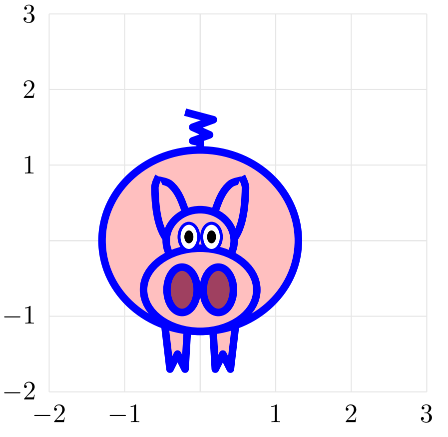
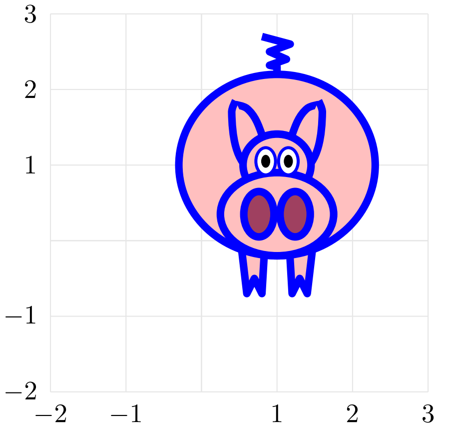


\psParrot{1}

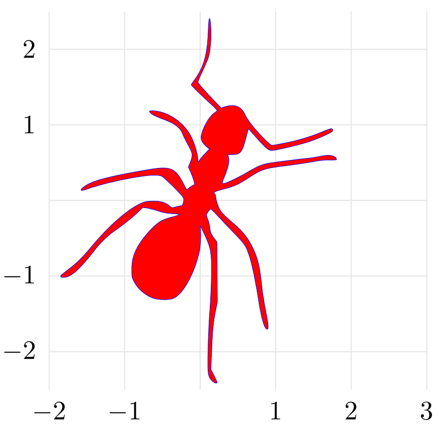
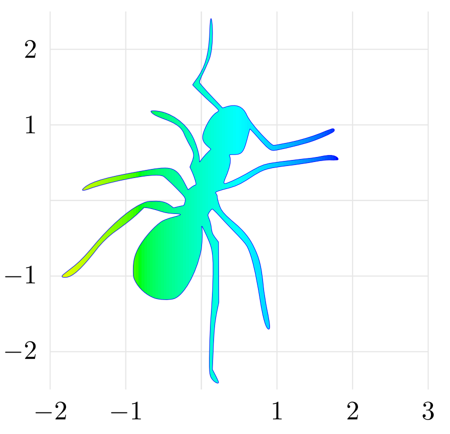


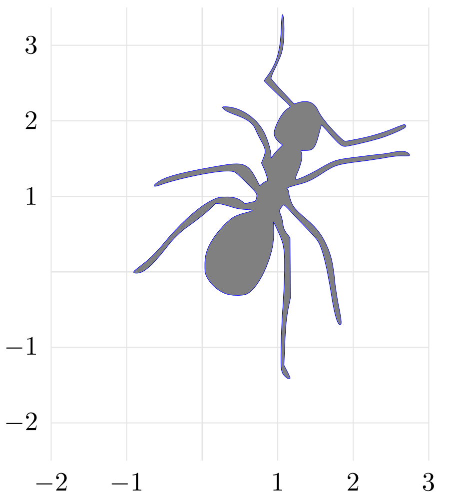
\psParrot{.5}

	
\psKangaroo{1}	**\psKangaroo**{5}

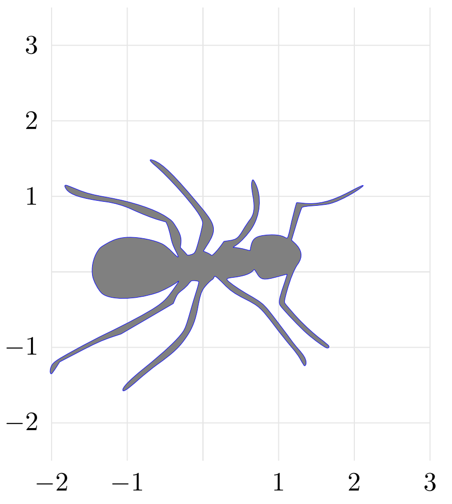
	
\psPig(0,0)	**\psPig**(1,1)

25.2.2 options

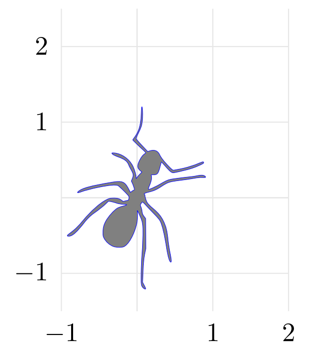
	
\psAnt[fillcolor=red]	\psAnt[fillstyle=slope]



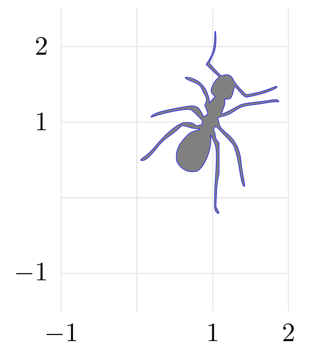
\rput (1,1){\psAnt}



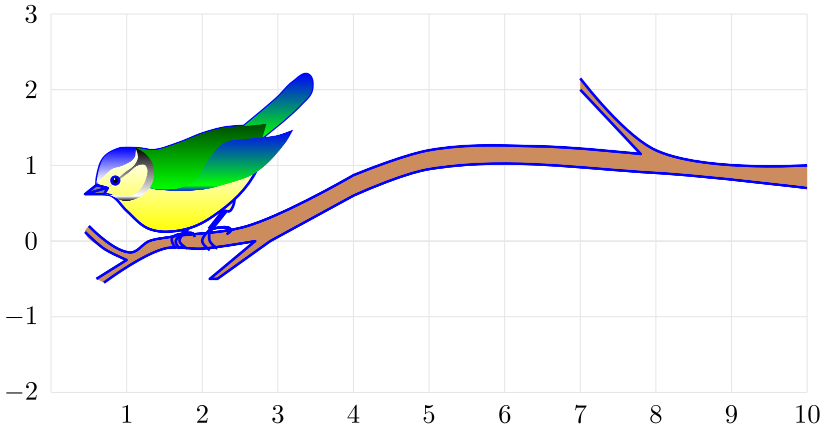
\rput{-60}{\psAnt}



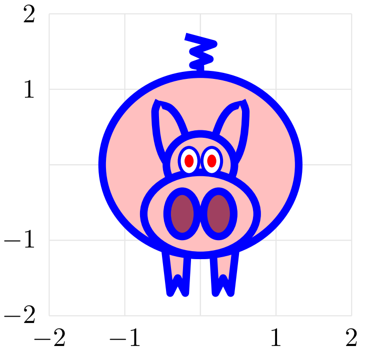
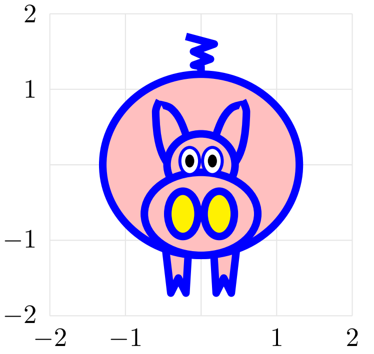
\psscalebox{0.5}{\psAnt}



\rput{**\psscalebox**{0.5}{\psAnt} }



\psBird[Branch]

	
\psPig[eyeColor=red](0,0)	\psPig[noseColor=yellow](0,0)

26 Créer un graphe

Utilisation du module **pst-plot**

26.1 Environnement

26.1.1 Dans un environnement classique

- Axes : Macro **psaxes**
- Quadrillages : Macro **psgrid**

26.1.2 Dans un environnement psgraph

Deux syntaxes :

psgraph[Options] {flèches}(xOrig,yOrig)(xMin,yMin)(xMax,yMax){largeur graphe} {hauteur graphe} **endpsgraph**

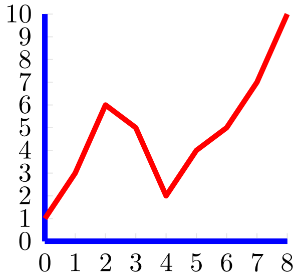
ou

begin{psgraph} [Options]{flèches}(xOrig,yOrig)(xMin,yMin)(xMax,yMax) {largeur graphe}{hauteur graphe} . . . **end{psgraph}**

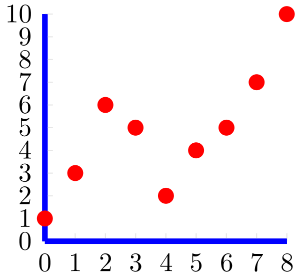
Remarque :

- L'indication de la largeur et de la hauteur du graphe permettent la mise à l'échelle automatique
- Si hauteur graphe = ! , les deux axes ont la même unité

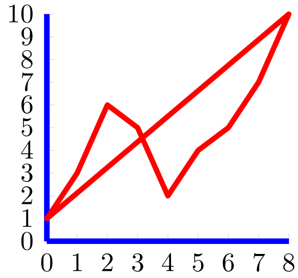
26.2 Type de tracé



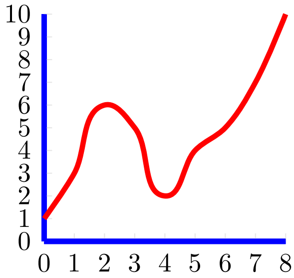
Par défaut : plotstyle= line [18]



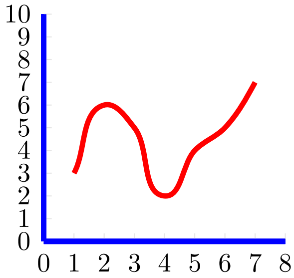
plotstyle= dots [18]



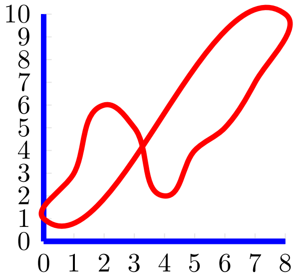
plotstyle= polygon [18]



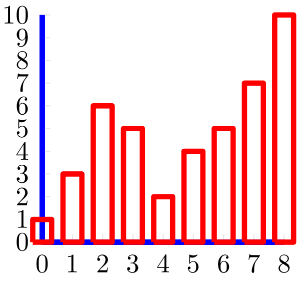
plotstyle= curve [18]



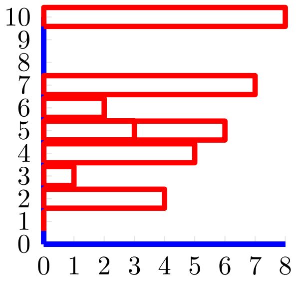
plotstyle=ecurve [18]



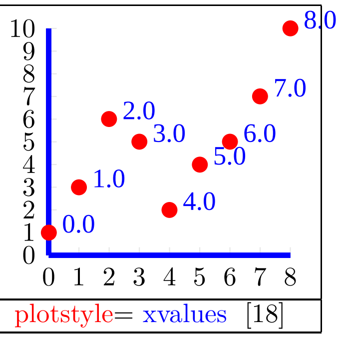
plotstyle= ccurve [18]



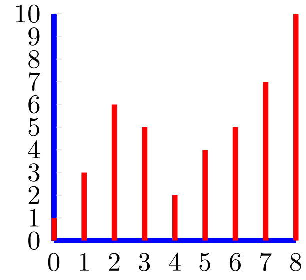
plotstyle= bar [18]



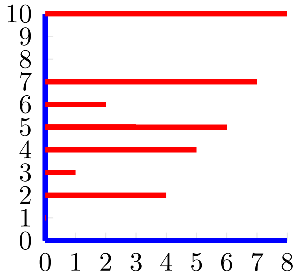
plotstyle= ybar [18]



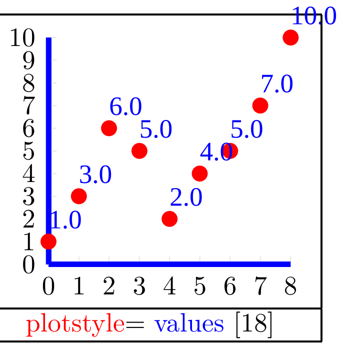
plotstyle= xvalues [18]



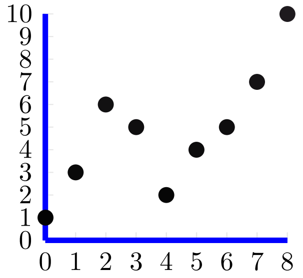
plotstyle= LineToXAxis [18]



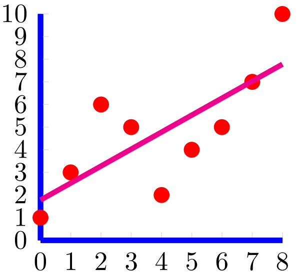
plotstyle= LineToYAxis [18]



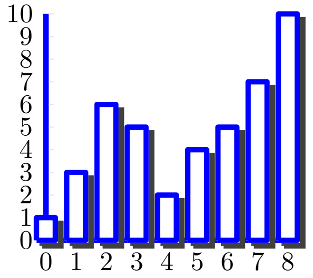
plotstyle= values [18]



Hue=100,plotstyle= colordots [18]



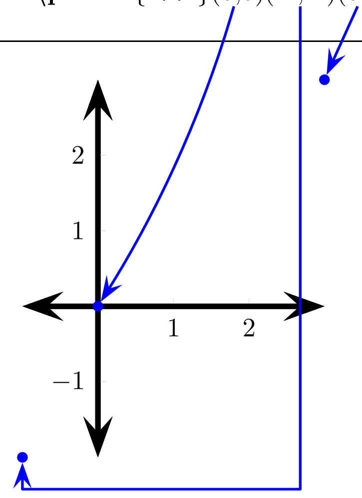
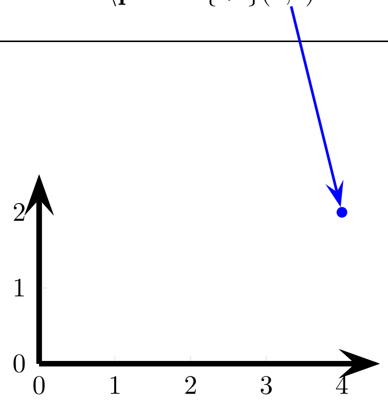
plotstyle= LSM [18]



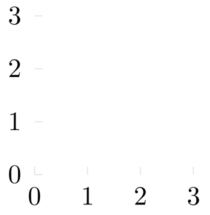
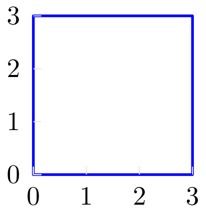
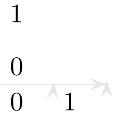
shadow=true,plotstyle=bar [18]

26.3 Les axes

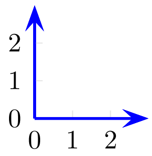
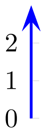
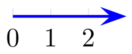
26.3.1 Dimensionnement

\psaxes{<->}(0,0)(-1,-2)(3,3)	**\psaxes**{->}(4,2)
	

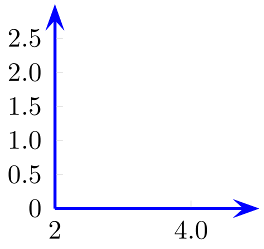
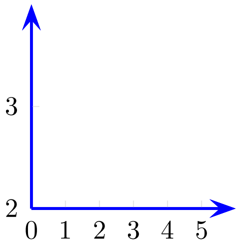
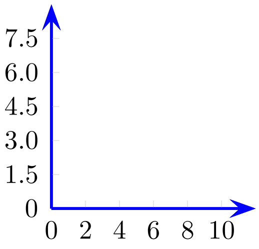
26.3.2 Types d'axes

		
axesstyle=none	axesstyle=frame	axesstyle=polar
Par défaut : axesstyle=axes		

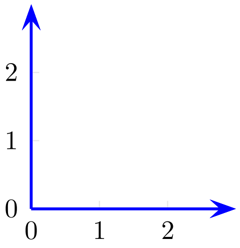
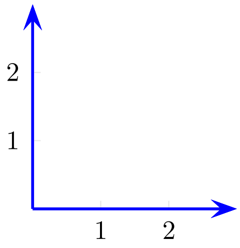
26.3.3 Choix des axes

			
xyAxes=true	xyAxes=false	xAxis=false	yAxis=false
Par défaut : xAxis = yAxis = xyAxes = true			

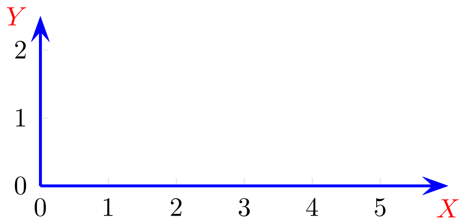
26.3.4 Espacement des graduations

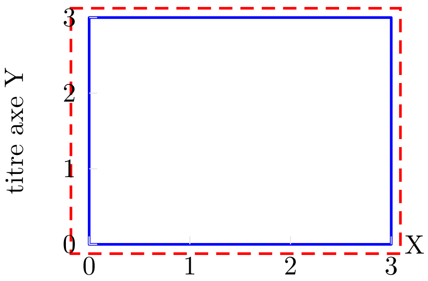
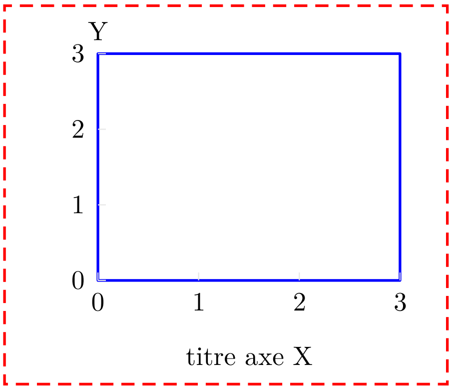
		
Ox=2 Dx=2.0 Dy=0.5	Oy=2 dx=.5 dy=1.5	dx=.5 Dx=2 dy=.5 Dy= 1.5
Par défaut : Ox = Oy= 0 Dx= Dy = 1		

26.3.5 Origine

	
showorigin=true (Par défaut)	showorigin=false

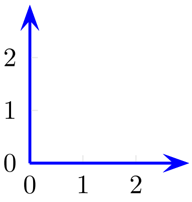
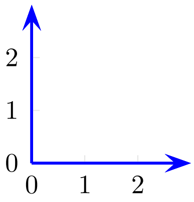
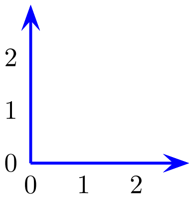
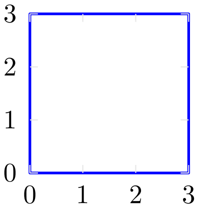
26.3.6 Titres des axes

\psaxes{->}(0,0)(6,5)[X,-90][Y,180]


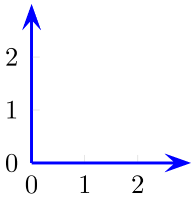
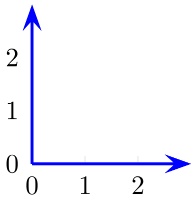
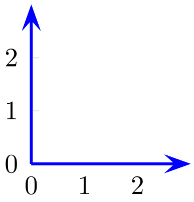
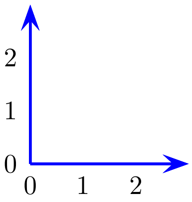
\psset{llx=0,lly=0,urx=0,ury=0,xAxisLabel=X,yAxisLabel=titre axe Y,yAxisLabelPos={-1cm,c}}	
	
xAxisLabel=X yAxisLabel=titre axe Y llx=0 lly=0 urx=0 ury=0 yAxisLabelPos={-1cm,c}	xAxisLabel=titre axe X yAxisLabel= Y llx=-1cm lly=-1.25cm urx=.5cm ury=.5cm xAxisLabelPos={c,-1cm}

26.4 Marques de graduations

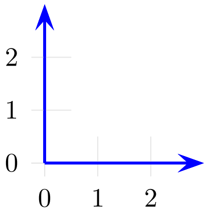
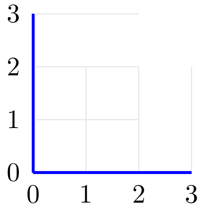
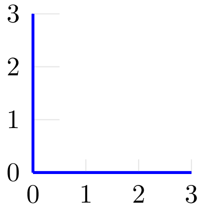
26.4.1 Style des marques de graduation

			
tickstyle=full (Par défaut)	tickstyle=top	tickstyle=bottom	tickstyle=inner axesstyle=frame

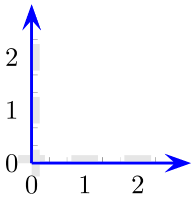
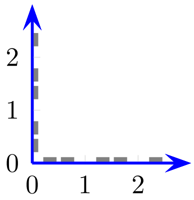
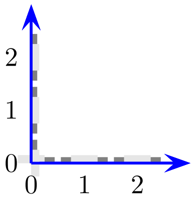
26.4.2 Présence des marques de graduation

			
ticks=all (Par défaut)	ticks=x	ticks=y	ticks=none

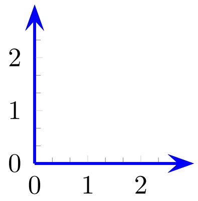
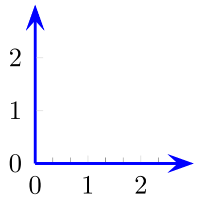
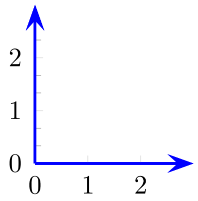
26.4.3 Taille des graduations

		
ticksize=5pt 10pt	xticksize=2	xticksize=5pt 0pt
	yticksize=2	yticksize=10pt 0pt
Par défaut : ticksize = xticksize = yticksize = -4pt 4pt		

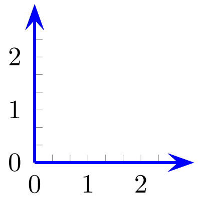
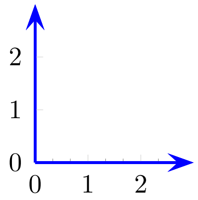
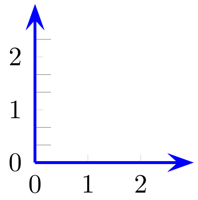
26.4.4 Épaisseur des graduations

		
tickwidth=10pt	subtickwidth=5pt	tickwidth=1em subtickwidth=1ex
Par défaut : tickwidth = subtickwidth = 0.5\pslinewidth		

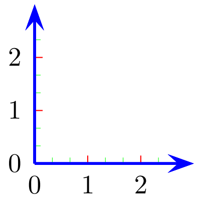
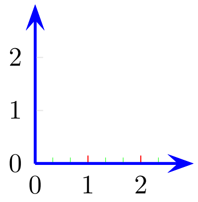
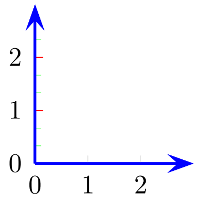
26.4.5 Nombre de graduations secondaires

		
subticks=2	xsubticks=2	ysubticks=2
Par défautsubticks = xsubticks = ysubticks = 0		

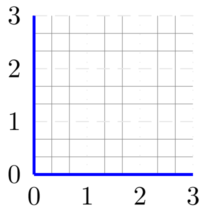
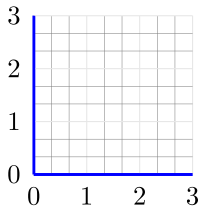
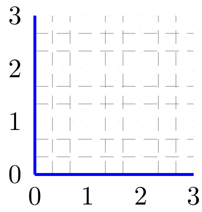
26.4.6 Tailles des marques de graduation secondaires / principales

		
subticksize=1	xsubticksize=.5	ysubticksize=2
Par défaut : subticksize = xsubticksize = subticksize = 0.75		

26.4.7 Couleurs des marques de graduation

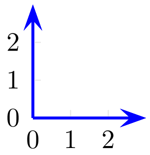
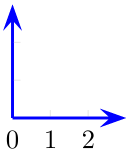
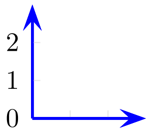
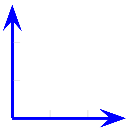
		
tickcolor=red subtickcolor=green	xtickcolor=red xsubtickcolor=green	ytickcolor=red ysubtickcolor=green
Par défaut : tickcolor = xtickcolor = ytickcolor = black subtickcolor = xsubtickcolor = ysubtickcolor = darkgray		

26.4.8 Style des marques de graduation

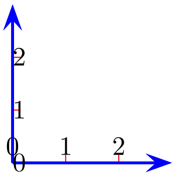
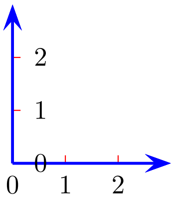
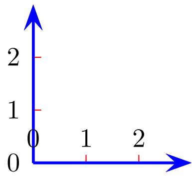
		
yticklinestyle=dashed xticklinestyle=dotted	xsubticklinestyle=solid ysubticklinestyle=none	ticklinestyle= dotted subticklinestyle=dashed
Par défaut : ticklinestyle = xticklinestyle = yticklinestyle = solid subticklinestyle = xsubticklinestyle = ysubticklinestyle = solid		
Option : solid/dashed/dotted/none		

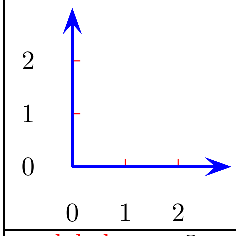
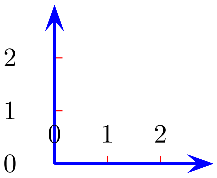
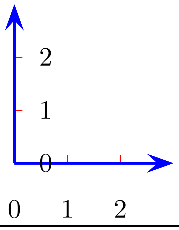
26.5 Étiquettes de graduation

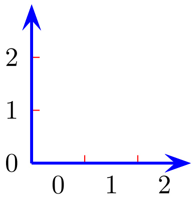
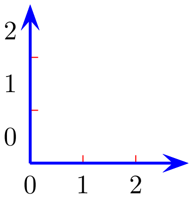
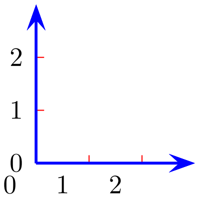
26.5.1 Étiquettes

			
labels= all (Par défaut)	labels=x	labels=y	labels=none

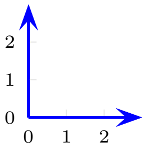
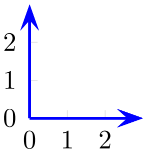
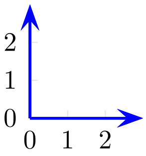
26.6 Position des étiquettes

		
xlabelPos=axis ylabelPos=axis	xlabelPos=bottom (Par défaut) ylabelPos=right	xlabelPos=top ylabelPos=left (Par défaut)

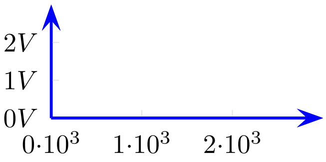
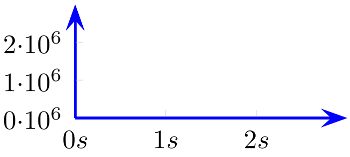
		
labelsep= .5cm	xlabelsep= -.5cm ylabelsep= .5cm	xlabelsep= .5cm ylabelsep=-.5cm
Par défaut : labelsep = 5pt, xlabelsep = 5pt, ylabelsep =5pt		

		
xlabelOffset=0.5	ylabelOffset=0.5	xlabelOffset= -0.5
Par défaut : xlabelOffset =0 , xlabelOffset = 0		

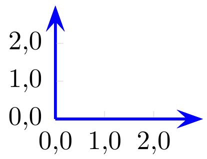
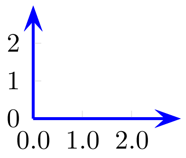
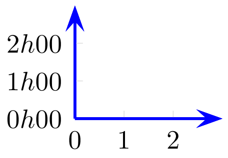
26.6.1 Taille des étiquettes

		
labelFontSize=\scriptstyle	xlabelFontSize=\footnotesize	ylabelFontSize=\small

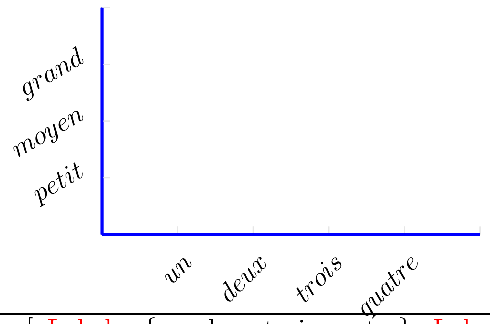
26.6.2 Étiquette avec extension

	
xlabelFactor=\cdot 10^3 ylabelFactor= V	xlabelFactor= s ylabelFactor=$\cdot 10^6$

26.6.3 Les décimales dans les étiquettes

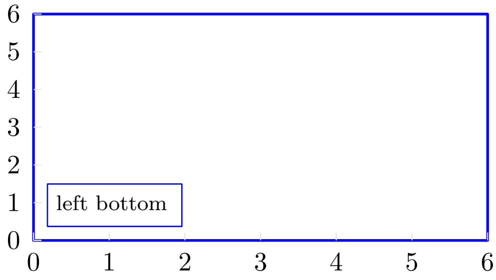
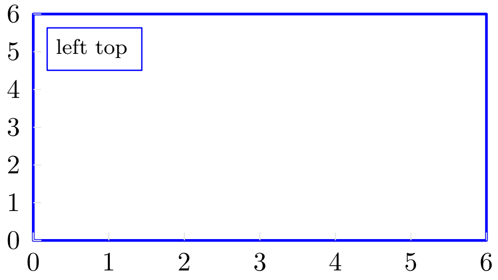
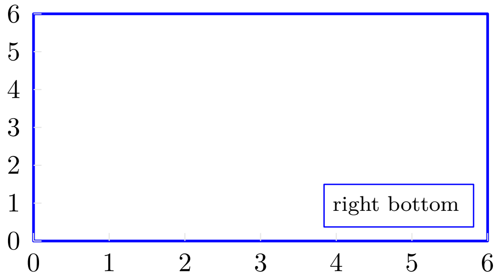
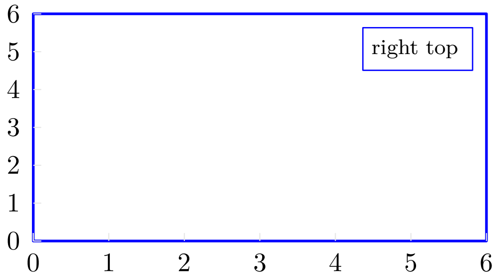
		
comma=true xyDecimals=1	comma= false (Par défaut) xDecimals=1	decimalSeparator=h yDecimals=2

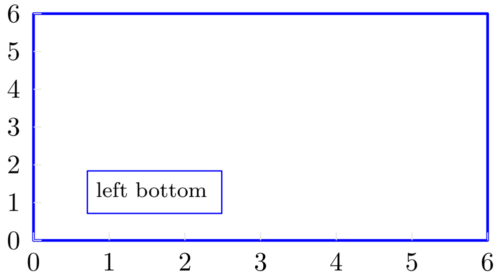
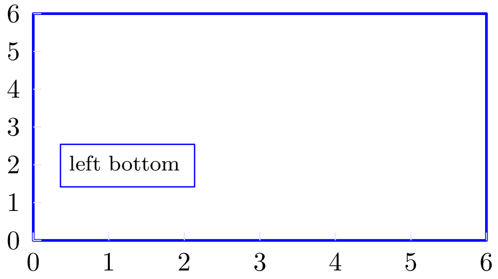
26.6.4 Liste comme étiquettes de graduations


\psaxes[xLabels={,un,deux,trois,quatre},xLabelsRot=45, yLabels={,petit,moyen,grand},yLabelsRot=30](5,4)

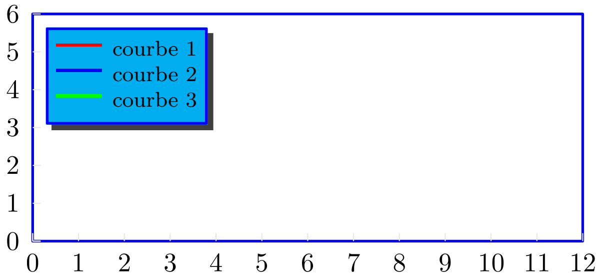
26.7 Légende

26.7.1 Position de la légende

	
\pslegend[lb]{left bottom}	**\pslegend**[lt]{left top}
	
\pslegend[rb]{right bottom}	**\pslegend**[rt]{right top} (Par défaut)

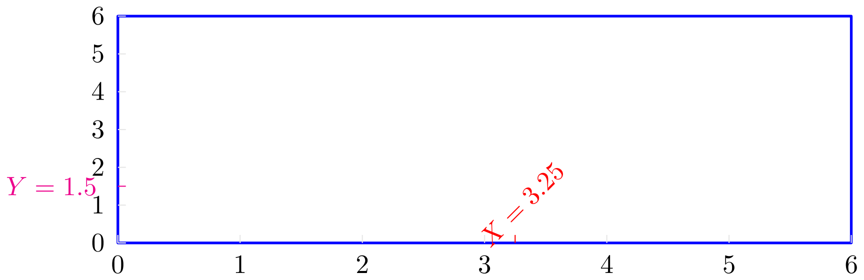
	
\pslegend[lb](20,10){left bottom}	\pslegend[lb](10,20){left bottom}

26.7.2 Aspect de la légende


\newpsstyle{legendstyle} {fillstyle=solid,fillcolor=cyan,shadow=true} \pslegend[lt]{\red \rule[1ex]{2em} {1pt} & courbe 1 \\ \blue \rule[1ex]{2em}{1pt} & courbe 2 \\ \green \rule[1ex]{2em}{1pt} & courbe 3 }

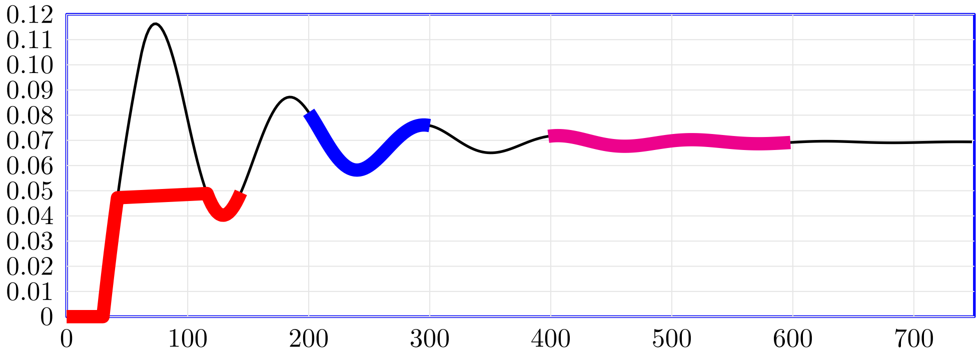
26.8 Points particuliers sur les axes

syntaxe :
\psxTick [Options]{rotation}(x position){label}
\psyTick [Options]{rotation}(y position){label}



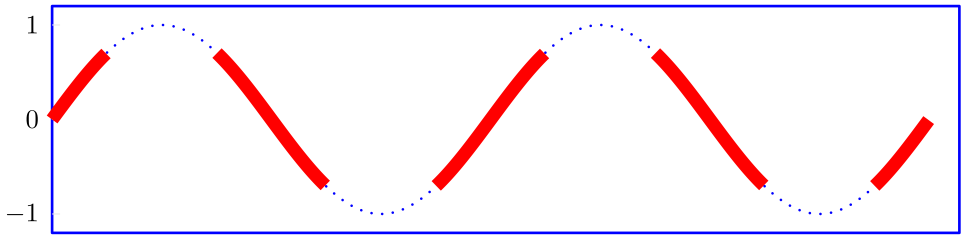
```
\psxTick[linecolor=red,labelsep=-20pt ]{45}(3.25){\red X=3.25}
\psyTick[linecolor=magenta](1.5){\magenta Y=1.5}
```

26.9 Portion de courbe

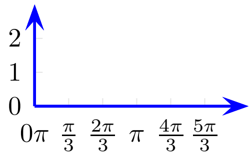
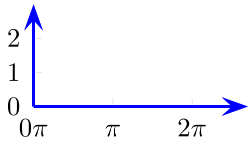
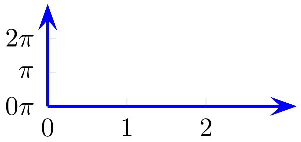


```
\listplot[xStart=200,xEnd=300,linecolor=blue,linewidth=5pt]{\dat}
\listplot[yStart=0,yEnd=.05,linecolor=red,linewidth=5pt]{\dat}
\listplot[nStart=200,nEnd=300,linecolor=magenta,linewidth=5pt]{\dat}
```

26.10 Option yMaxValue et yMinValue


\psplot[yMaxValue=.7,yMinValue=-.7,plotpoints=2000,linecolor=red,linewidth=5pt]{0}{12.56}{sin(x)}
Par défaut yMaxValue= 1.e30 yMinValue = -1.e30

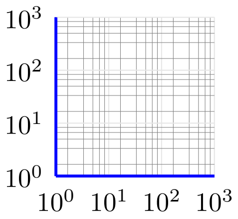
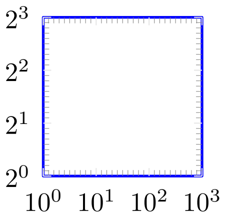
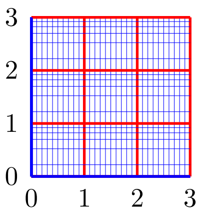
26.11 Échelle trigonométrique

		
trigLabels=true trigLabelBase=3	xtrigLabels=true dx=**\pstRadUnit**	ytrigLabels=true xunit=\pstRadUnit
Par défaut : trigLabelBase = 0 , trigLabels = false , xtrigLabels = false , ytrigLabels = false		

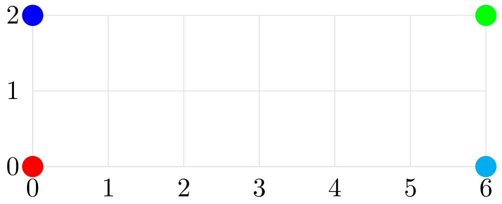
Constantes prédéfinies

nom	valeur	math
\psPiFour	12.566371	4π
\psPiTwo	6.283185	2π
\psPi	3.14159265	π
\psPiH	1.570796327	$\pi/2$
\pstRadUnit	1.047198cm	$\pi/3$
\pstRadUnitInv	0.95493cm	$3/\pi$

26.12 Échelle logarithmique

		
xylogBase=10 logLines=all subticks=5	xlogBase=10 ylogBase=2 subticks=10, tickstyle=inner	ylogBase={} logLines=all subticks=5 xsubticks =10

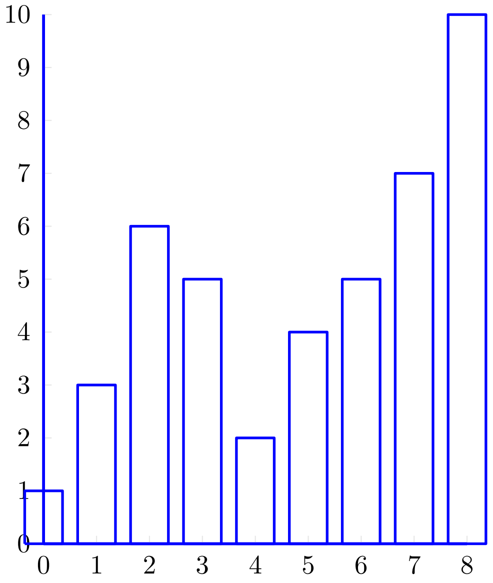
26.13 Coordonnées de l'environnement psgraph



\psdot[linecolor=red](\psgraphLLx,\psgraphLLy) [18] [18]
\psdot[linecolor=blue](\psgraphLLx,\psgraphURy) [18]
\psdot[linecolor=cyan](psgraphURx,\psgraphLLy) [18]
\psdot[linecolor=green](\psgraphURx,\psgraphURy)

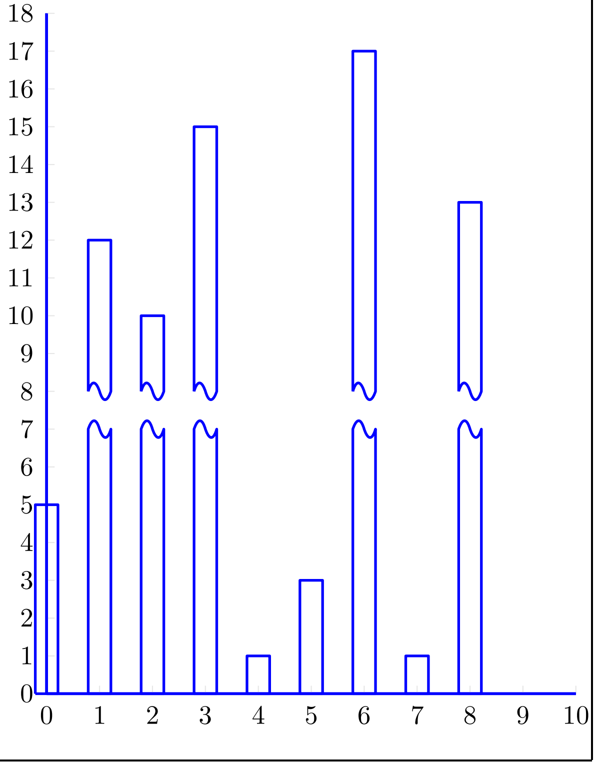
26.14 paramètres d'un graphe en barres

\listplot[plotstyle=bar,barwidth=1]{\dat}



Par défaut : barwidth = 0.25cm

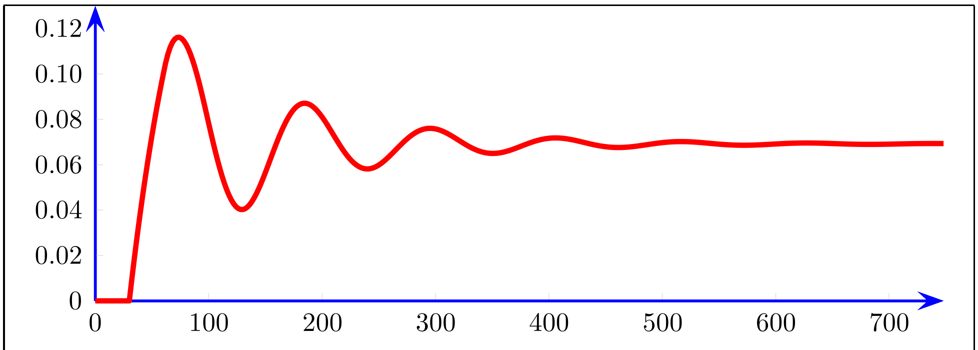
```
\listplot[plotstyle=bar,interrupt={7,1,5}]
{ 0 5 1 17 2 15 3 20 4 1 5 3 6 22 7 1 8 18 }
```



27 Créer un graphe d'après un fichier de données

27.1 Macro fileplot , psfileplot [1] [18]

Syntaxe : **fileplot** [Options] {fichier} ou **psfileplot** [Options] {fichier}

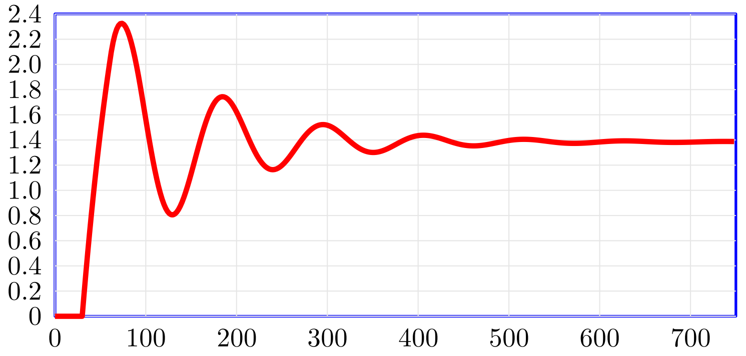


fileplot[linecolor=red,linewidth=2pt]{mesdata.dat}

option plotstyle : seulement	« line »	« polygon »	« dots »	
Séparateurs de données :	« {} »	« () »	« , »	« espace »

27.2 Macro dataplot , psdataplot

Syntaxe : **dataplot** [Options] {\macro} ou **psdataplot** [Options] {\macro}
Elle doit être précédé de : **readdata**{\macro}{nomfichier}



readdata{\dat}{mesdata.dat}
dataplot[linecolor=red,linewidth=2pt]{\dat}

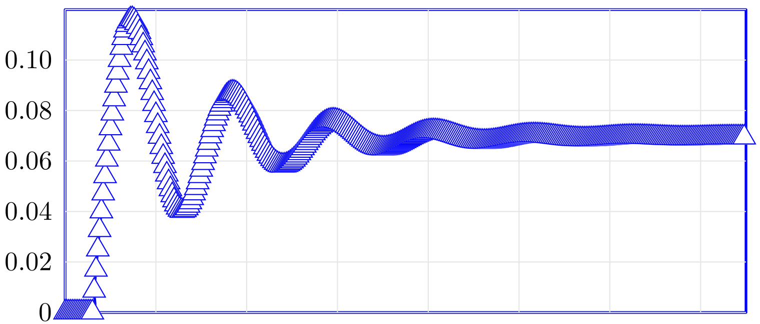
27.3 Macro savedata

Syntaxe : **savedata**{\macro}[données en XY]

savedata{\mydata}[{x0, y0}, {x1., y1}, ... {xn., yn}]

27.4 Macro listplot , pslistplot

Syntaxe : **listplot**{data} **pslistplot**{data}

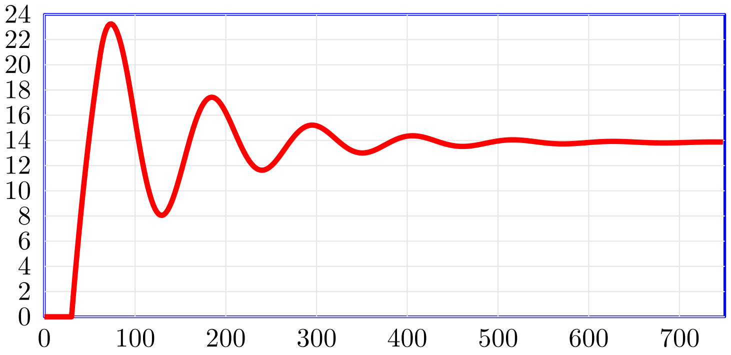


listplot[plotstyle=curve,showpoints=true,dotstyle=triangle]{\dat}

liste des coordonnées séparées que par des espaces blancs !

27.5 Échelle des données

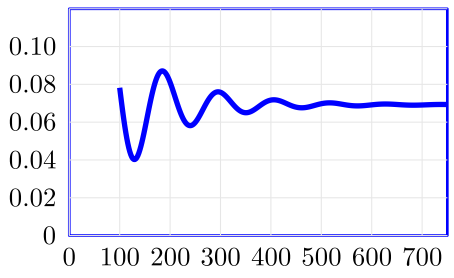
pstScalePoints(facteur échelle X,facteur échelle Y){code calcul postscript sur X}{code calcul postscript sur Y }



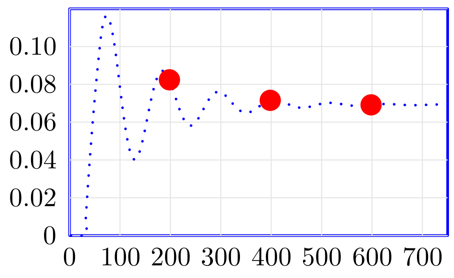
pstScalePoints(1,100){}{}

ne fonctionne qu'avec \listplot et \pslistplotOnly work with \listplot and \pslistplot !

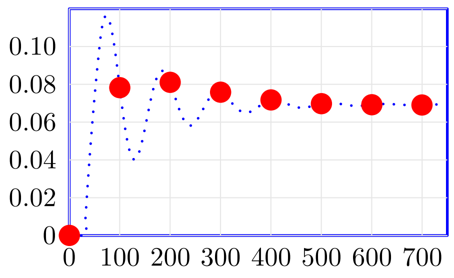
27.6 Options de lecture de fichier



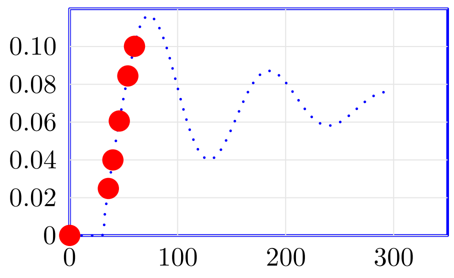
ignoreLines=100



nStep=100



xStep=100



yStep=0.02,xEnd=300

27.7 Table de données multiples

Soit une table de données est organisée ainsi :

A	B	C	B

```
\listplot[plotNoMax=3,plotNoX=2,plotNo=2]{\data}
```

plotNoX=2 :la colonne B correspond à X
plotNoMax=3 :soit 2 colonnes y + 1 colonne x
plotNo=2 :la colonne C correspond à Y

27.8 Macro sur Excel

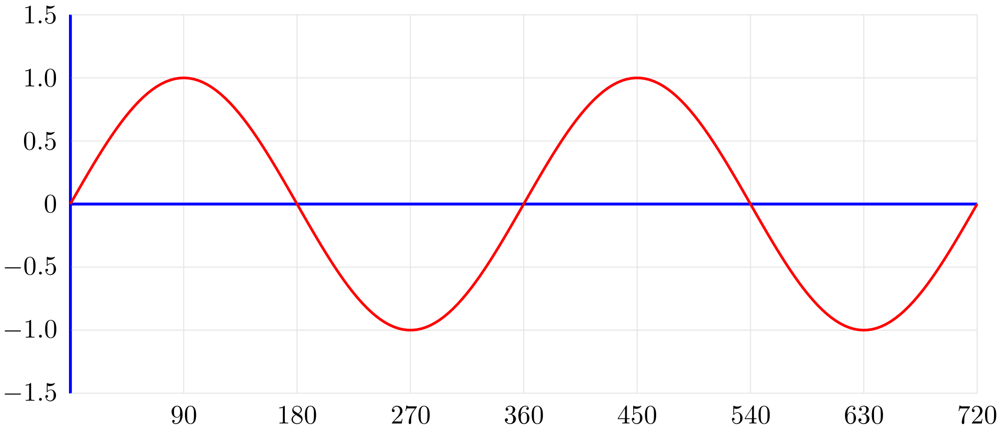
Voici un programme en Visual Basic permettant de créer son fichier de données d’après une feuille Excel

```
Sub mesdata()
deb = 8                    ’ première ligne de données
fin = 382                   ’ dernière ligne de données
colX = 5                    ’ colonne des valeurs de X
colY = 6                    ’ colonne des valeurs de Y
nom = "mesdata.dat"           ’ nom du fichier

Dim valX, valY As Double

’pour effacer le fichier
Open nom For Output Access Write As #1
Close #1

’création du fichier
For i = deb To fin
Open nom For Append As #1
valX = Cells(i, colX)
valY = Cells(i, colY)

Write #1, valX
Write #1, valY
Close #1
Next

End Sub
```

A copier dans un module Excel et modifier les paramètres deb, fin , colX, colY et nom

28 Créer un graphe d'après une équation

28.1 Macro psplot

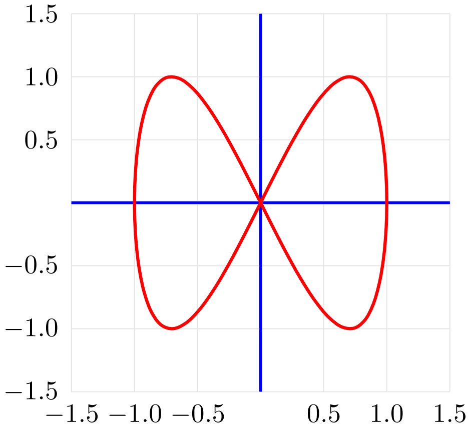


```
\psplot[plotpoints=200,linecolor=red]{0}{720}{x sin}
```

nombre de points utilisés — unité de x en degré — fonction en langage PostScript [1]

Par défaut : plotpoints = 50

28.2 Macro parametricplot



```
\parametricplot[linewidth=1.2pt,plotstyle=ccurve,linecolor=red]
{0}{360}{t sin t 2 mul sin}
```

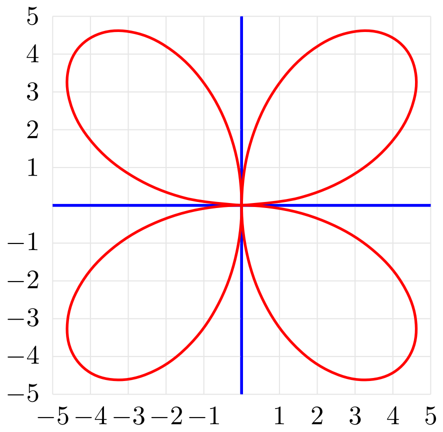
(functions : $sin(t)$ et $sin(2t)$)

L'unité de t est le degré — Les deux fonctions doivent être écrites en langage PostScript !

---

[1] formule de calcul en langage PostScript (voir 240)

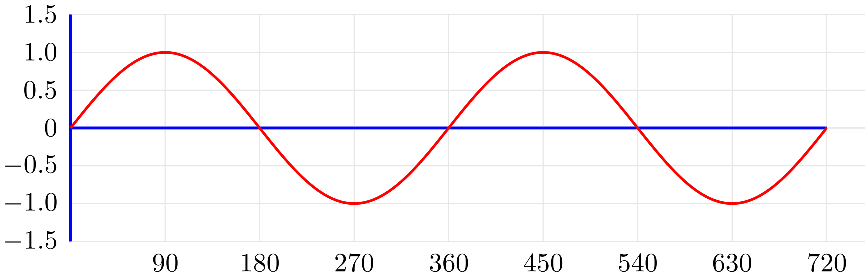
28.3 Graphe polaire



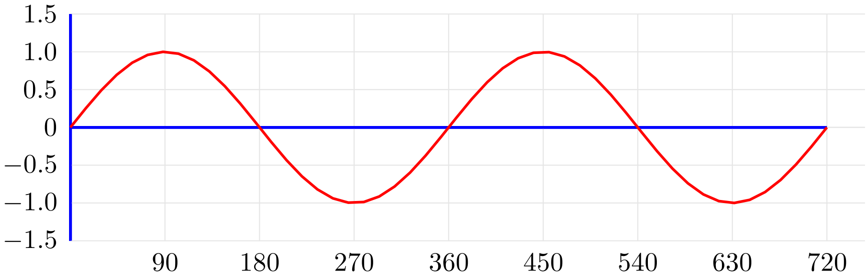
```
\psplot[plotstyle=curve,polarplot=true,linecolor=red]
{0}{360} { x 2 mul sin 6 mul }
```

$(6 * sin(2 * x))$

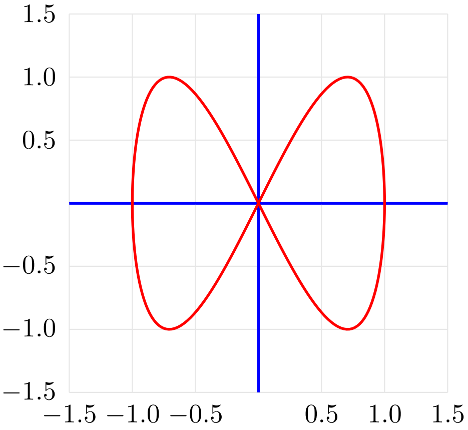
28.4 Modules infix-RPN et pst-infixplot [12]



```
\infixtoRPN{sin(x)}
\psplot[plotpoints=200]{0}{720}{\RPN}
```

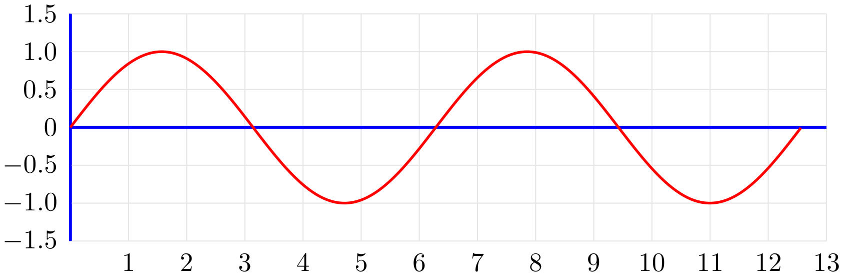


```
\psPlot{0}{720}{sin(x)}
```



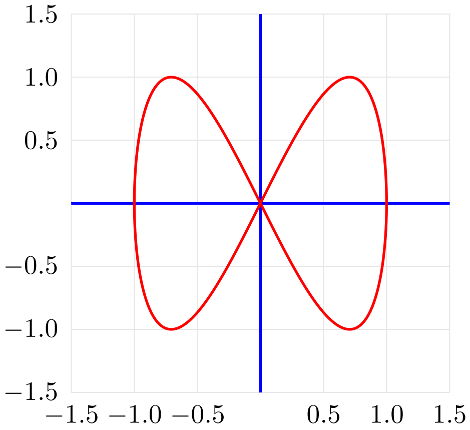
```
\parametricPlot[linecolor=red,plotpoints=200]{0}{360}{sin(t)}{sin(2*t)}
```

28.5 Option algebraic



```
\psplot[algebraic,plotpoints=200]{0}{12.56}{sin(x)}
```

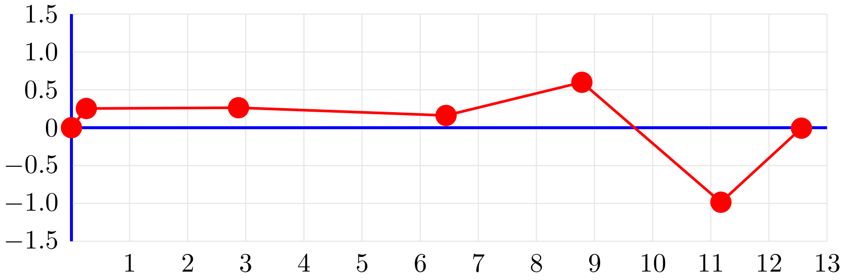
L'unité de x est le *radian*



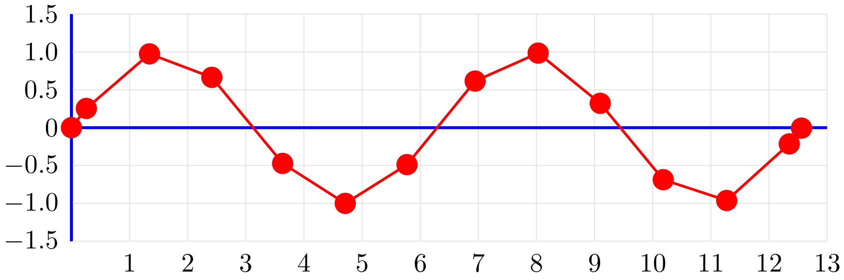
\parametricplot[algebraic,plotpoints=200]{0}{6.28}{sin(t)|sin(2*t)}

L'unité de t est le *radian*

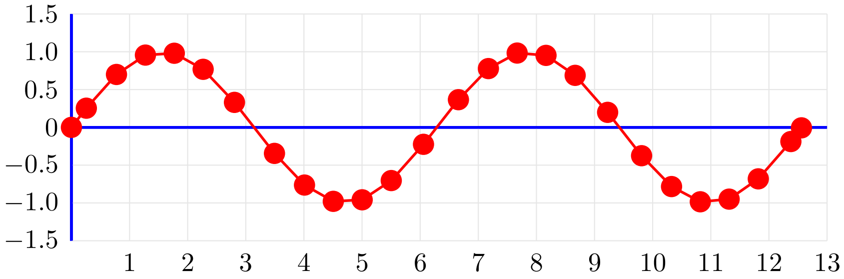
28.6 Options VarStep et VarStepEpsilon



```
\psplot[algebraic,VarStep=true,showpoints=true,VarStepEpsilon=1]0{12.56}{ sin(x)}
```



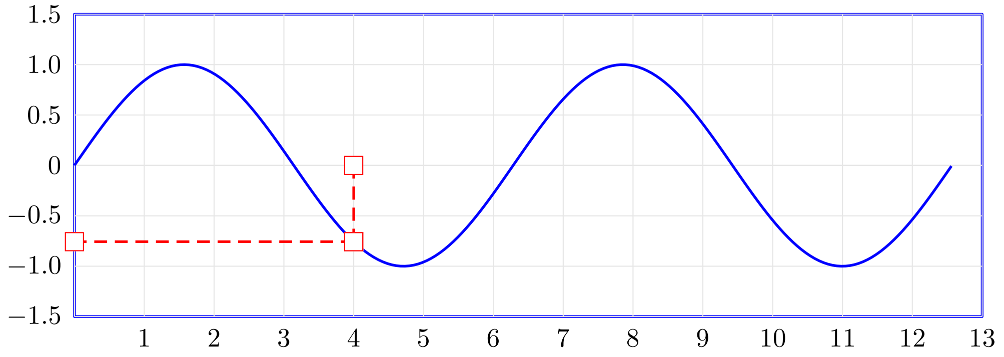
```
\psplot[algebraic,VarStep=true,showpoints=true,VarStepEpsilon=0.1]0{12.56}{ sin(x)}
```



```
\psplot[algebraic,VarStep=true,showpoints=true,VarStepEpsilon=.001]0{12.56}{ sin(x)}
```

29 Des outils pour les graphes

29.1 Coordonnées d'un point



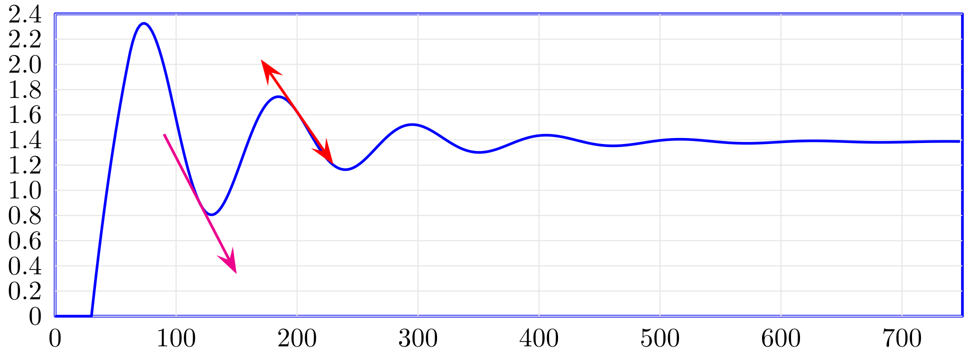
\psCoordinates[linecolor=red,linestyle=dashed,dotstyle=square,dotscale=2](*4 {sin(x)})

29.2 Tangente [2]

29.3 Tangente

29.3.1 Tangente à une courbe d'après un fichier de données

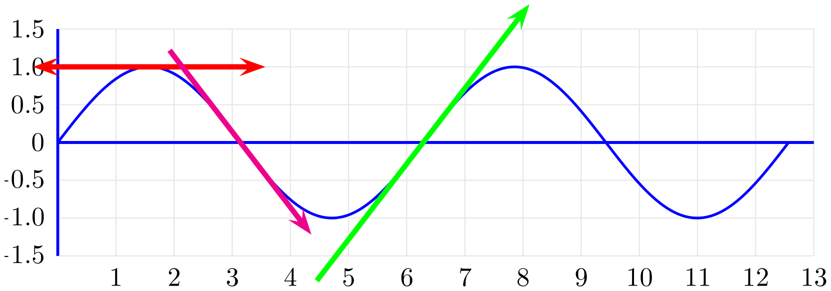
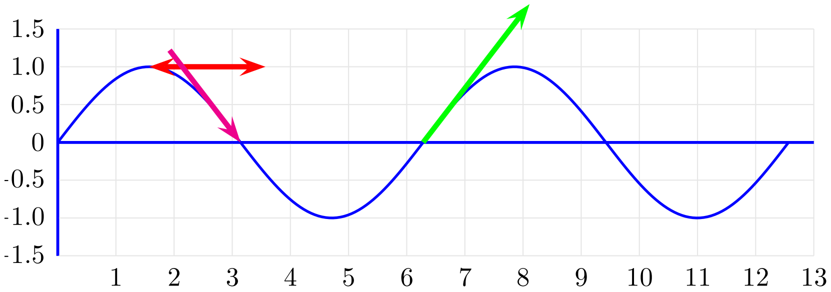
\psTangentLine[Options] (x1,y1)(x2,y2)(x3,y3){x}{dx}



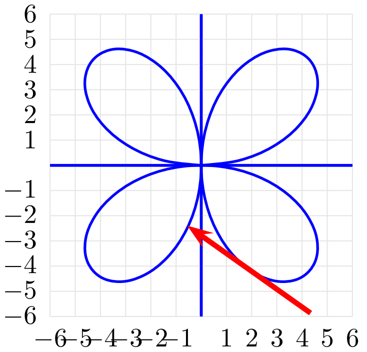
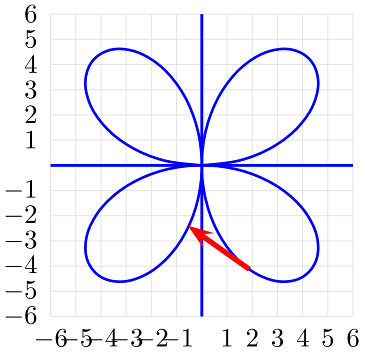
\psTangentLine[linecolor=magenta,arrows=->](118,0.0465)(120,0.0445)(122,0.0428){120}{30}
\psTangentLine[linecolor=red,arrows=<->] (198,0.0824)(200,0.0811)(202,0.07962){200}{30}

29.3.2 Tangente à une fonction [2]

syntaxe : **\psplotTangent** * [Options] {x}{dx}{function}

Commande sans astérisque

\psplotTangent[linecolor=red,arrows=<->]{\psPiH}{2}{sin(x)} [1] \psplotTangent[linecolor=magenta,arrows=<-]{\psPi}{2}{sin(x)} \psplotTangent[linecolor=green,arrows=->]{\psPiTwo}{3}{sin(x)}
Commande avec astérisque

\psplotTangent*[linecolor=red,arrows=<->]{\psPiH}{2}{sin(x)} \psplotTangent*[linecolor=magenta,arrows=<-]{\psPi}{2}{sin(x)} \psplotTangent*[linecolor=green,arrows=->]{\psPiTwo}{3}{sin(x)}

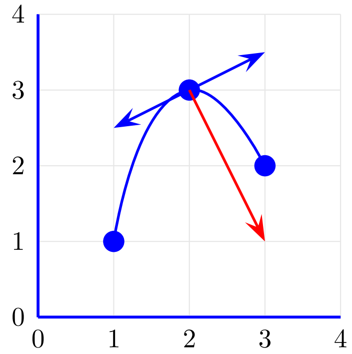
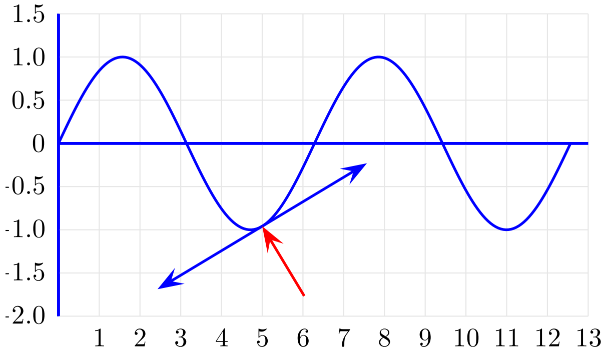
29.3.3 Tangente à une courbe polaire [2]

Commande sans astérisque	Commande avec astérisque
	
\psplotTangent[polarplot,linecolor=red,arrows=->]{2}{3}{6*sin(2*x)} [1]	

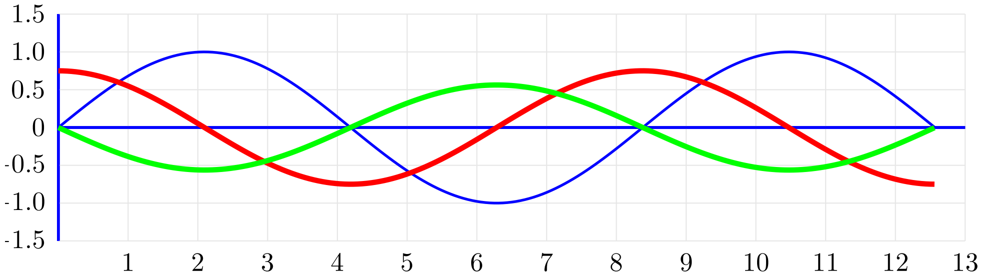
---

[1] arrowscale=2,algebraic=true,linewidth=2pt

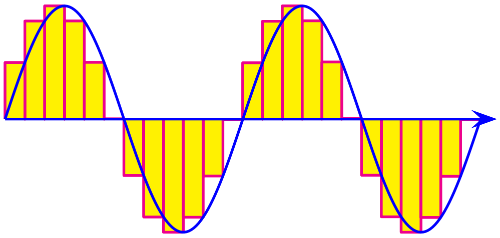
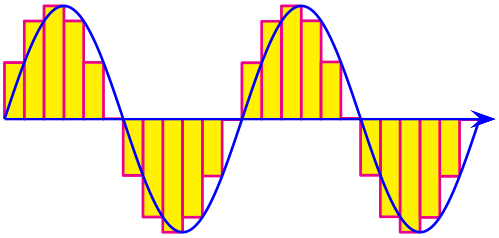
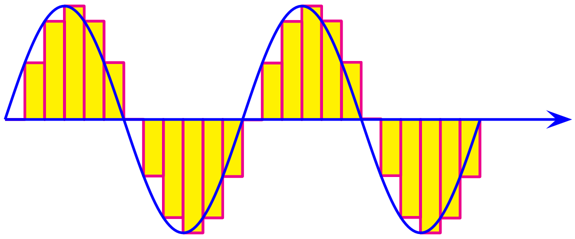
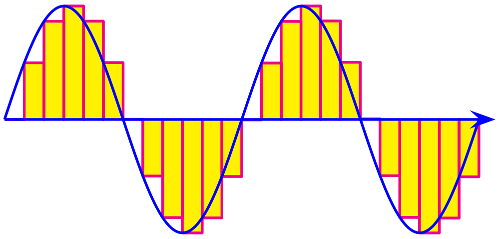
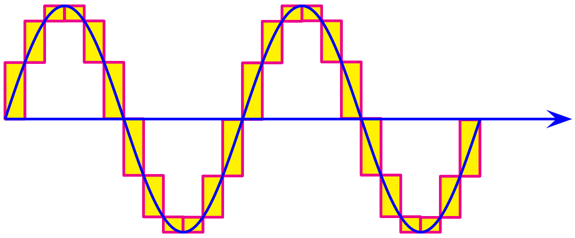
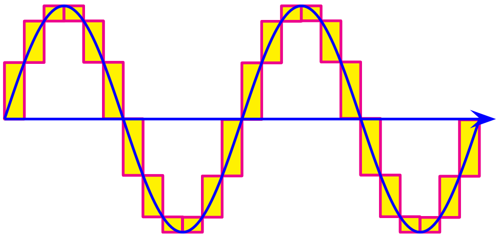
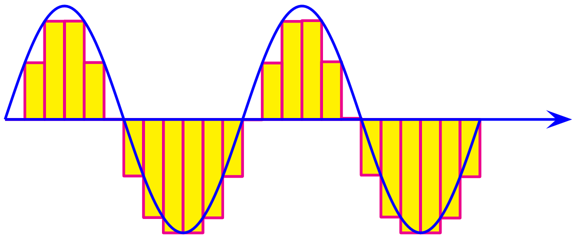
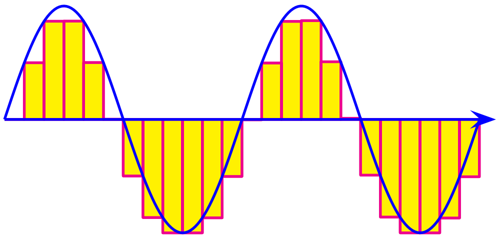
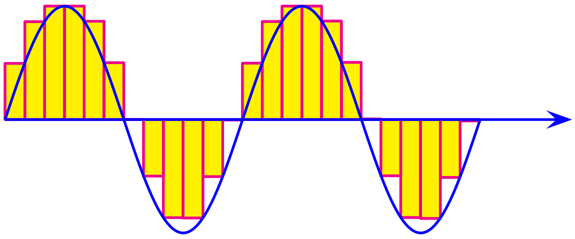
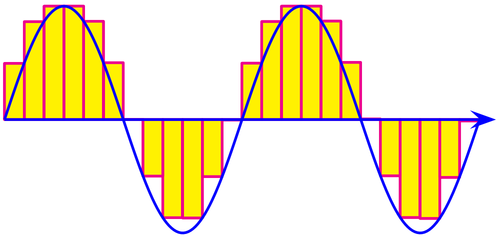
29.3.4 Normale à une courbe [2]

	
\psTangentLine[Tnormal](1,1)(2,3)(3,2){2}{1}	\psplotTangent[Tnormal]5{2}{sin(x)}

29.3.5 Dérivée [2]


\psplot[algebraic,plotpoints=200,linecolor=red]{0}{12.56}{Derive(**1**,sin(.75*x))} \psplot[algebraic,plotpoints=200,linecolor=green]{0}{12.56}{Derive(**2**,sin(.75*x))}

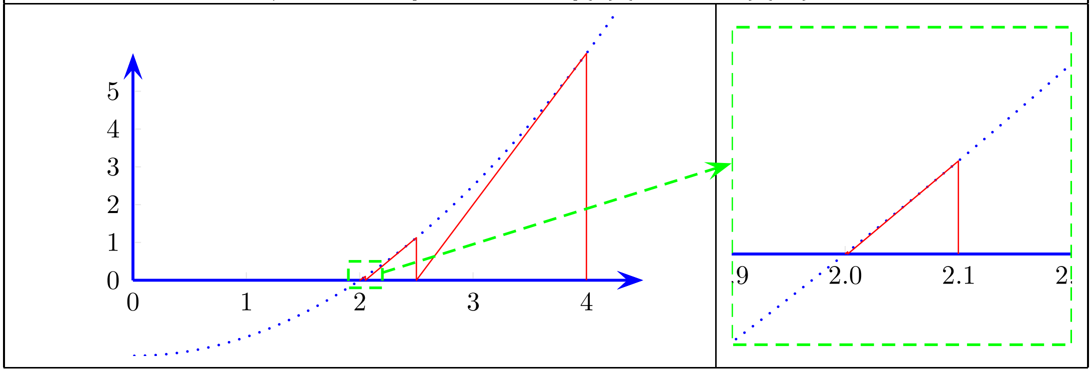
29.3.6 Intégrale de Riemann [2]

	
\psStep[StepType=upper](0,12.56){24}{sin(x)}	**\psStep**[StepType=u](0,12.56){24}{sin(x)}
	
\psStep[StepType=lower](0,12.56){24}{sin(x)}	\psStep[StepType=l](0,12.56){24}{sin(x)}
	
\psStep[StepType=Riemann](0,12.56){24}{sin(x)}	\psStep[StepType=R](0,12.56){24}{sin(x)}
	
\psStep[StepType=infimum](0,12.56){24}{sin(x)}	\psStep[StepType=i](0,12.56){24}{sin(x)}
	
\psStep[StepType=supremum](0,12.56){24}{sin(x)}	\psStep[StepType=s](0,12.56){24}{sin(x)}

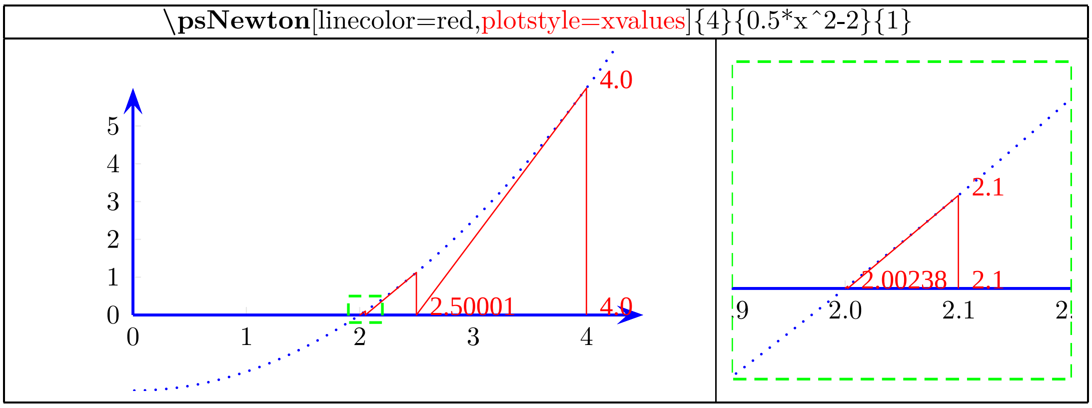
29.3.7 Méthode de Newton [18]

syntaxe : \psNewton [Options] {x0} {f(x)} {nombre d'itération}

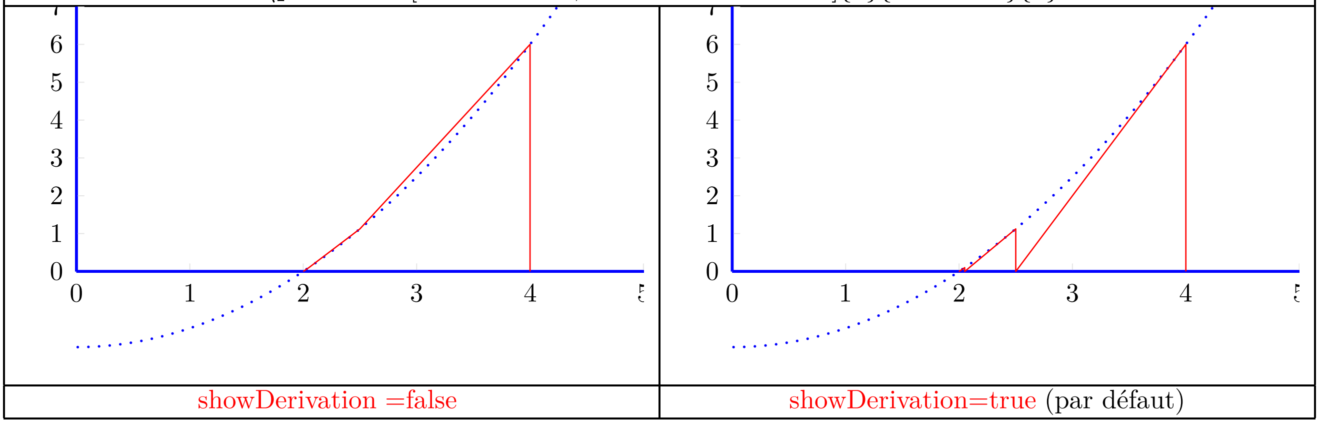
\psplot[algebraic,linestyle=dotted]{0}{12.56}{0.5*x^2-2}
\psNewton[linecolor=red]{4}{0.5*x^2-2}{20}



\psNewton[linecolor=red,plotstyle=xvalues]{4}{0.5*x^2-2}{1}



\psNewton[linecolor=red,showDerivation=false]{4}{0.5*x^2-2}{1}

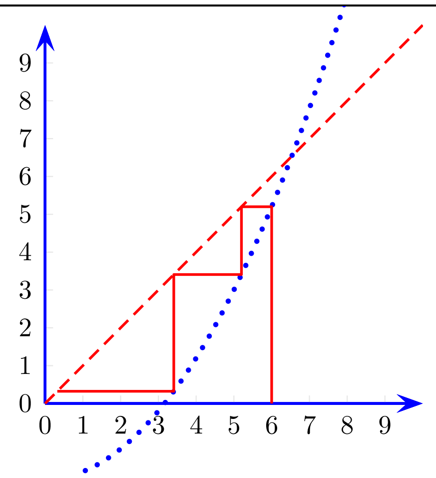


showDerivation =false

showDerivation=true (par défaut)

29.4 Macro psFixpoint [18]

syntaxe : \psFixpoint [Options] {x_0}{f(x)}{nombre d'itération}

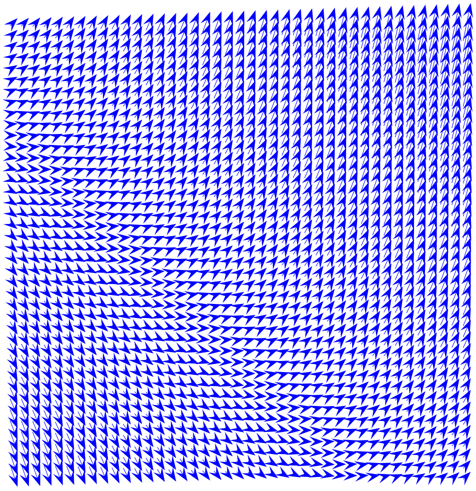


```
\psplot[algebraic,linestyle=dotted]{1}{10}{0.5*x^2-2}
\psline[linecolor=red,linestyle=dashed](10,10)
\psFixpoint[linecolor=red]{6}{0.5*x^2-2}{3}
```

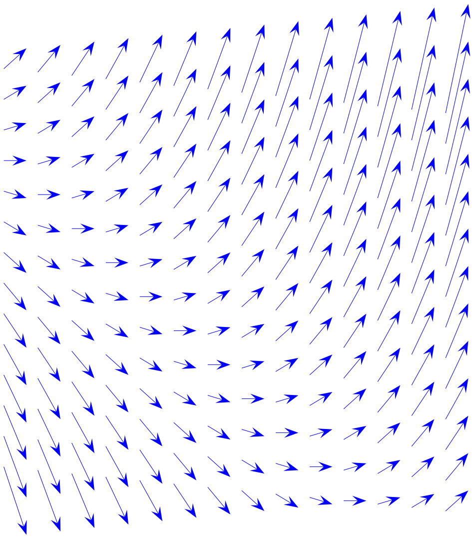
29.5 Macro psVectorfield [18]

Solutions de $\frac{dy}{dx} = x + y + 1$

\psVectorfield[algebraic](-2,-2)(2,2){ x+y+1}



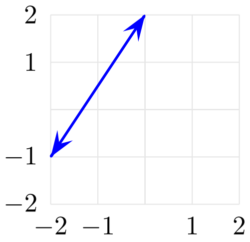
\psVectorfield[algebraic,Dx=0.3,Dy=0.3](-2,-2)(2,2){ x+y+1}



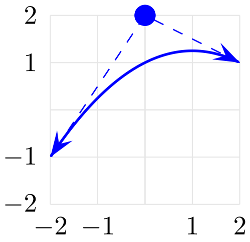
Par défaut : Dx= 0.1 , Dy= 0.1

30 Tracé de fonctions mathématiques

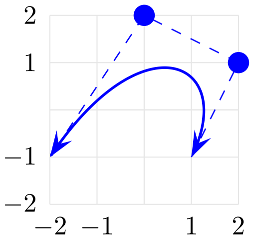
30.1 Courbe de Bezier



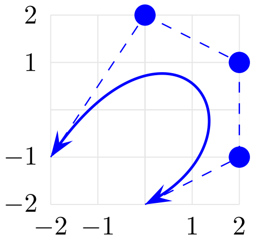
\psBezier1



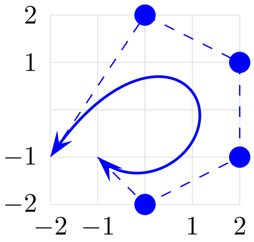
\psBezier2



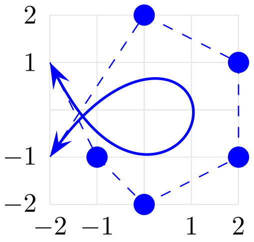
\psBezier3



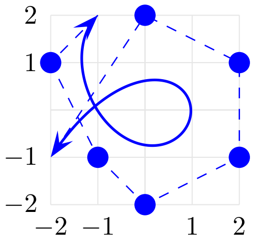
\psBezier4



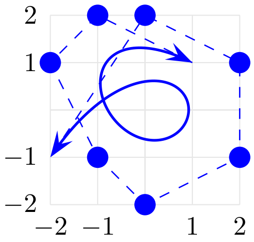
\psBezier5



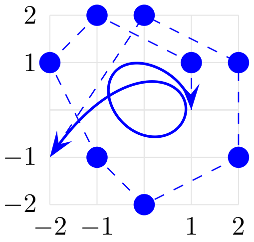
\psBezier6



\psBezier7



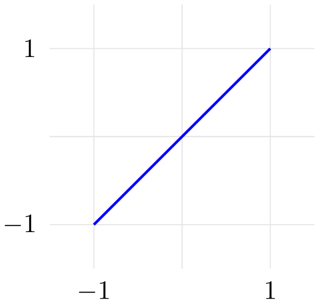
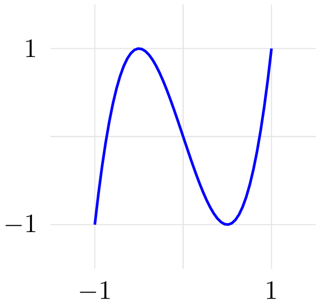
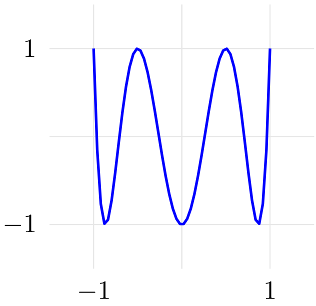
\psBezier8



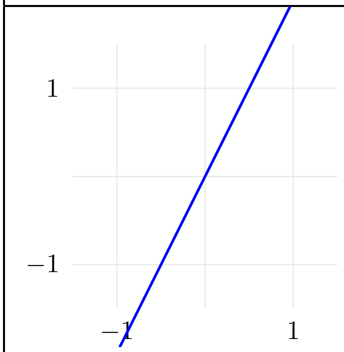
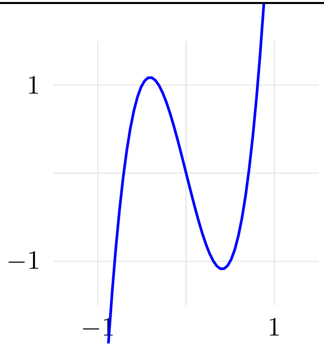
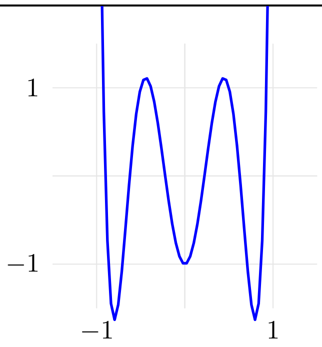
\psBezier9

30.2 Polynôme de Chebyshev

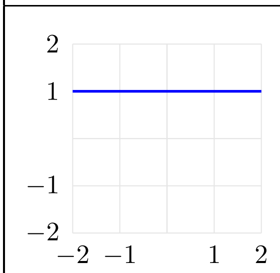
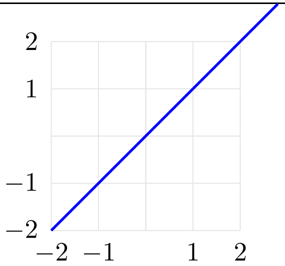
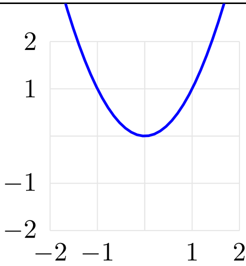
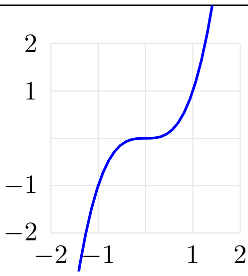
30.2.1 Polynôme de première espèce

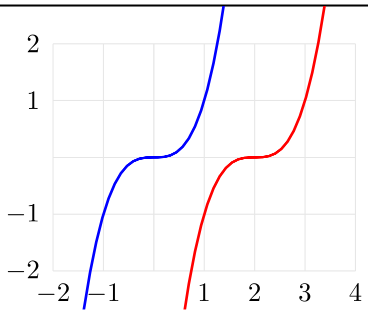
\psplot{-1}{1}{1 x **\ChebyshevT** }		
		
1 x **\ChebyshevT**	3 x **\ChebyshevT**	6 x **\ChebyshevT**

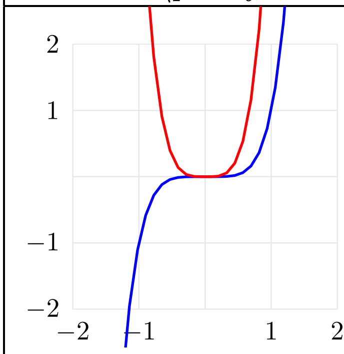
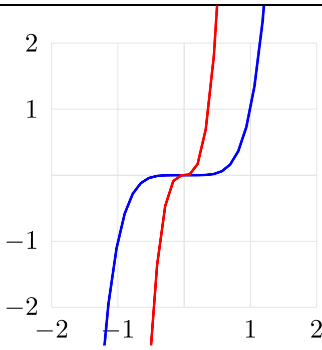
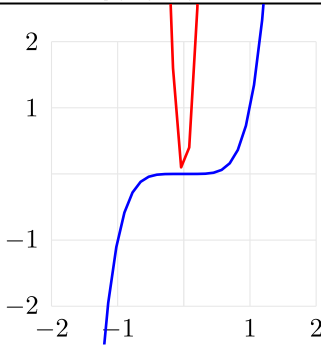
30.2.2 Polynôme de deuxième espèce

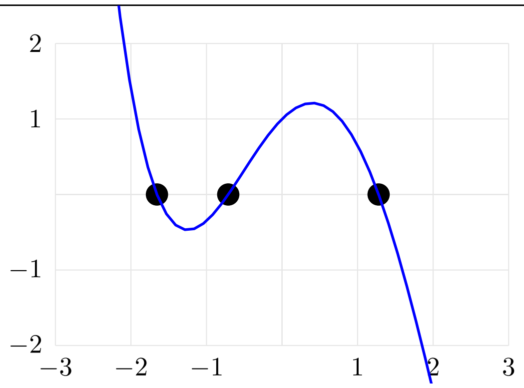
\psplot{-1}{1}{1 x **\ChebyshevU** }		
		
1 x **\ChebyshevU**	3 x **\ChebyshevU**	6 x **\ChebyshevU**

30.3 Fonction polynomiale

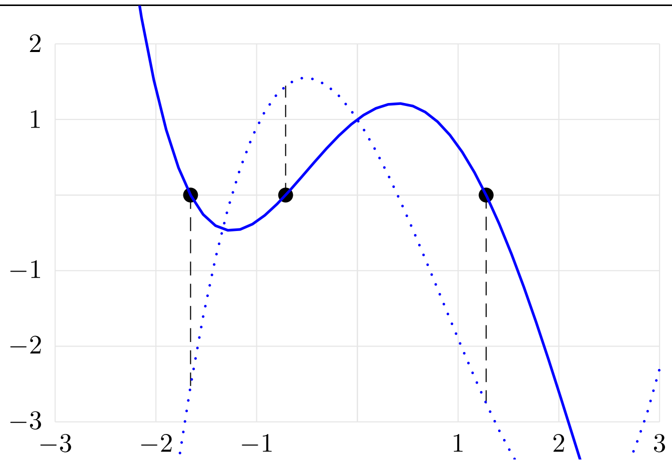
\psPolynomial[coeff= 1]{-2}{2}			
			
coeff= 1 $f(x) = 1$	coeff=0 1 $f(x) = x$	coeff=0 1 $f(x) = x^2$	coeff=0 0 01 $f(x) = x^3$


\psPolynomial[coeff=0 0 0 1 ,linecolor=red,xShift=2]{-2}{4}

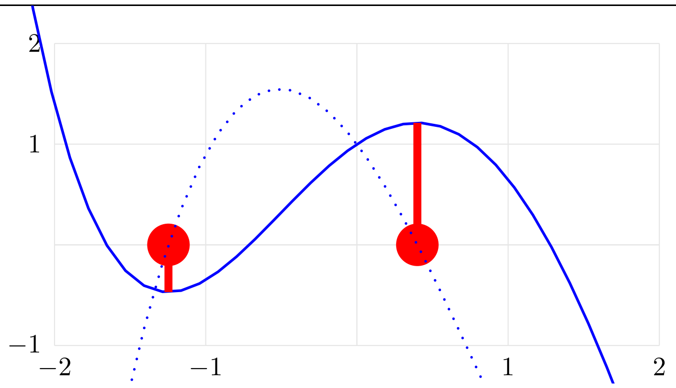
\psPolynomial[coeff=0 0 0 0 0 1 ,linecolor=red,Derivation=1]{-2}{2}		
		
Derivation= 1	Derivation= 2	Derivation= 3



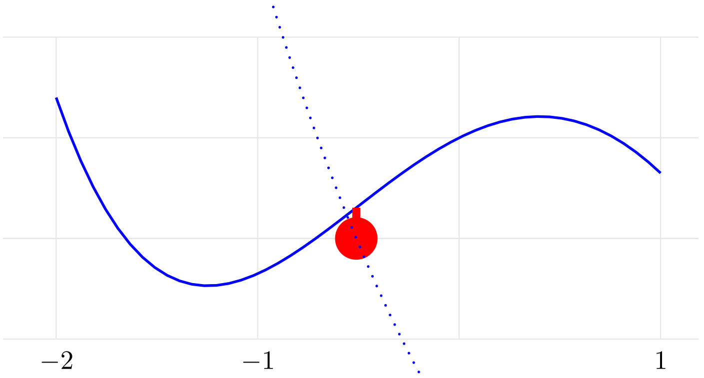
```
\psPolynomial[markZeros,dotscale=3,coeff=1 1 -1 -.5 0.15]{-3}{3}
```



```
\psPolynomial[markZeros,zeroLineTo=1,coeff=1 1 -1 -.5 0.15]{-3}{3}
\psPolynomial[linestyle=dotted,Derivation=1,coeff=1 1 -1 -.5 0.15]{-3}{3}
```

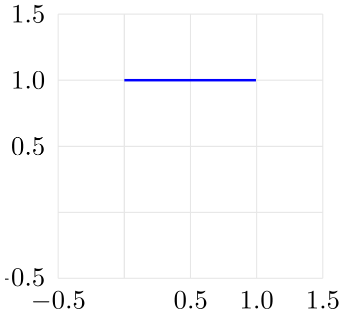


```
\psPolynomial[coeff=1 1 -1 -.5 0.15]{-3}{3}
\psPolynomial[markZeros,linestyle=dotted,Derivation=1,zeroLineTo=0,
zeroLineStyle=solid,zeroLineColor=red,zeroLineWidth=3pt,
coeff=1 1 -1 -.5 0.15]{-3}{3}
```

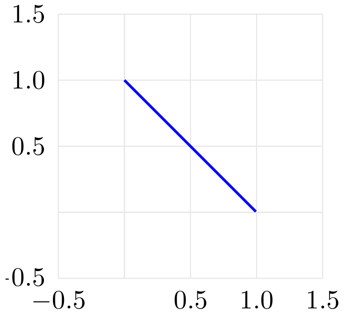


```
\psPolynomial[coeff=1 1 -1 -.5 0.15]{-3}{3}
\psPolynomial[markZeros,linestyle=dotted,Derivation=2,zeroLineTo=0,
        zeroLineStyle=solid,zeroLineColor=red,zeroLineWidth=3pt,
                coeff=1 1 -1 -.5 0.15]{-3}{3}
```

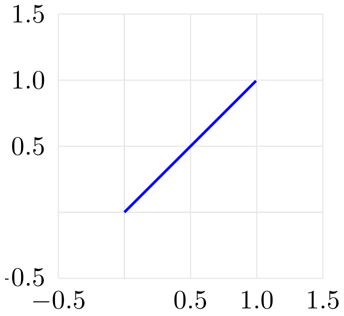
30.4 Polynôme de Bernstein



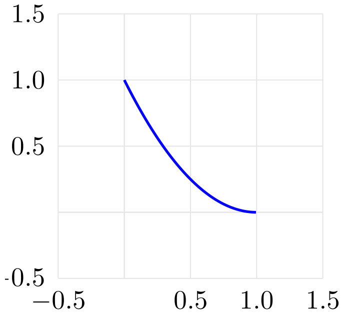
\psBernstein(0,0)



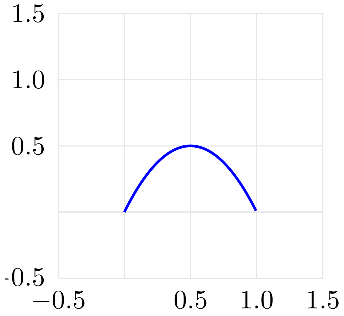
\psBernstein(0,1)



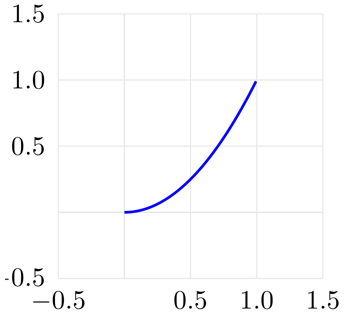
\psBernstein(1,1)



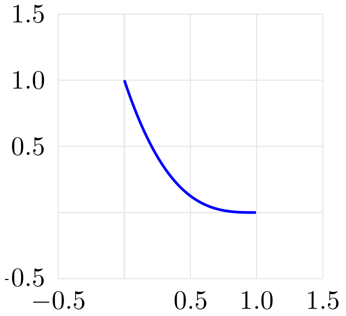
\psBernstein(0,2)



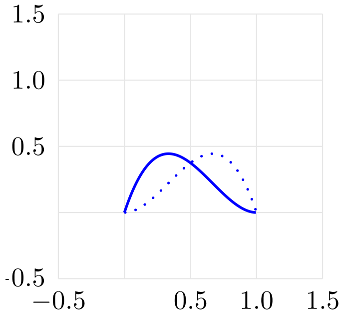
\psBernstein(1,2)



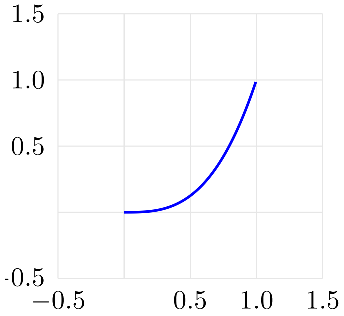
\psBernstein(2,2)



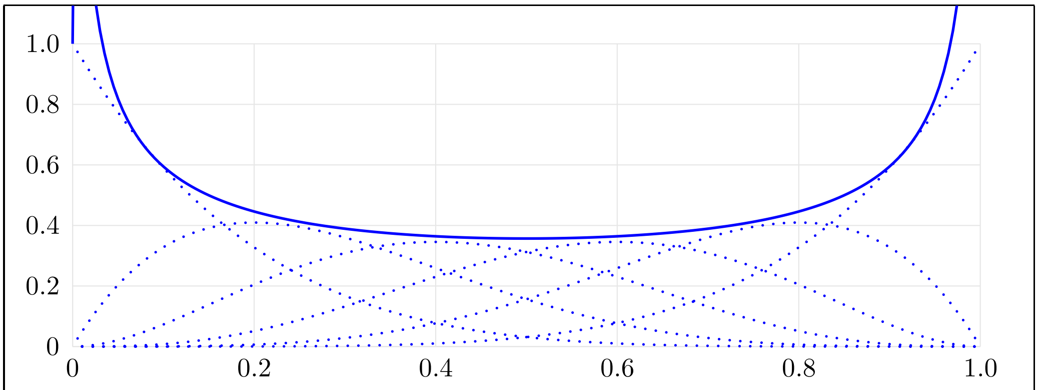
\psBernstein(0,3)



\psBernstein(1,3)
\psBernstein(2,3)



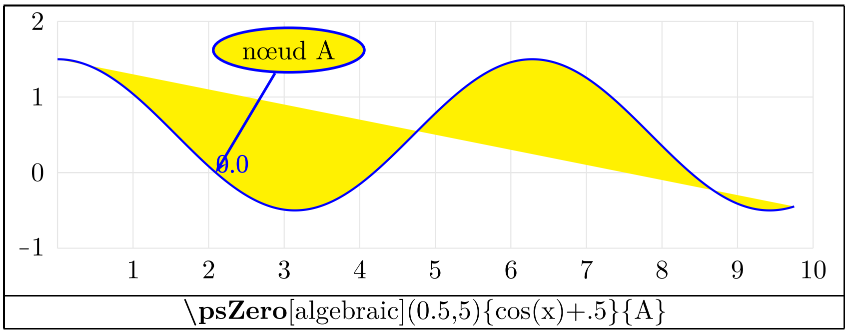
\psBernstein(3,3)



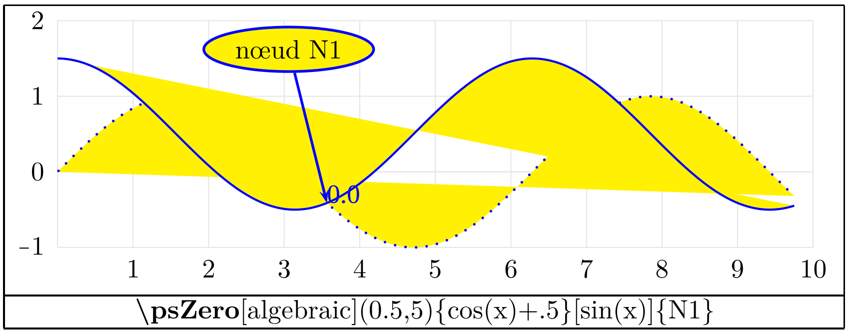
```
\psBernstein[envelope](0,5)
```

fonction

30.5 Zéros d’une fonction ou point d’intersection de deux fonction

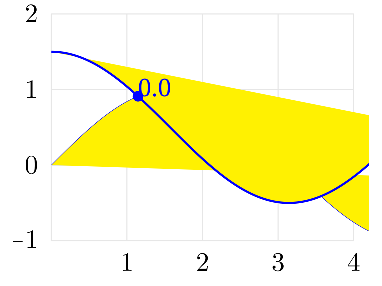


psZero[algebraic](0.5,5){cos(x)+.5}{A}

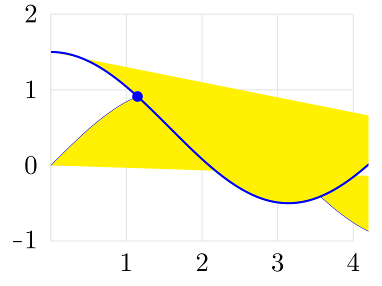


psZero[algebraic](0.5,5){cos(x)+.5}[sin(x)]{N1}

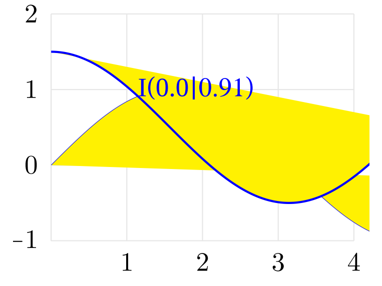
psZero[algebraic,markZeros](0.5,5){cos(x)+.5[sin(x)]}{A}



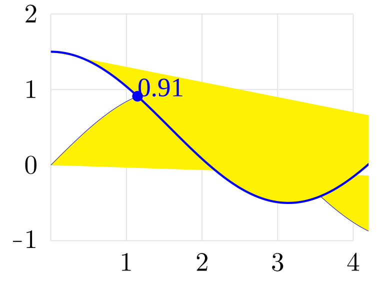
markZeros



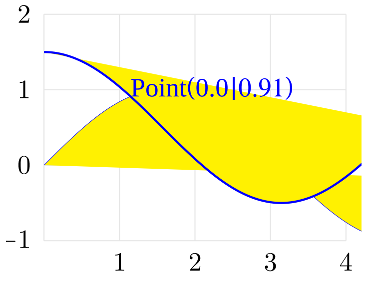
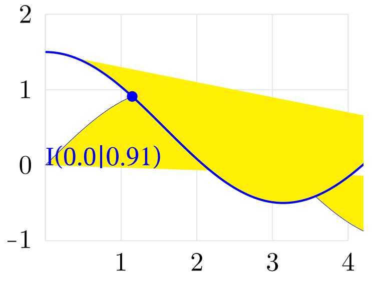
onlyNode

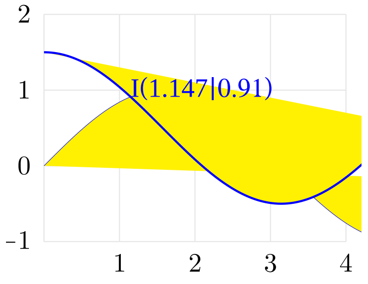
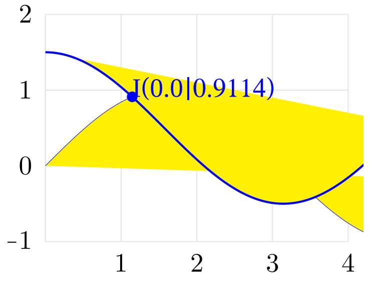


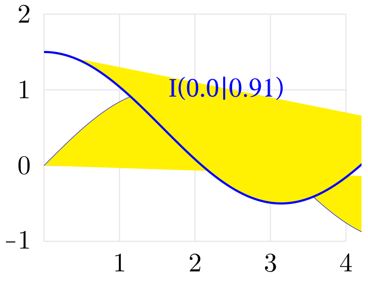
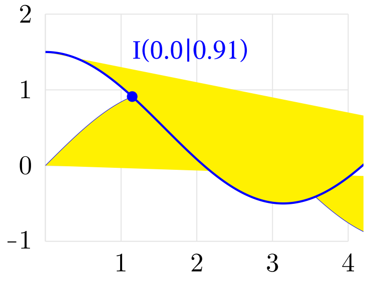
PrintCoord

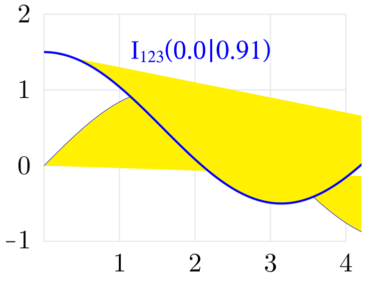


onlyYVal

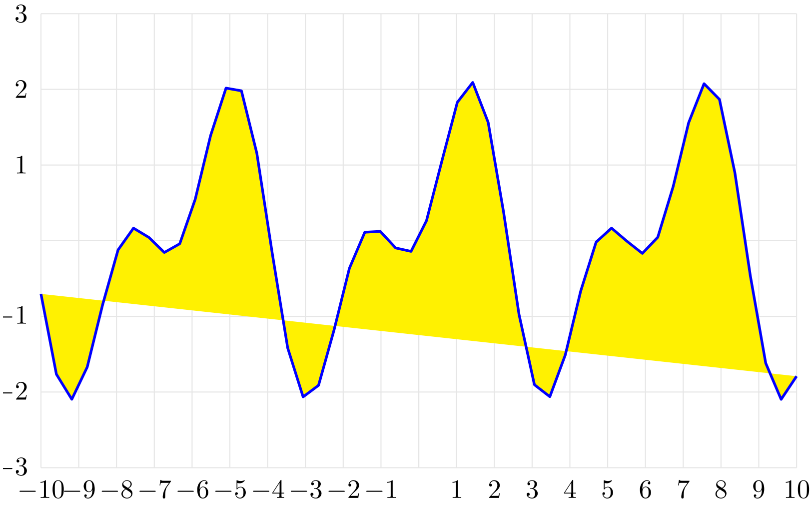
	
PointName,PrintCoord	originV,PrintCoord
Par défaut : PointName= I	

	
decimals=3,PrintCoord	ydecimals=4,PrintCoord

	
xShift=.5,PrintCoord	yShift=.5,PrintCoord

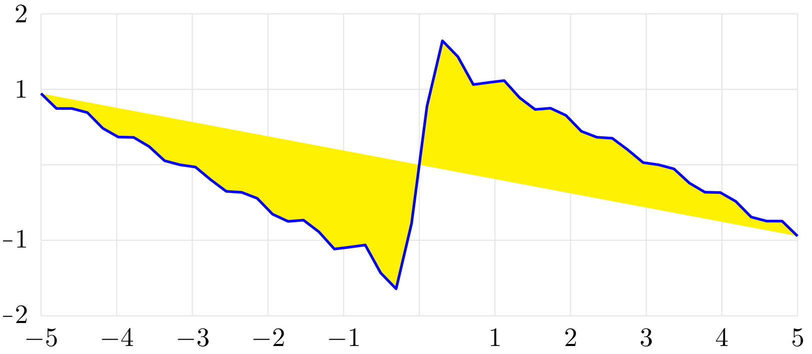
	
postString=123,PrintCoord	

30.6 Fonction de Fourier



psFourier[cosCoeff=0 1 -1]{-10}{10}

Par défaut : cosCoeff =0

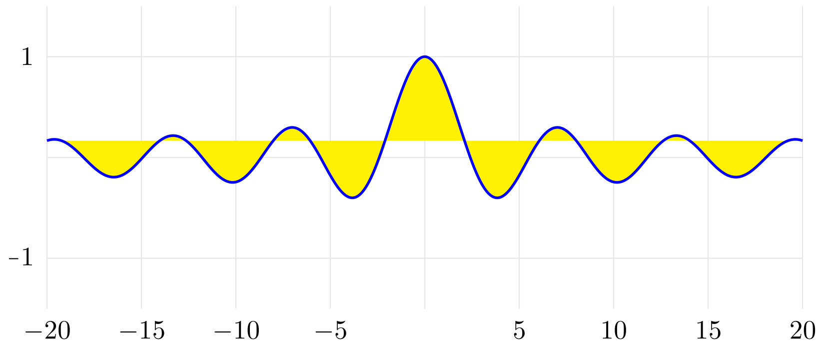


psFourier[sinCoeff=1 .5 .33 .25 .2 .165 .14 .125]{-5}{5}

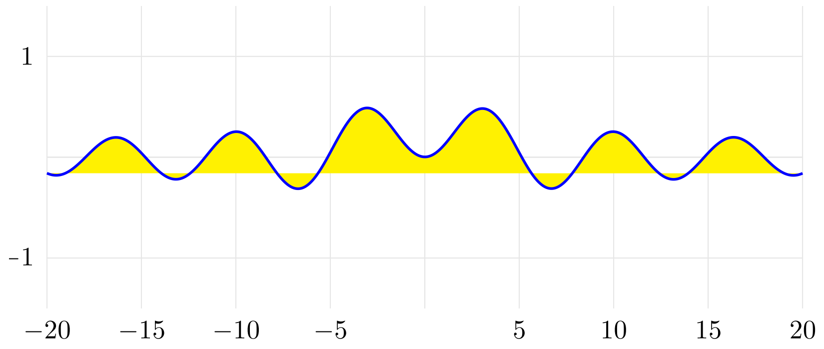
Par défaut : sinCoeff =1

30.7 Fonction de Bessel

$$J_n(x) = \frac{1}{\pi}\int_0^{\pi} \cos(x\sin t - nt)dt$$

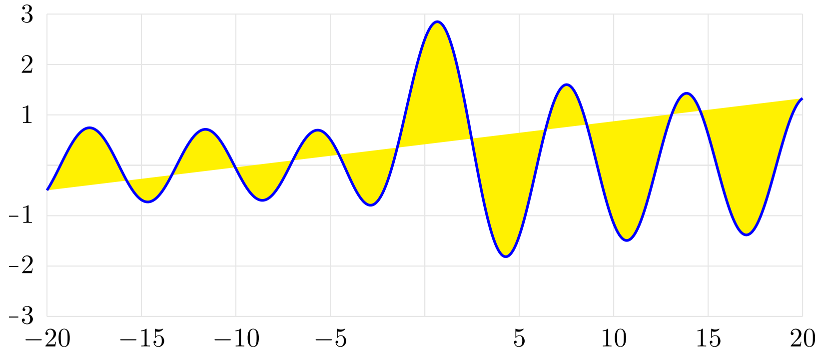


n= 0 **\psBessel**{0}{-20}{20}



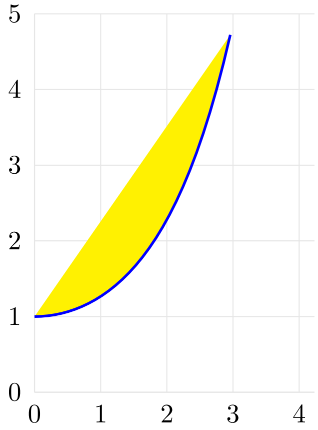
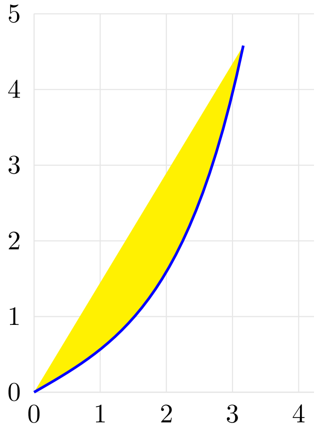
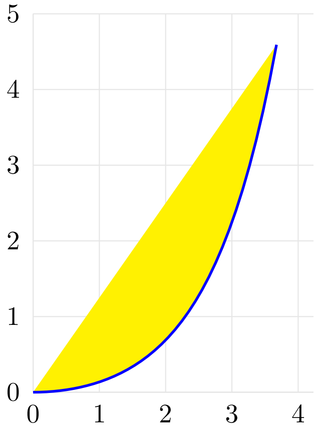
n= 2 **\psBessel**{2}{-20}{20}

$$f(x) = 2.5J_0(x) + sin(t)$$

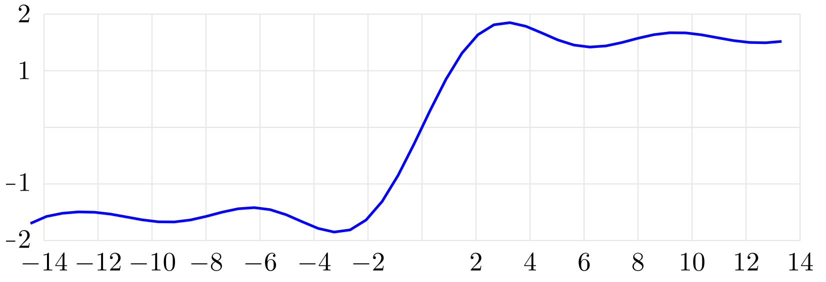


\psBessel[constI=2.5,constII={ t k sin }]{0}{-20}{20}

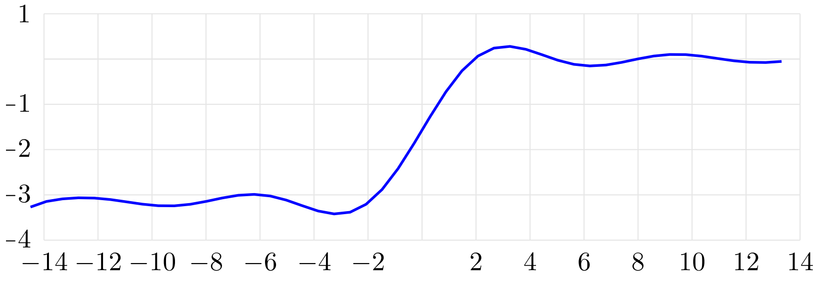
30.8 Fonction de Bessel modifiée

psModBessel[yMaxValue=5,nue=0]{0}{5}		
		
nue=0	nue=1	nue= 2
Par défaut : nue=0		

30.9 Sinus intégral

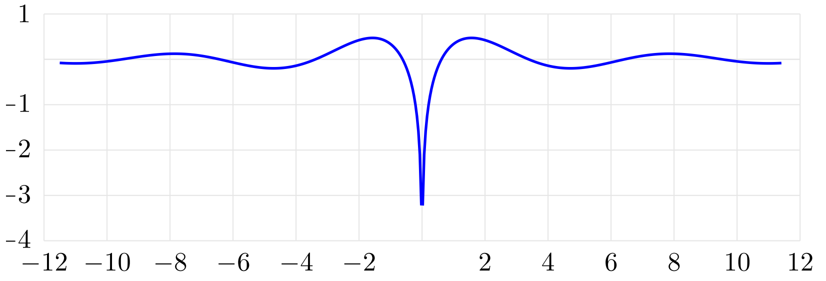


psSi{-14.5}{14.5}

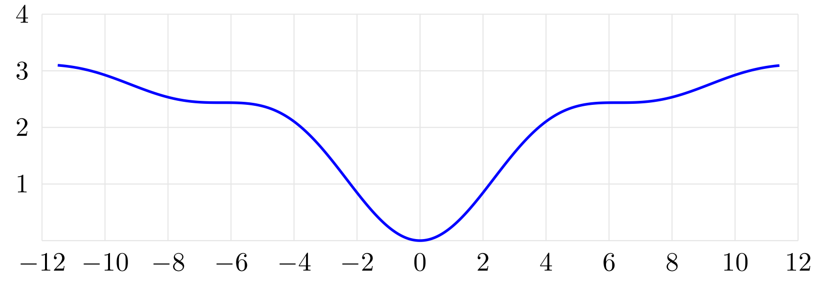


pssi{-14.5}{14.5}

30.10 Cosinus intégral

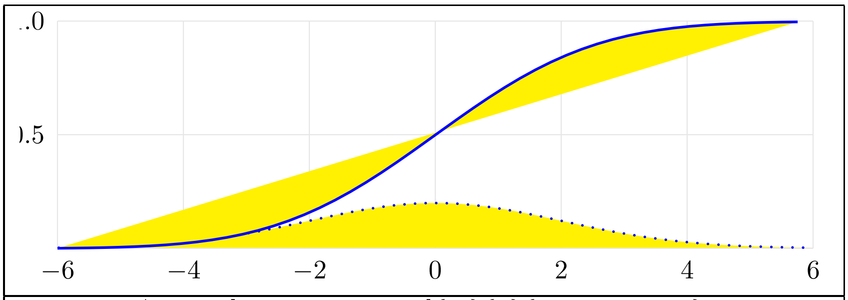


psCi{-11.5}{11.5}

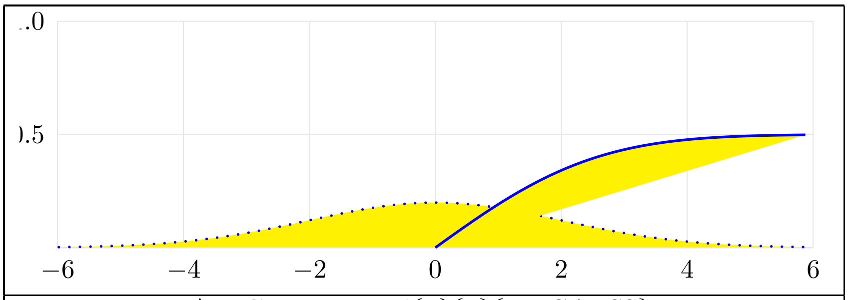


psci{-11.5}{11.5}

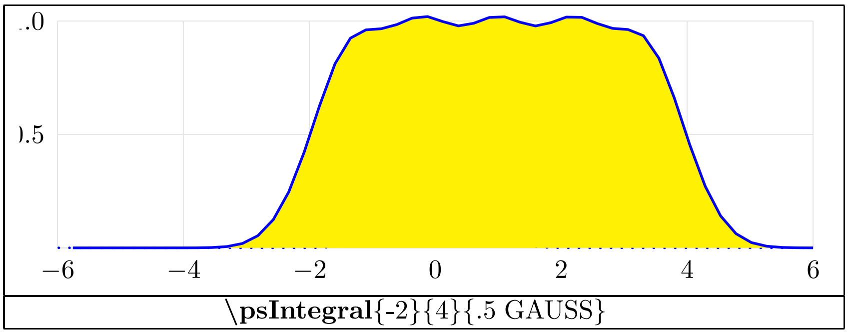
30.11 Intégration et Convolution



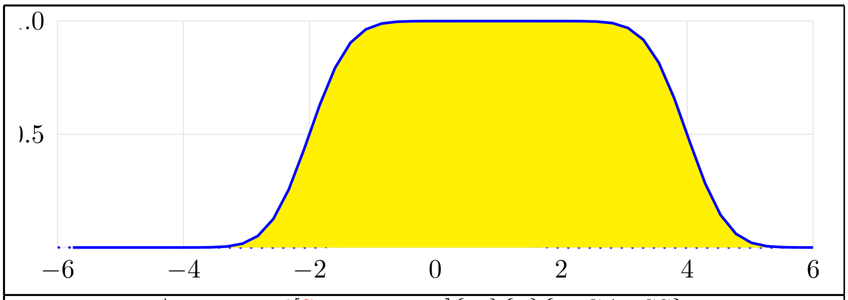
\psplot[linestyle=dotted]{-6}{6}{x 0 2 GAUSS}
\psCumIntegral{-10}{10}{0 2 GAUSS}



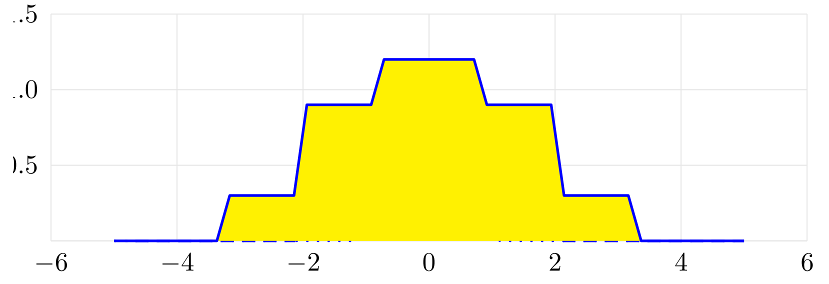
\psCumIntegral{0}{6}{0 2 GAUSS}



\psIntegral{-2}{4}{.5 GAUSS}

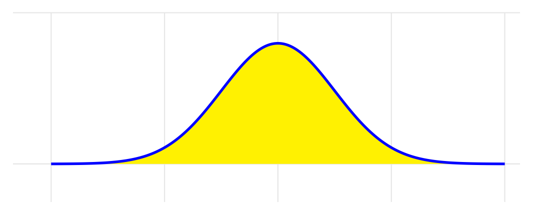


\psIntegral[Simpson=10]{-2}{4}{.5 GAUSS}

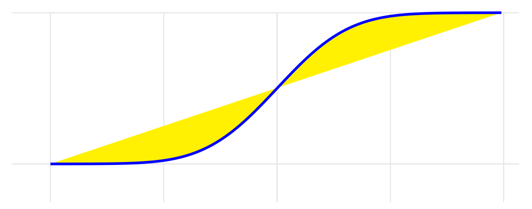


\psplot[linestyle=dashed]{-5}{5}{x abs 2 le 0.50 ifelse}
\psplot[linestyle=dotted]{-5}{5}{x abs 1 le 0.750 ifelse}
\psConv{-5}{5}{(}-6,6) {abs 2 le 0.50 ifelse}{abs 2 le 0.750 ifelse}

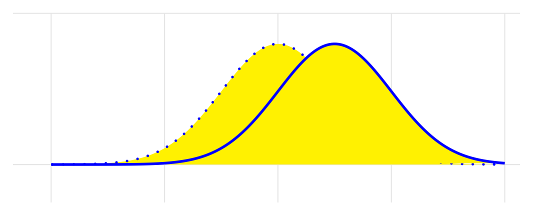
30.12 Loi de Gauss



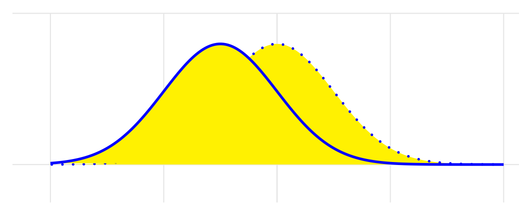
`\psGauss{-2}{2}`



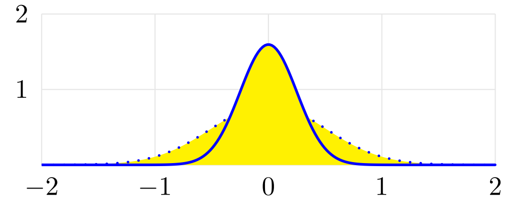
`\psGaussI{-2}{2}`



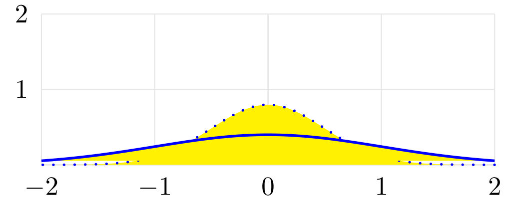
`\psGauss[mue=0.5]{-2}{2}`



`\psGauss[mue=0.5]{-2}{2}`

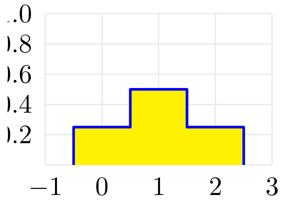
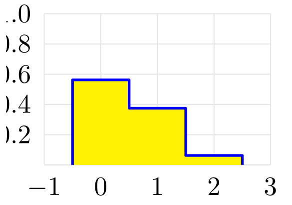
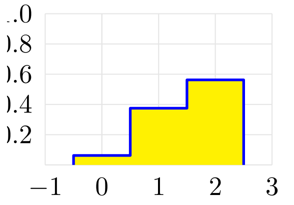


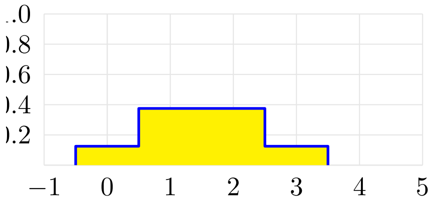
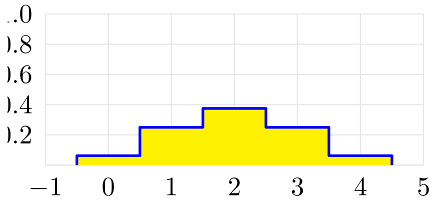
`\psGauss[sigma=0.25]{-2}{2}`

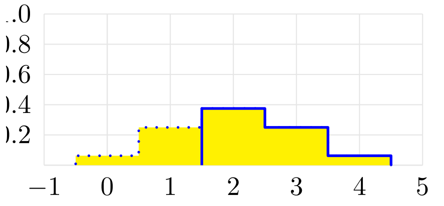
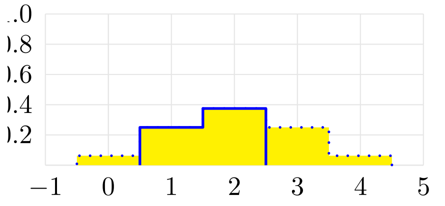


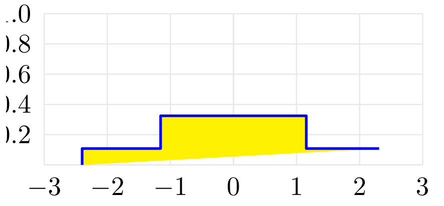
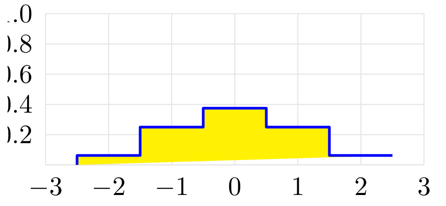
`\psGauss[sigma=1]{-2}{2}`

30.13 Loi binomiale

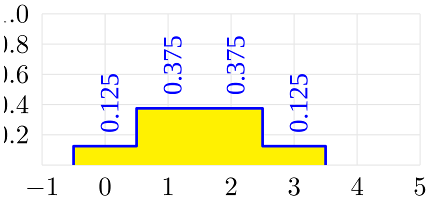
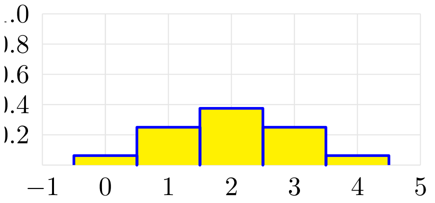
		
\psBinomial{2}{0.5}	\psBinomial{2}{0.25}	\psBinomial{2}{0.75}

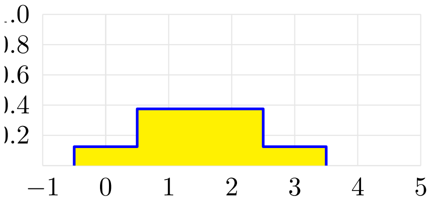
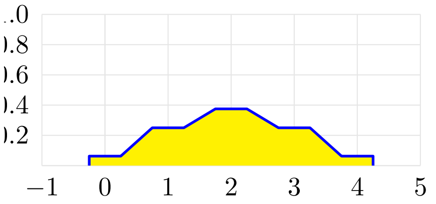
	
\psBinomial{3}{0.5}	\psBinomial{4}{0.5}

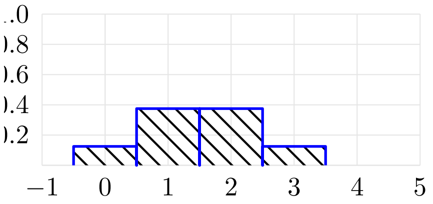
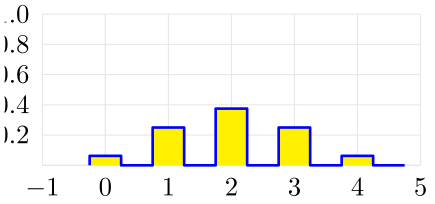
	
\psBinomial{2,4}{0.5}	\psBinomial{1,2,4}{0.5}

	
\psBinomialN{3}{0.5}	\psBinomialN{4}{0.5}

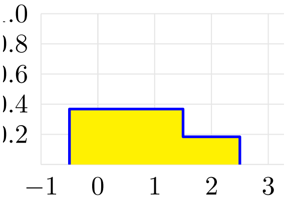
30.13.1 paramètres

	
\psBinomial[printValue]{3}{0.5}	\psBinomial[markZeros]{4}{0.5}

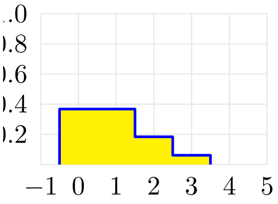
	
\psBinomial[fillcolor=yellow]{3}{0.5}	\psBinomial[barwidth=0.5]{4}{0.5}

	
[fillstyle=vlines,,markZeros]	[barwidth=0.5,markZeros]

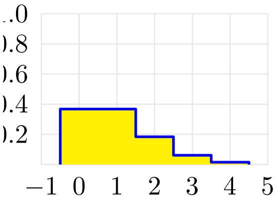
30.14 Loi de Poisson



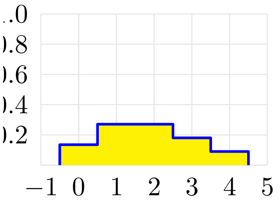
psPoisson{2}{1}



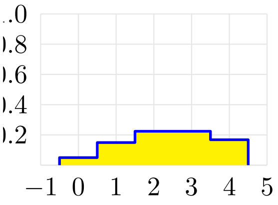
psPoisson{3}{1}



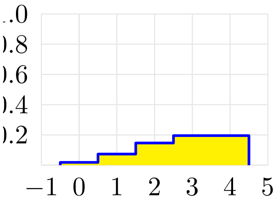
psPoisson{4}{1}



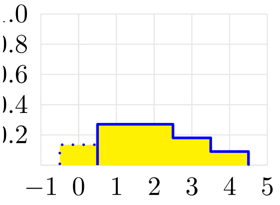
psPoisson{4}{2}



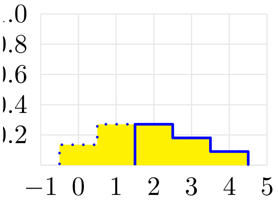
psPoisson{4}{3}



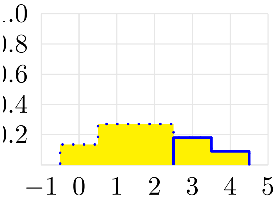
psPoisson{4}{4}



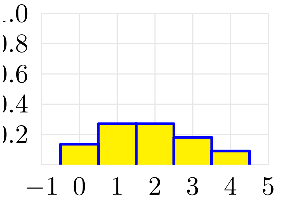
psPoisson{1,4}{2}



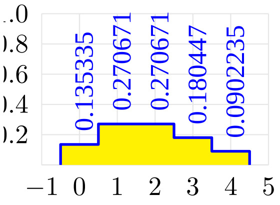
psPoisson{2,4}{2}



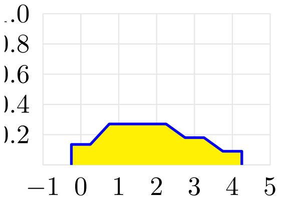
psPoisson{3,4}{2}



\psPoisson[markZeros]{4}{2}

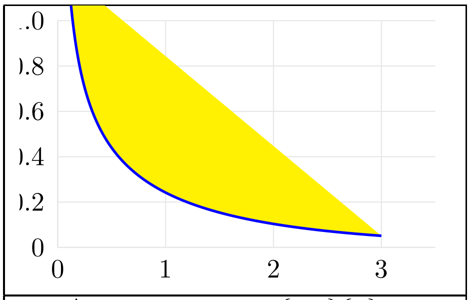


\psPoisson[printValue]{4}{2}

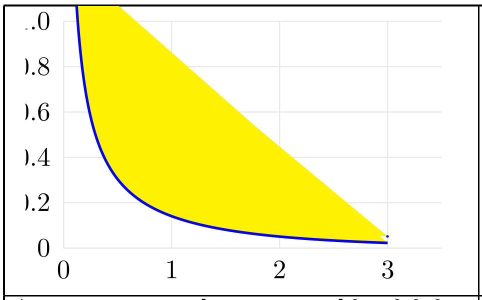


\psPoisson[barwidth=0.5]{4}{2}

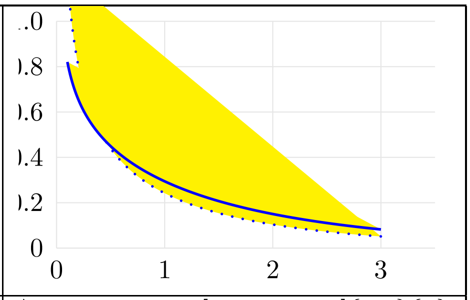
30.15 Loi Gamma



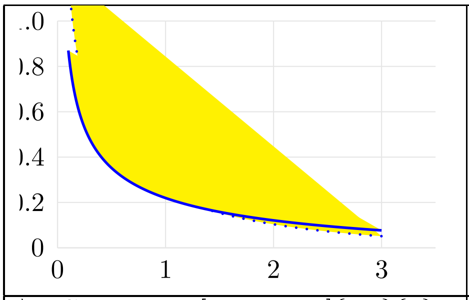
\psGammaDist{0.1}{3}



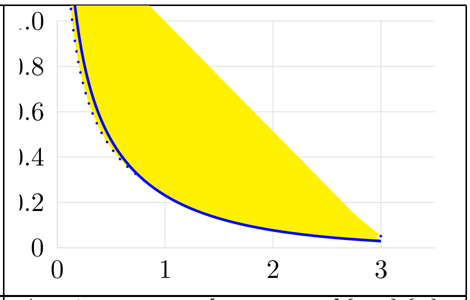
\psGammaDist[alpha=0.25]{0.1}{3}



\psGammaDist[alpha=0.75]{0.1}{3}



\psGammaDist[beta=0.25]{0.1}{3}



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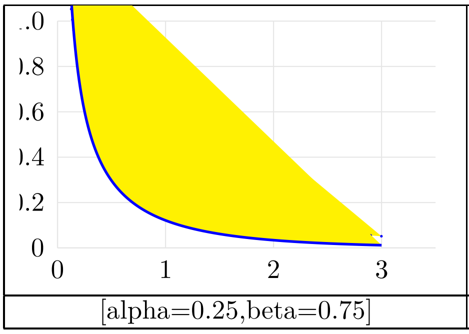
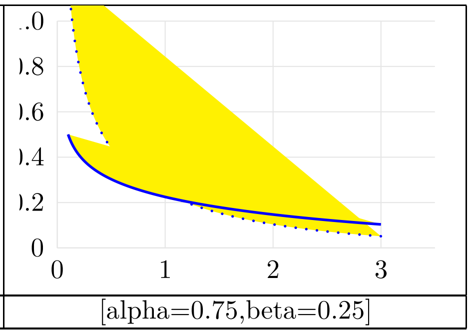
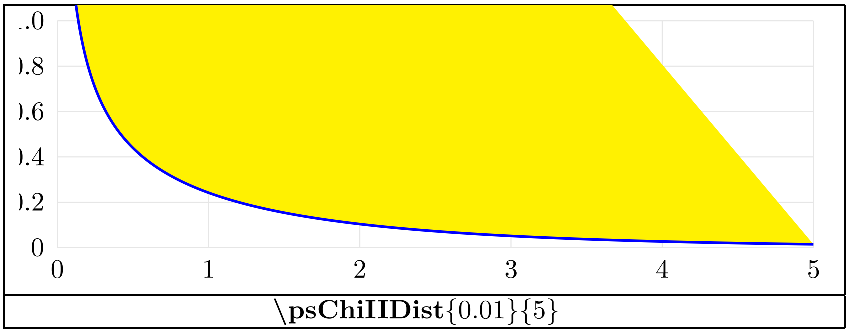


[alpha=0.25,beta=0.75]

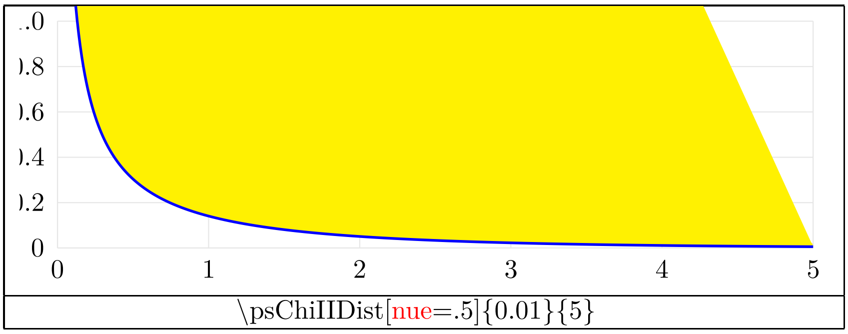


[alpha=0.75,beta=0.25]

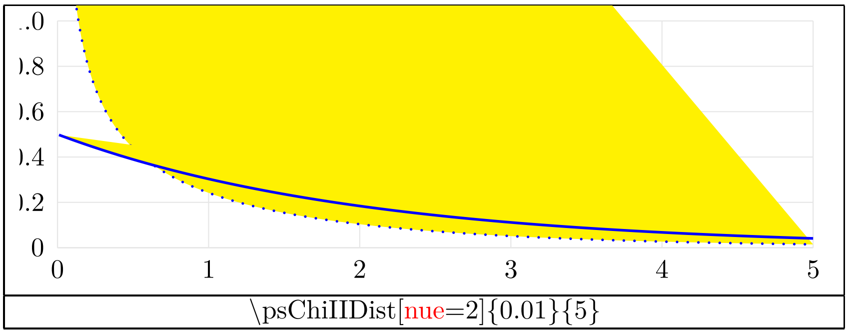
30.16 Loi du χ^2



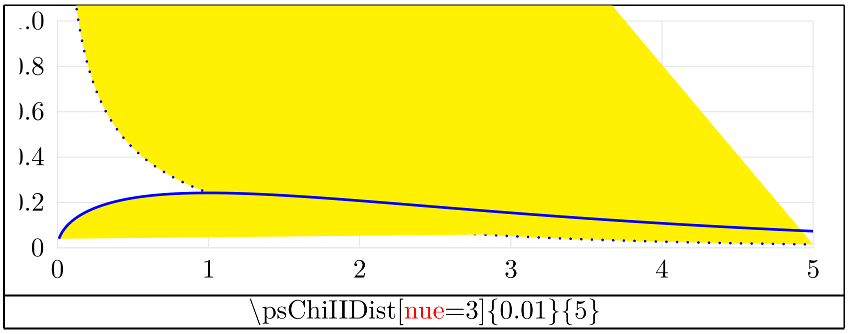
\psChiIIDist{0.01}{5}



\psChiIIDist[nue=.5]{0.01}{5}

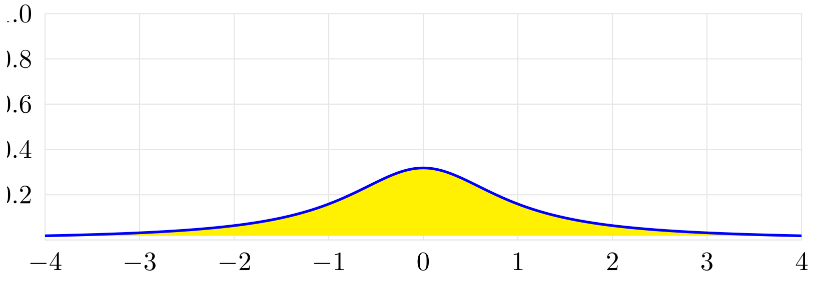


\psChiIIDist[nue=2]{0.01}{5}

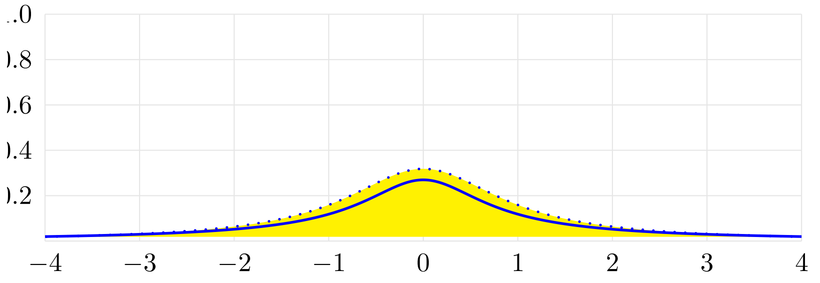


\psChiIIDist[nue=3]{0.01}{5}

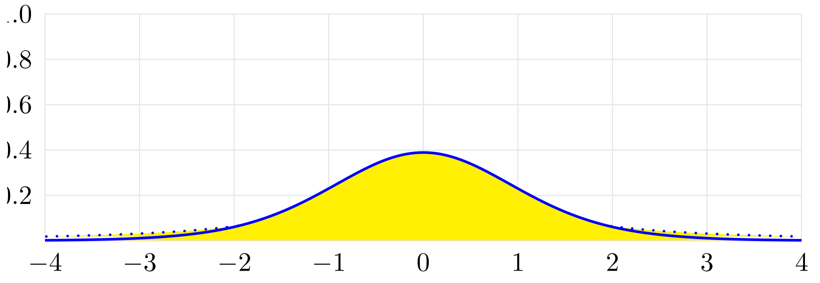
30.17 Loi de Student



\psTDist{4}{4}

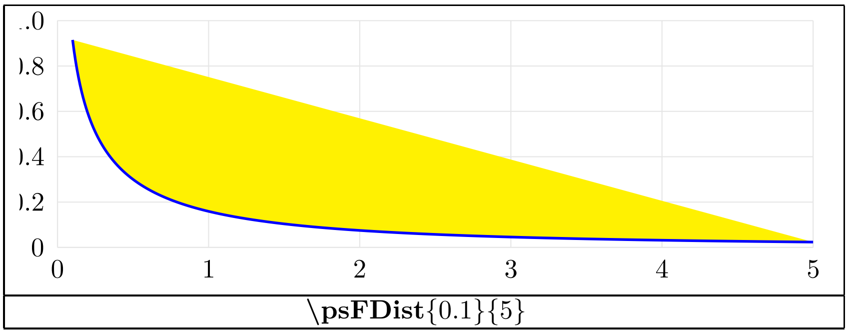


\psTDist[nue=.5]{4}{4}

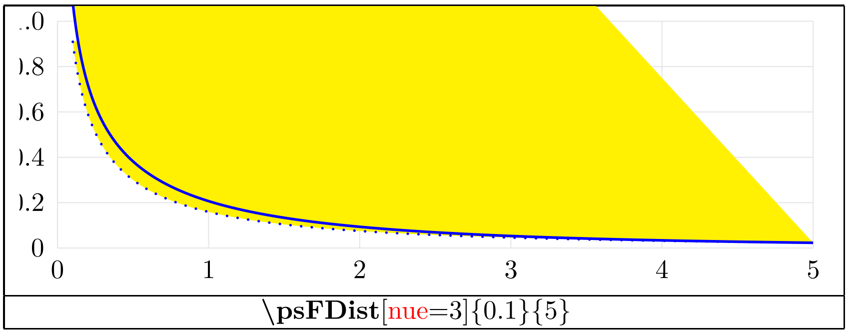


\psTDist[nue=10]{4}{4}

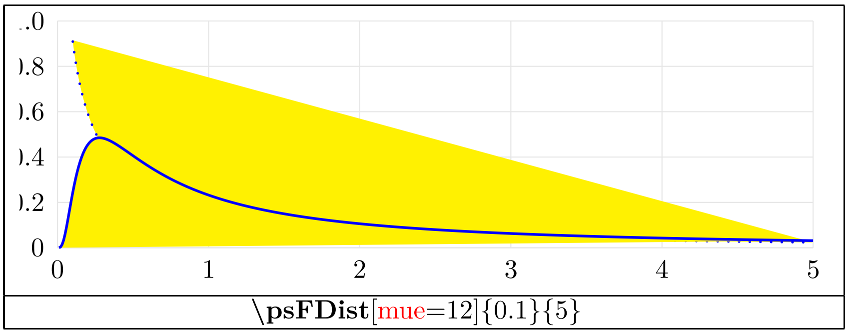
30.18 Loi de F



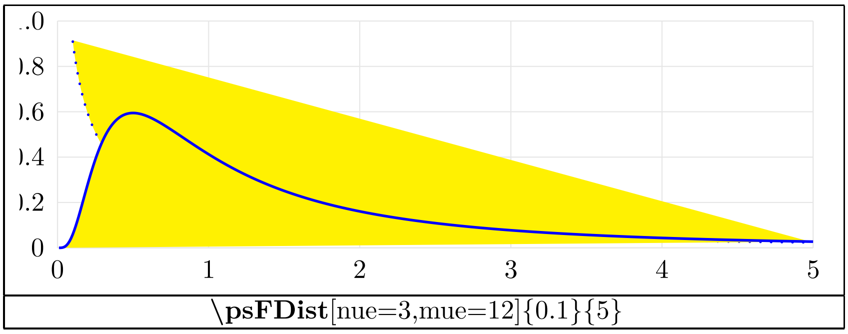
\psFDist{0.1}{5}



\psFDist[nue=3]{0.1}{5}

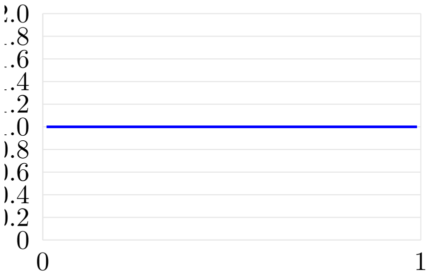


\psFDist[mue=12]{0.1}{5}

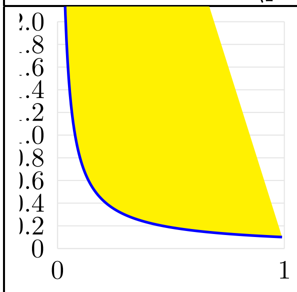
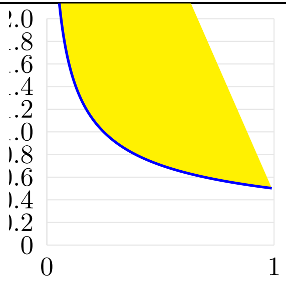
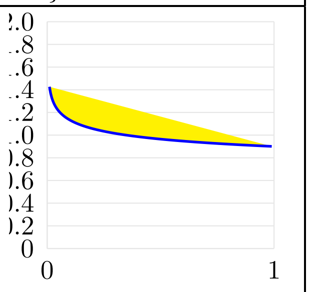


\psFDist[nue=3,mue=12]{0.1}{5}

30.19 Loi de Beta



psBetaDist{0.01}{0.99}

<table>
<tr><td colspan="3">\psBetaDist[alpha=0.1]{0.01}{0.99}</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>[alpha=0.1]</td><td>[alpha=0.5]</td><td>[alpha=0.9]</td></tr>
<tr><td colspan="3">Par défaut : alpha= 1</td></tr>
</table>

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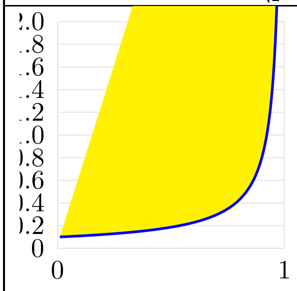
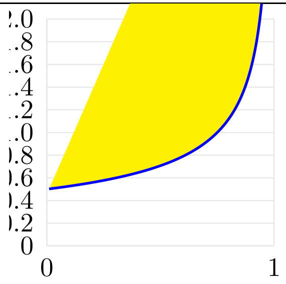
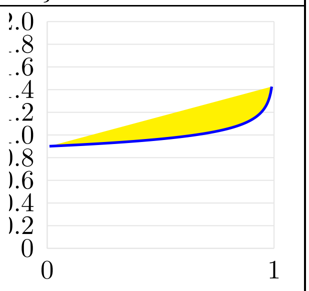
<tr><td></td><td></td><td></td></tr>
<tr><td>[beta=0.1]</td><td>[beta=0.5]</td><td>[beta=0.9]</td></tr>
<tr><td colspan="3">Par défaut : beta= 1</td></tr>
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<table>
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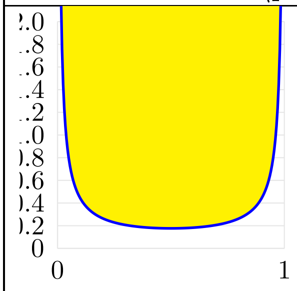
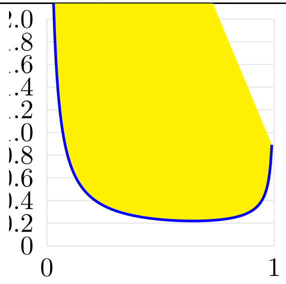
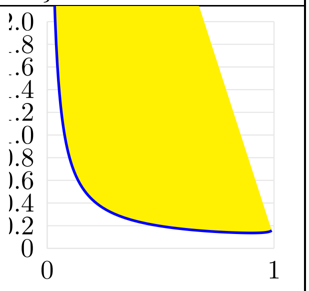
<tr><td></td><td></td><td></td></tr>
<tr><td>[alpha=.1,beta=0.1]</td><td>[alpha=.1,beta=0.5]</td><td>[alpha=.1,beta=0.9]</td></tr>
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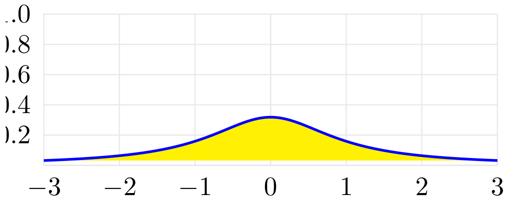
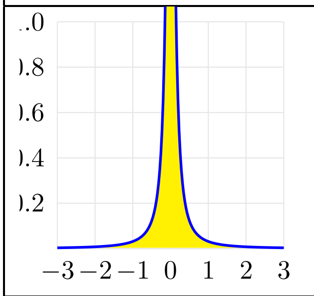
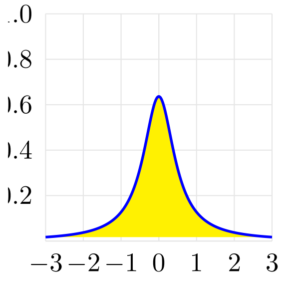
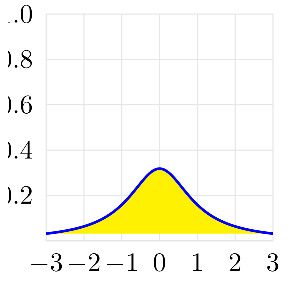
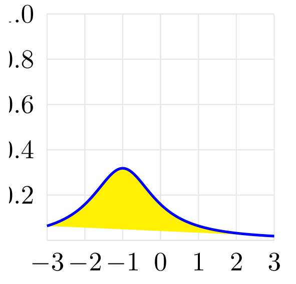
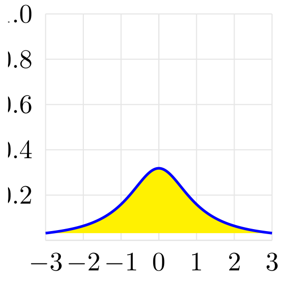
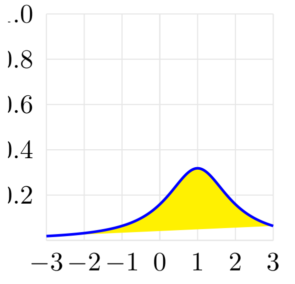
30.20 Loi de Cauchy



\psCauchy{-3}{3}

\psCauchy[b=0.1]{-3}{3}		
		
[b=0.1]]	[b=0.5]	[b=1]
Par défaut : b = 1		

\psCauchy[m=0.1]{-3}{3}		
		
[m=-1]]	[m=0]	[m=1]
Par défaut : m = 0		

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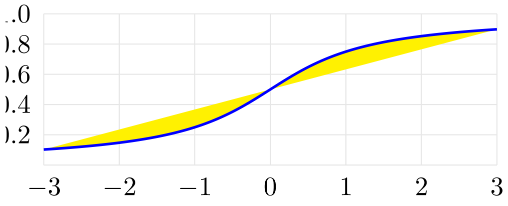
<tr><td>
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<tr><td>\psCauchyI{-3}{3}</td></tr>
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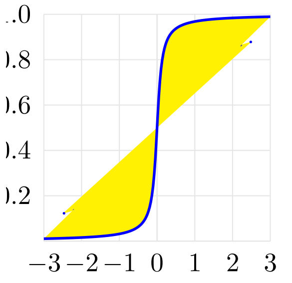
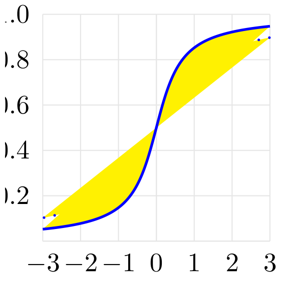
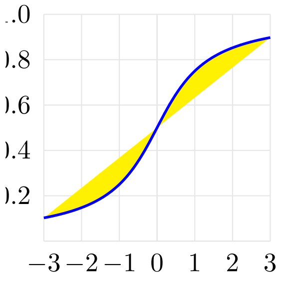
<tr><td>
</td><td>
</td><td>
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<tr><td>[b=0.1]]</td><td>[b=0.5]</td><td>[b=1]</td></tr>
<tr><td colspan="3">Par défaut : b = 1</td></tr>
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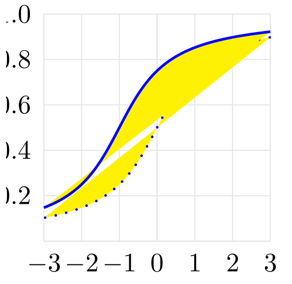
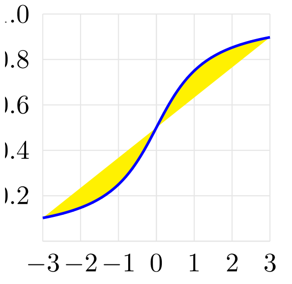
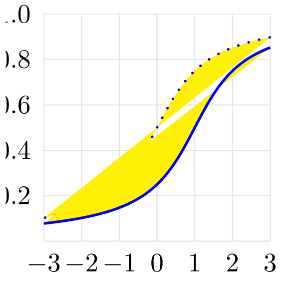
<table>
<tr><td colspan="3">\psCauchyI[m=0.1]{-3}{3}</td></tr>
<tr><td>
</td><td>
</td><td>
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<tr><td>[m=-1]</td><td>[m=0]</td><td>[m=1]</td></tr>
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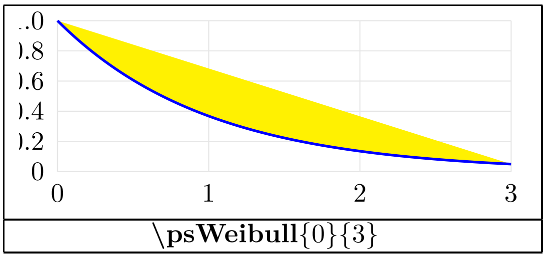
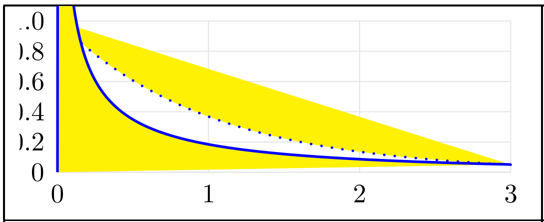
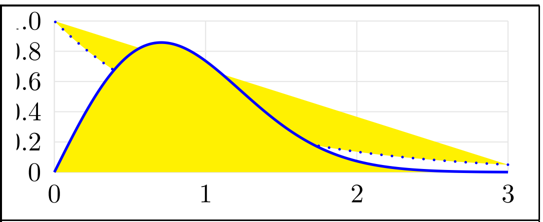
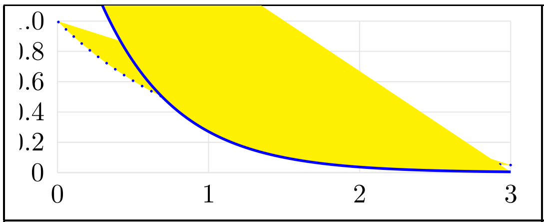
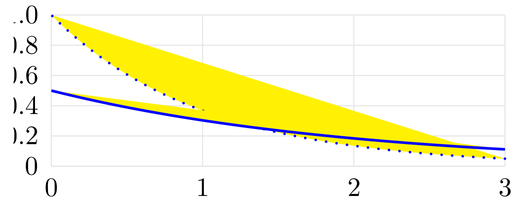
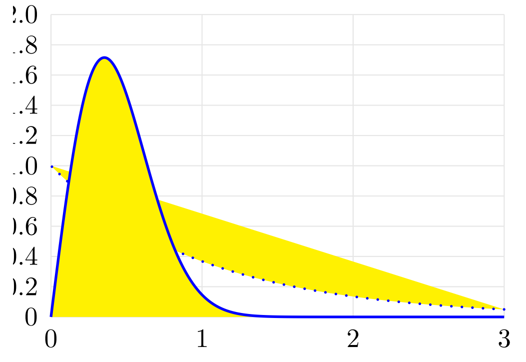
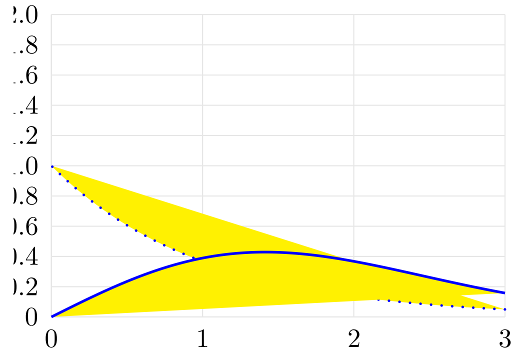
30.21 Loi de Weibull

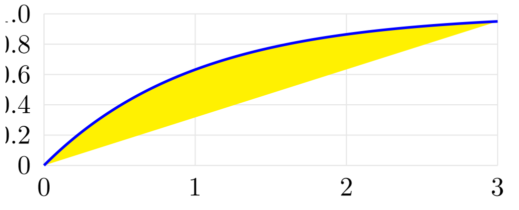


\psWeibull{0}{3}

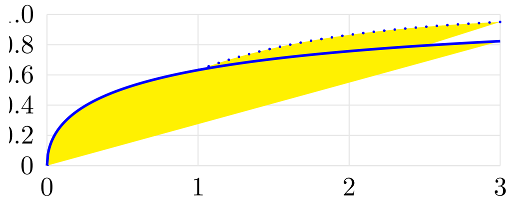
	
\psWeibull[alpha=.5]{0}{3}	\psWeibullalpha=2]{0}{3}
Par défaut : alpha=1	

	
\psWeibull[beta=.5]{0}{3}	\psWeibullbeta=2]{0}{3}
Par défaut :beta=1	

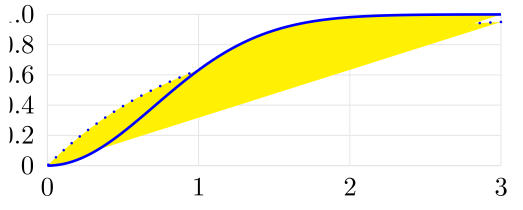
	
\psWeibull[alpha=2,beta=.5]{0}{3}	\psWeibull[alpha=2,beta=2]{0}{3}



\psWeibullI{0}{3}

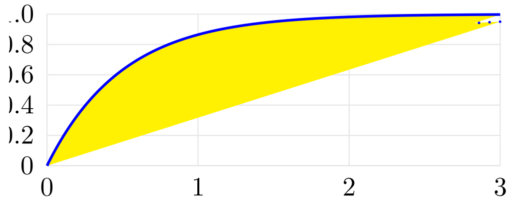


\psWeibullI[alpha=.5]{0}{3}

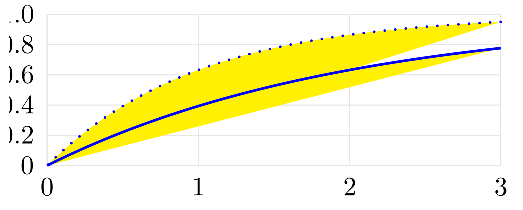


\psWeibullIalpha=2]{0}{3}

Par défaut : alpha=1

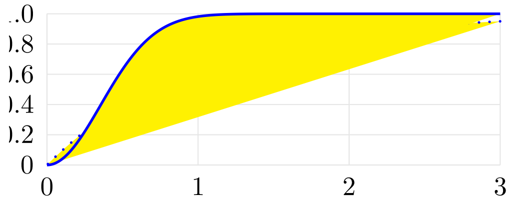


\psWeibullI[beta=.5]{0}{3}

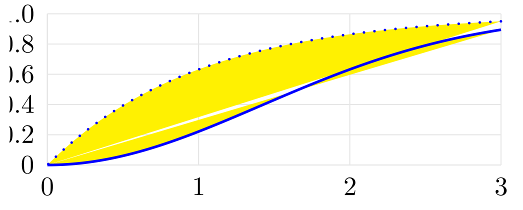


\psWeibullIbeta=2]{0}{3}

Par défaut : beta=1

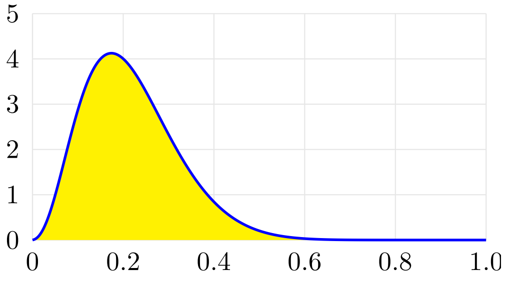


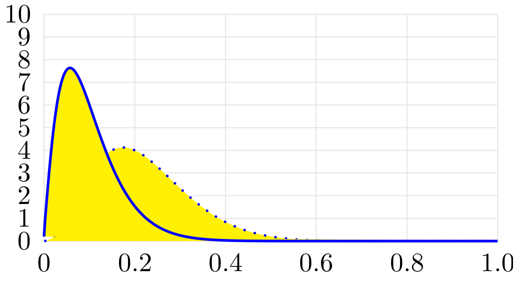
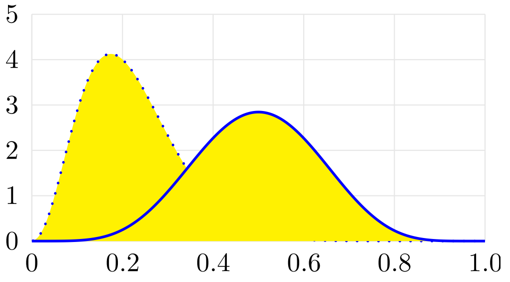
\psWeibullI[alpha=2,beta=.5]{0}{3}

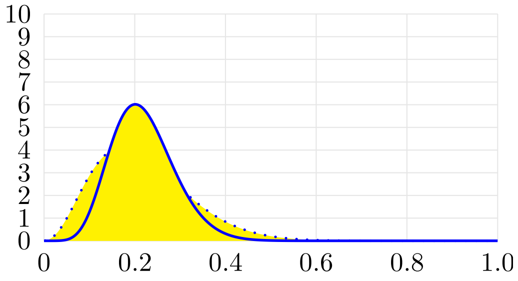
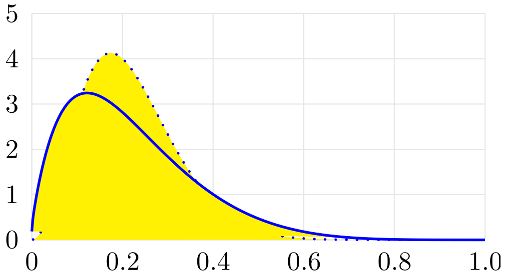


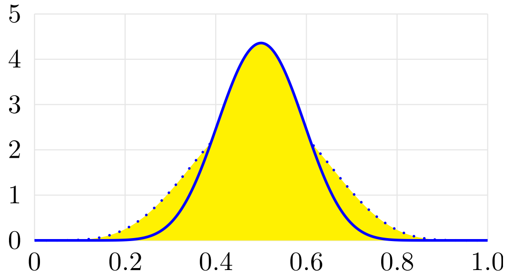
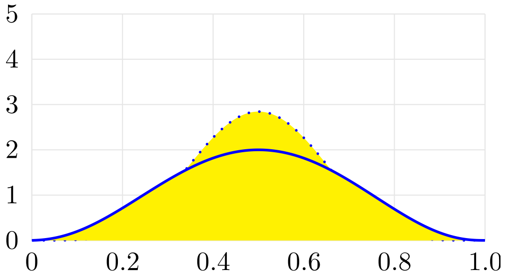
\psWeibullI[alpha=2,beta=2]{0}{3}

30.22 Loi de Vasicek

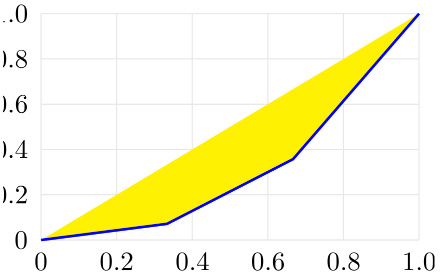
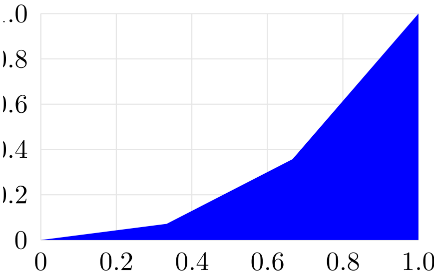

\psVasicek{0}{3}

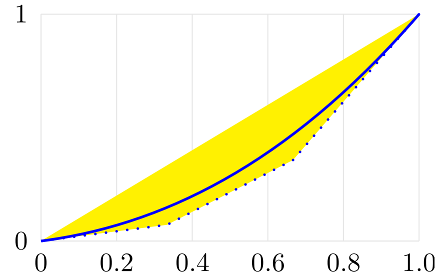
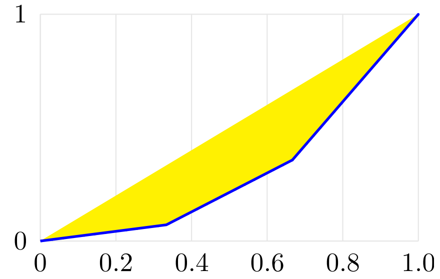
	
\psVasicek[pd=.1]{0}{3}	\psVasicek[pd=.5]{0}{3}
Par défaut : pd = 0.22	

	
\psVasicek[R2=.05]{0}{3}	\psVasicek[R2=.2]{0}{3}
Par défaut : R2 = 0.11	

	
\psVasicek[pd=.5,R2=.05]{0}{3}	\psVasicek[pd=.5,R2=.2]{0}{3}

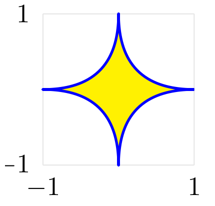
30.23 Courbe de Lorenz

<table>
<tr>
<td>
</td>
<td>
</td>
</tr>
<tr>
<td>\psLorenz{0.1 0.2 0.3}</td>
<td>\psLorenz*{0.1 0.2 0.3 }</td>
</tr>
</table>

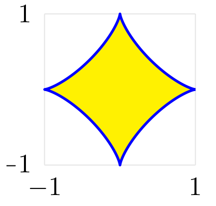
<table>
<tr>
<td>
</td>
<td>

Gini: 0.380952</td>
</tr>
<tr>
<td>\psLorenz[plotstyle=bezier]{.1 .2 .3}</td>
<td>\psLorenz[Gini]{.1 .2 .3 }</td>
</tr>
</table>

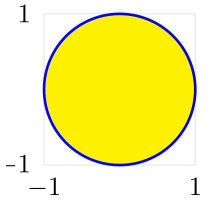
30.24 Courbe de Lamé : superellipses



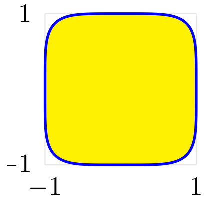
\psLame{.5}



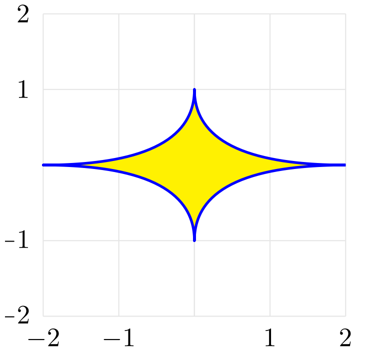
\psLame{.75}



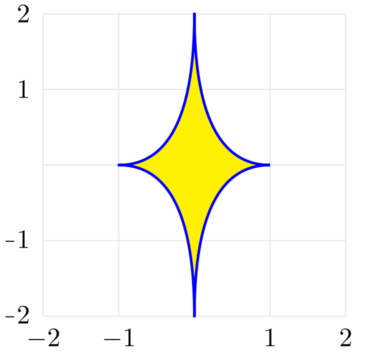
\psLame{2}



\psLame{5}

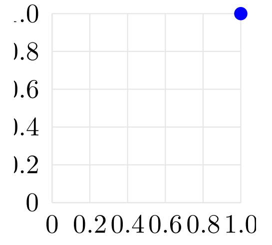


\psLame[radiusA=2]{.5}

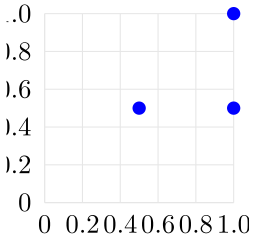


\psLame[radiusB=2]{.5}

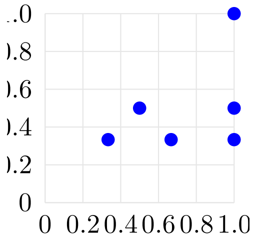
30.25 Fonction de Thomae



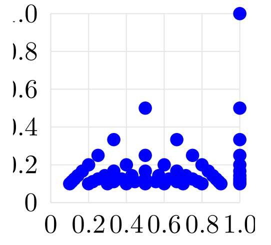
\psThomae(0,1){1}



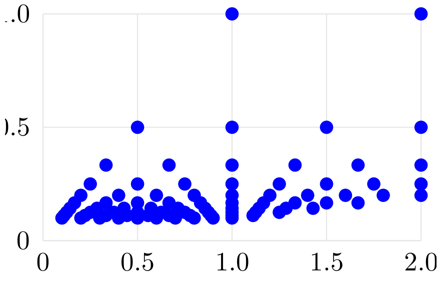
\psThomae(0,1){2}



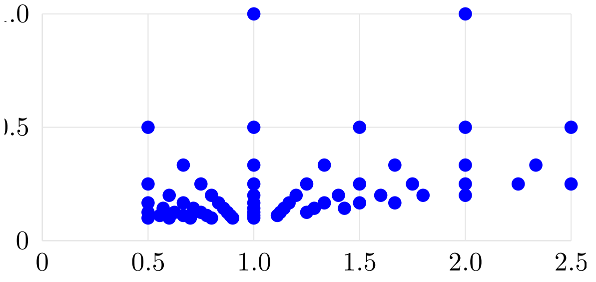
\psThomae(0,1){3}



\psThomae(0,1){10}

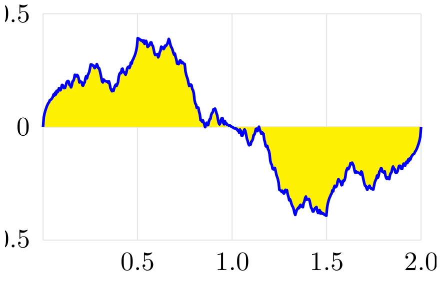


\psThomae(0,2)10(0,2){10}

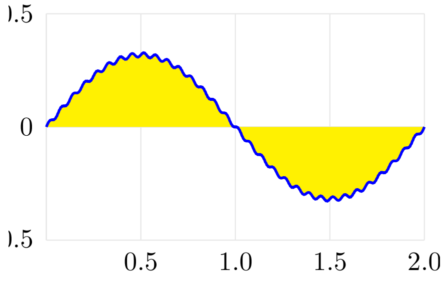


\psThomae(0,2)10(0.5,2){10}

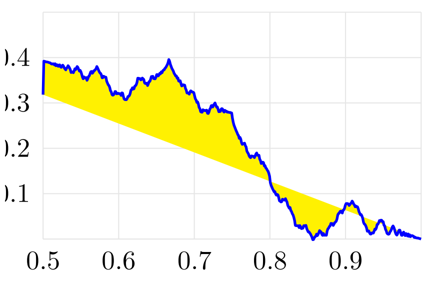
30.26 Fonction de Weierstrass



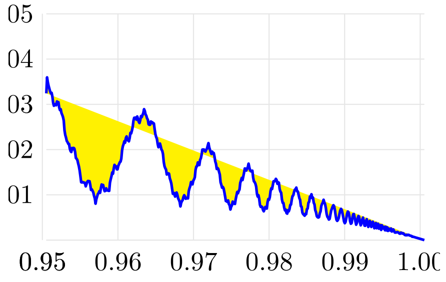
\psWeierstrass(0,2){2}



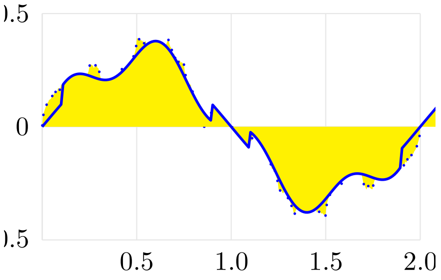
\psWeierstrass(0,2){5}



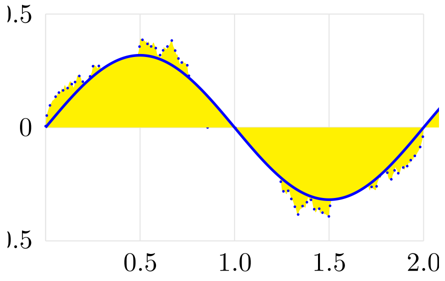
\psWeierstrass(.5,1){2}



\psWeierstrass(.95,1){5}



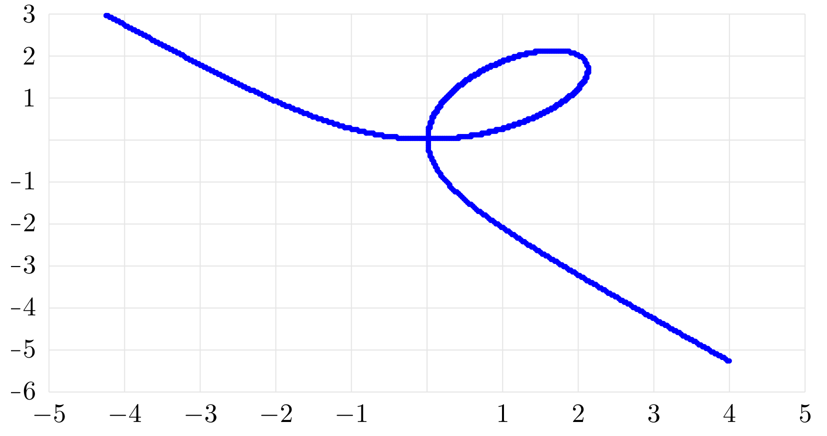
\psWeierstrass[epsilon=1.e-1](0,5){2}



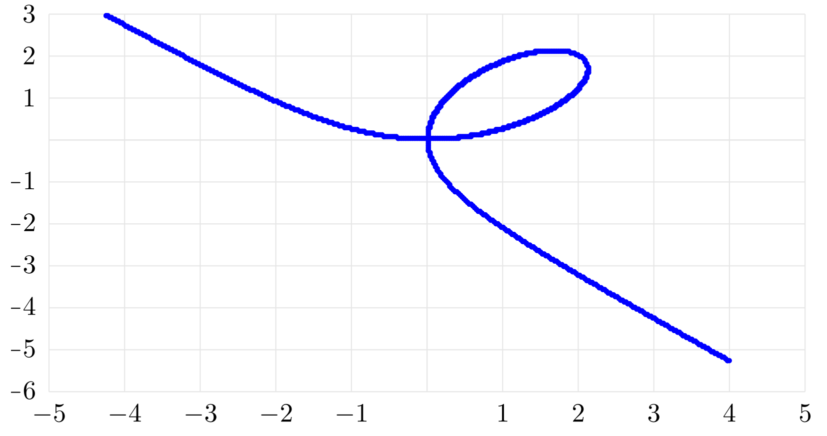
\psWeierstrass[epsilon=1](0,5){2}

Par défaut : epsilon=1.e-18

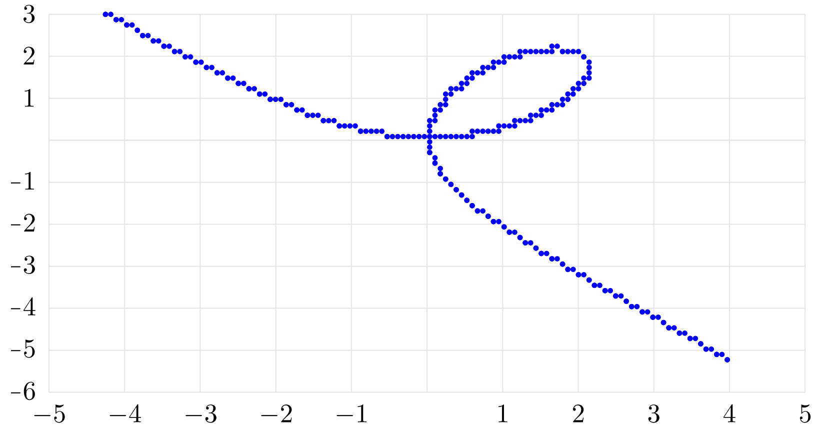
30.27 Fonction définie implicitement



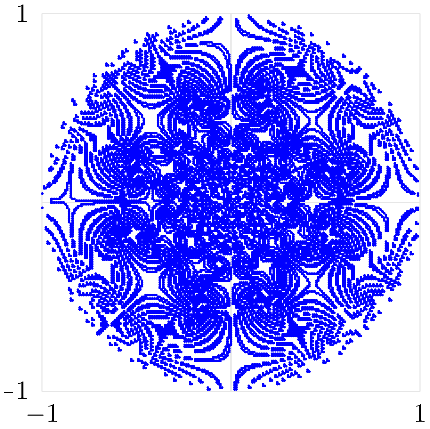
\psplotImp(-6,-7)(4,3){4 x 3 exp y 3 exp add 4 x y mul mul sub }



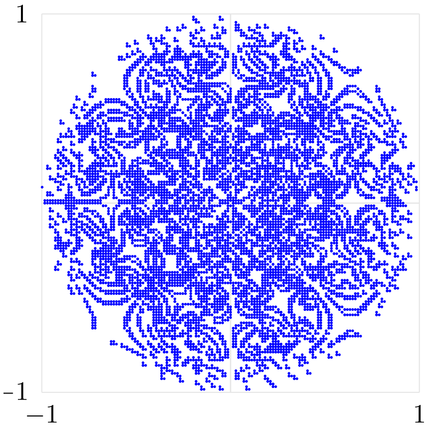
\psplotImp[algebraic](-6,-7)(4,3){x^3 +y^3 -4*x*y }



\psplotImp[algebraic,stepFactor=2](-6,-7)(4,3){x^3 +y^3 -4*x*y }

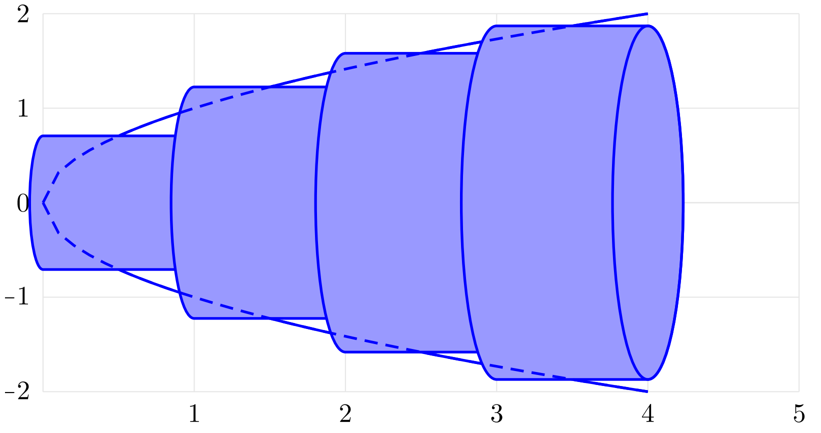


```
\psplotImp[algebraic,polarplot](-1,-1)(1,1){r + cos(10*phi) }
```

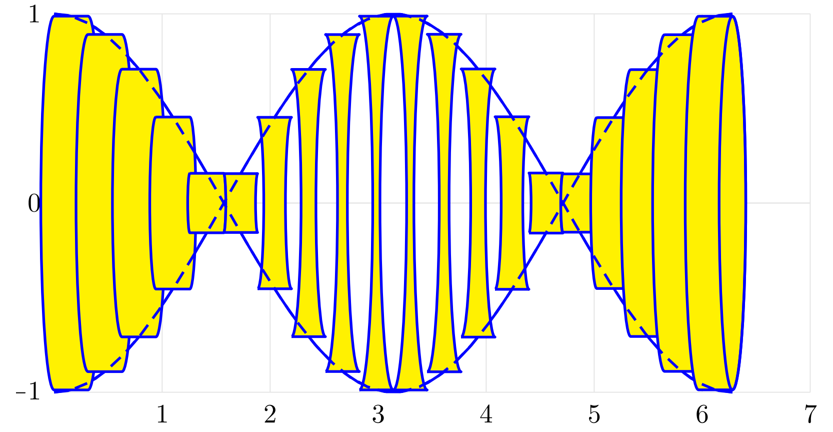


```
\psplotImp[algebraic,polarplot,stepFactor=1](-1,-1)(1,1){r + cos(10*phi) }
```

30.28 Fonction de rotation



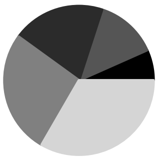
`\psVolume[fillstyle=solid,fillcolor=blue!40](0,4){4}{x sqrt}`

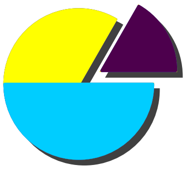


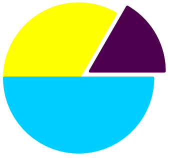
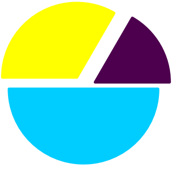
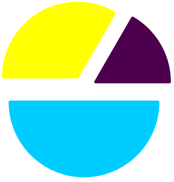
`\psVolume[fillstyle=solid,fillcolor=yellow,algebraic](0,6.28){20}{cos(x)}`

31 Créer un graphe en camembert

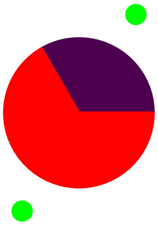
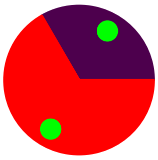
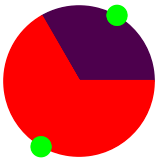
Syntaxe : \psChart[options]{liste de valeurs }{liste des valeurs décalées }{rayon}

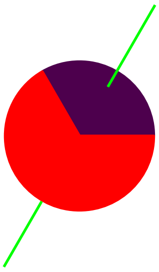
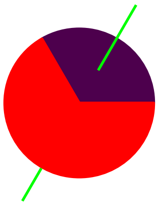
	
\psChart{1,2,3,4,5}{}{1cm}	**\psChart**{1,2,3,4,5}{2,5}{1cm}

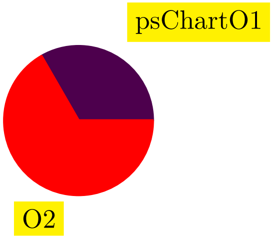
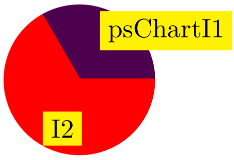
		
chartColor=color	userColor={orange,teal,red!20}	shadow=true

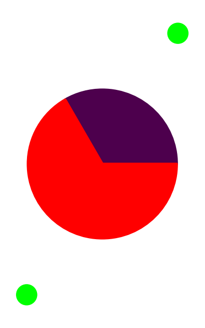
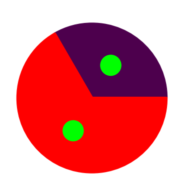
		
chartSep=5pt par défaut : 10pt		

31.1 Etiquettes

3 positions possibles		
		
\psdots(psChartO1) \psdots(psChartO2)	\psdots(psChartI1) \psdots(psChartI2)	\psdots(psChart1) \psdots(psChart2)

Liaison des points	
	
\pcline(psChartO1)(psChartI1) \pcline(psChartO2)(psChart2)	\ncline{psChartO1}{psChartI1} \ncline{psChartO2}{psChart2}

Attachement des étiquettes aux points	
	
\rput*[l](psChartO1){psChartO1} \rput*[l](psChartO2){O2}	\rput*[l](psChartI1){psChartI1} \rput*[l](psChartI2){I2}

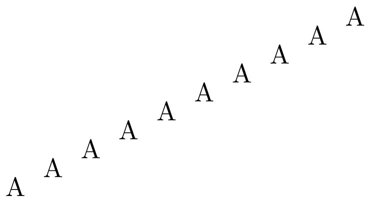
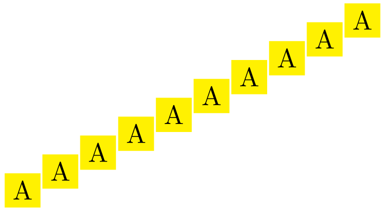
	
chartNodeO=2 par défaut : 1.5	chartNodeI=.5 par défaut : .75

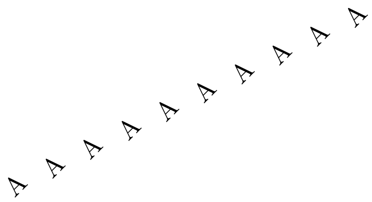
Couleurs de remplissage \psframe[fillcolor=chartFillColor1(1,1) à \psframe[fillcolor=chartFillColor10(1,1)									
🟪	🟥	🟦	🟦	🟩	🟩	🟨	🟥	🟧	🟥

Couleurs complémentaires \psframe[fillcolor=-chartFillColor1(1,1) à \psframe[fillcolor=-chartFillColor10(1,1)									
🟩	🟦	🟥	🟥	🟪	🟪	🟦	🟦	🟦	🟦

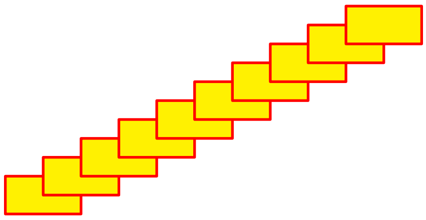
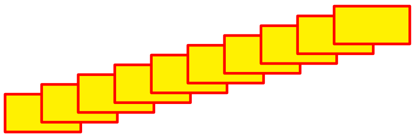
32 Les répétitions

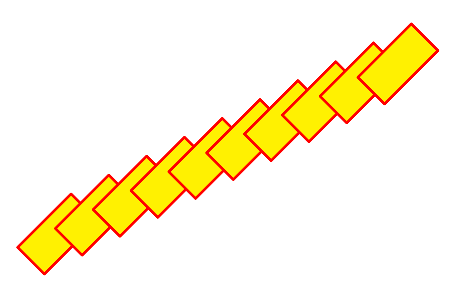
32.1 Multirput [1]

	
\multirput(0.5,0)(0.5,0.25){ 10}{A}	**\multirput***(0.5,0)(0.5,0.25){10}{A}
origine décalage 10 fois	

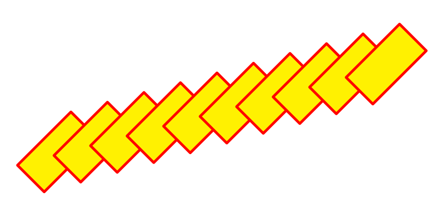
	
\multirput{45}(0.5,0)(0.5,0.25){10}{A}	**\multirput***{45}(0.5,0)(0.5,0.25){10}{A}

32.2 multips [1]

	
\multips(0.5,0)(0.5,0.25){10}{\psframe(1,.5) }	\multips(0.5 ;0)(0.5 ;15){10}{\psframe(1,.5) }
origine décalage 10 fois	coordonnées polaires

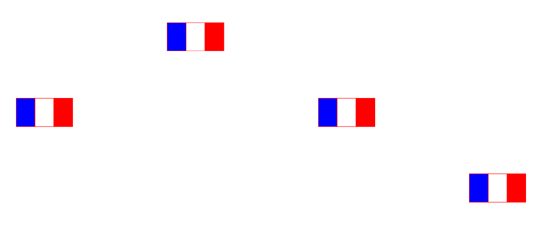


\multips{45}(.5,0)(.5,.25){10}{\psframe(1,.5)}

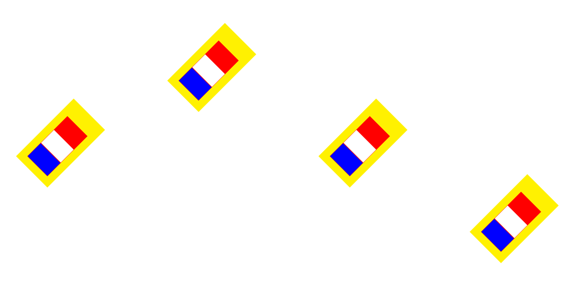


\multips{45}(.5;0)(.5;15){10}{\psframe(1,.5)}

32.3 rmultiput [2]



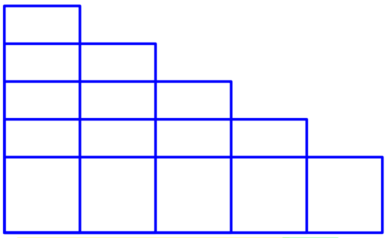
\rmultiput{\DFR}(0,0)(2,1)(4,0)(6,-1)



\rmultiput*[rot=45]{\DFR}(0,0)(2,1)(4,0)(6,-1)

32.4 Multido [1] [24]

Utilisation du module **multido**

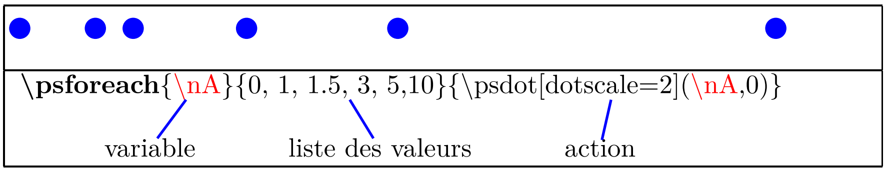


\multido {\i=1+1,\n=3.+-0.5}{5}{\psframe(\i,\n)}

variable = valeur initiale+incrément 5 fois utilisation

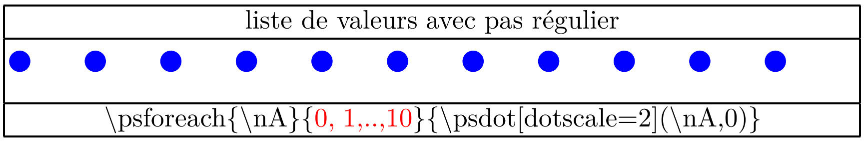
Types de variables	
initiale	dimension
d ou D	longueur
i ou I	nombre entier
n ou N	nombre réel (même nombre de décimales)
r ou R	Réel (4 chiffres maxima de part et d'autre)

32.5 Commande psforeach [15]



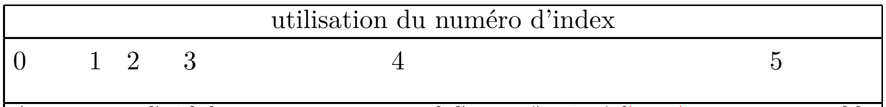
```
\psforeach{\nA}{0, 1, 1.5, 3, 5,10}{\psdot[dotscale=2](\nA,0)}
```

liste de valeurs avec pas régulier



```
\psforeach{\nA}{0, 1,..,10}{\psdot[dotscale=2](\nA,0)}
```

utilisation du numéro d'index



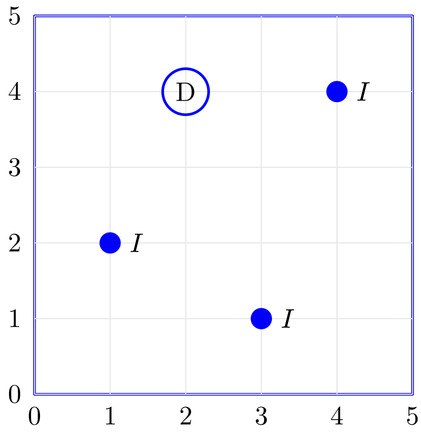
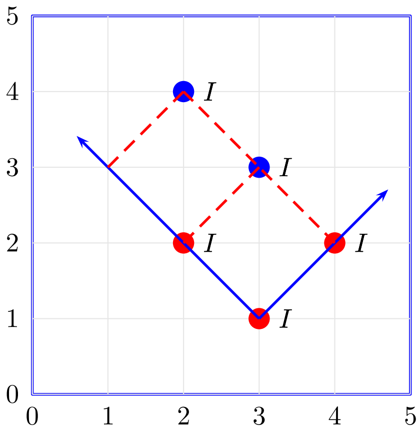
```
\psforeach{\A}{0, 1, 1.5, 2.25, 5,10}{\rput(\nA,0){\the\psLoopIndex}}
```

33 La géométrie

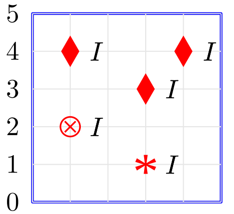
Utilisation du module **pst-eucl** (consultez le fichier **pst-eucl-doc.pdf**)

33.1 Élements de base

33.1.1 Points

axes par défaut	axes personnalisés
	
pstGeonode(1,2){A}(3,1){A_1}(4,4){C} **cnodeput**{0}(2,4){D}{D} [1]	\pstGeonode(3,1){A}(2,2){B}(4,2){C} **pstOIJGeonode**(1,1){E}{A}{B}{C} (2,1){D}

Types de points			
paramètre	exemple [2]	paramètre	exemple
*	● *I*	o	○ *I*
+	+ *I*	x	× *I*
asterisk	∗ *I*	oplus	⊕ *I*
otimes	⊗ *I*	|	| *I*
triangle	△ *I*	triangle*	▲ *I*
square	□ *I*	square*	■ *I*
diamond	◇ *I*	diamond*	◆ *I*
pentagon	⬠ *I*	pentagon*	⬟ *I*


\pstGeonode[PointSymbol={otimes,asterisk,diamond*}] (1,2){A}(3,1){B}(4,4){C}(3,3){D}(1,4){E}

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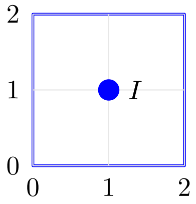
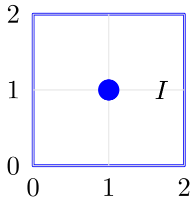
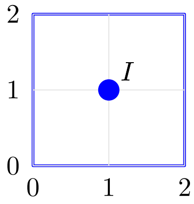
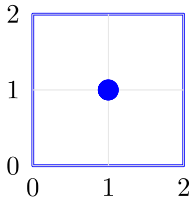
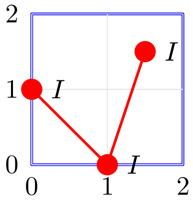
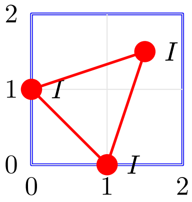
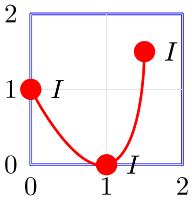
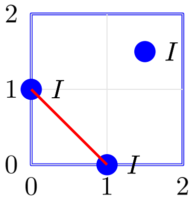
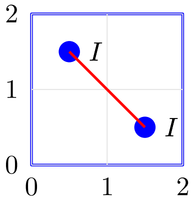
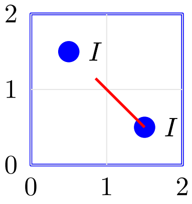
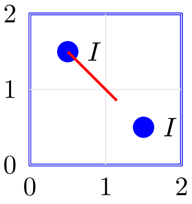
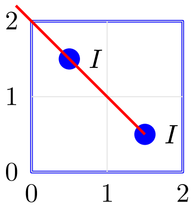
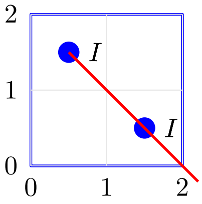
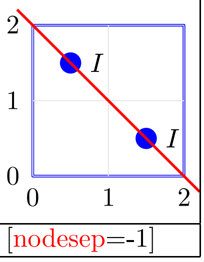
1. On peut aussi utiliser les nœuds du module **pstnode** page 37
2. linecolor=blue,fillcolor=yellow,dotscale=2

\pstGeonode[PointNameSep=.7cm](1,1){A}			
			
Par défaut	PointNameSep=.7cm	PosAngle=45	PointName=none
	Par défaut= 1em	Par défaut= 0	

\pstGeonode[CurveType=polyline](0,1){A}(1,0){B}(1.5,1.5){C}			
			
CurveType=polyline	CurveType=polygon	CurveType=curve	**ncline**{A}{B} [1]

33.1.2 Droites et segments de droite

pstLineAB[nodesepA=.5]{A}{B}		
		
Par défaut	[nodesepA=0.5]	[nodesepB=0.5]
		
[nodesepA=-1]	[nodesepB=-1]	[nodesep=-1]

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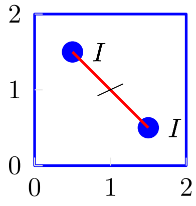
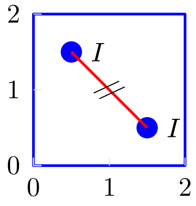
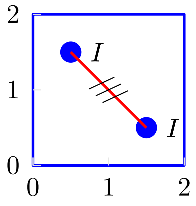
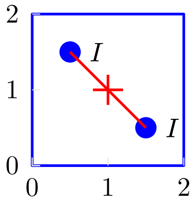
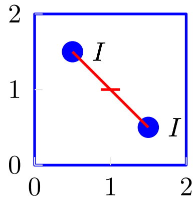
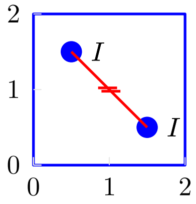
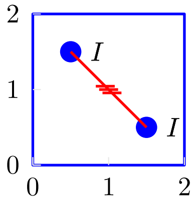
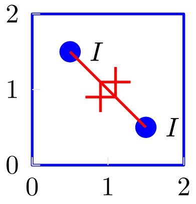
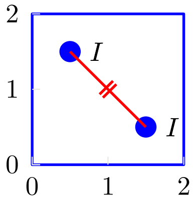
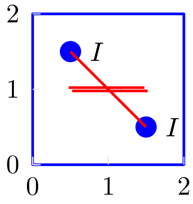
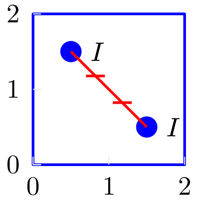
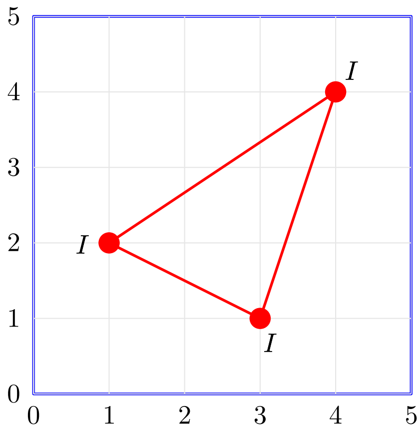
[1] On peut aussi utiliser les liaisons des noeuds voir page 40

33.1.3 Marquage des droites

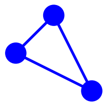
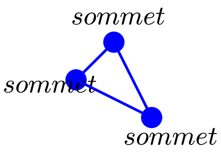
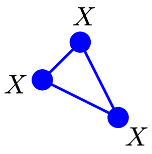
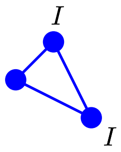
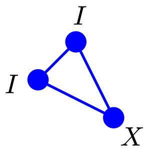
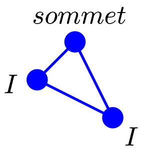
\pstSegmentMark[SegmentSymbol=pstslash]{A}{B}			
			
pstslash [6]	pstslashh [6]	pstslashhh [6]	MarkCros [6]
			
MarkHash [6]	MarkHashh [6]	MarkHashhh [6]	MarkCross [6]

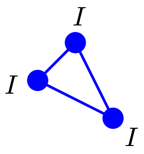
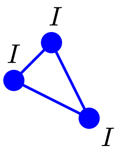
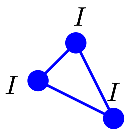
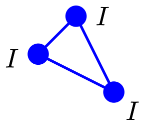
\pstSegmentMark[MarkAngle=90]{A}{B}		
		
MarkAngle=90	MarkHashLength=.5	MarkHashSep=.5
Par défaut : 45	Par défaut : 1.25mm	Par défaut : .625mm

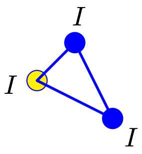
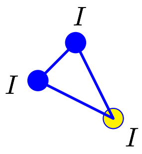
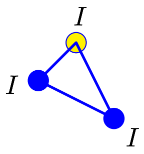
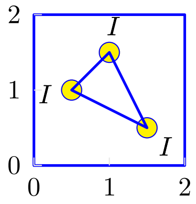
33.1.4 Triangles



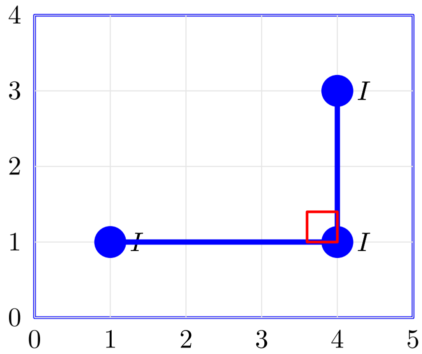
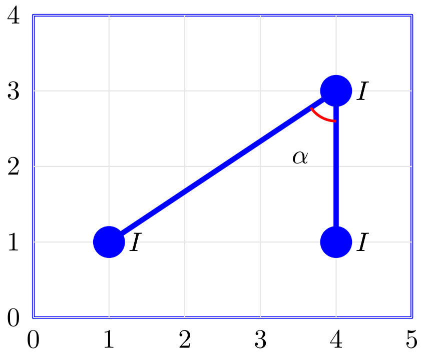
\pstTriangle(1,2){A}(3,1){P}(4,4){Z}

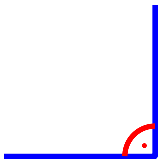
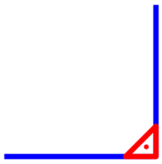
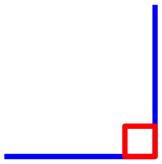
\pstTriangle[PointName=none](0.5,1){A}(1.5,0.5){B}(1,1.5){C}		
		
PointName=none	PointName=sommet	» A REVOIR «
		
PointNameA=none	PointNameB=X	PointNameC=sommet

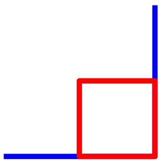
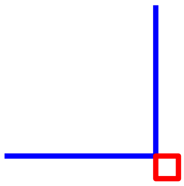
\pstTriangle[PosAngle=45](0.5,1){A}(1.5,0.5){B}(1,1.5){C}			
			
PosAngle=180	PosAngleA=90	PosAngleB=90	PosAngleC=0
Par défaut : sur la bissectrice			

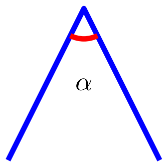
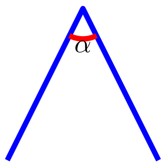
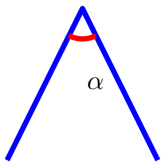
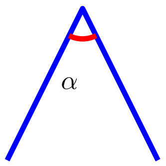
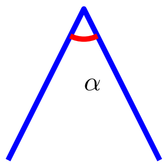
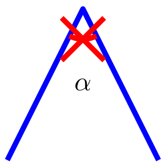
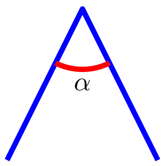
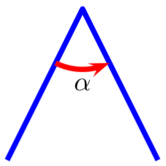
\pstTriangle[PointSymbolA=o](0.5,1){A}(1.5,0.5){B}(1,1.5){C}			
			
PointSymbolA=o	PointSymbolB=o	PointSymbolC=o	PointSymbol=o

33.1.5 Angles

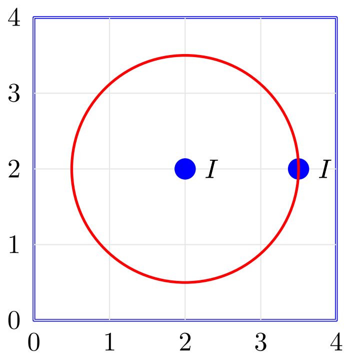
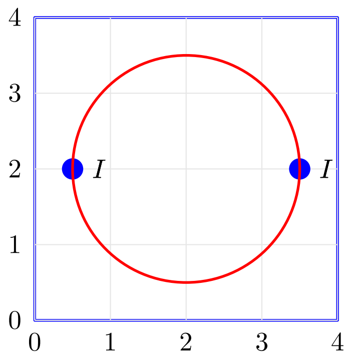
	
\pstRightAngle{A}{B}{C}	**\pstMarkAngle**{A}{C}{B}{α}

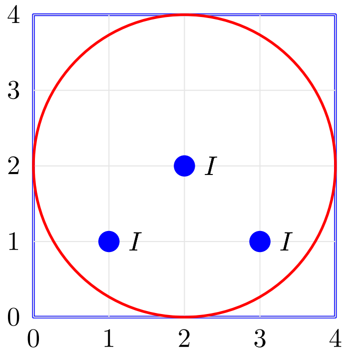
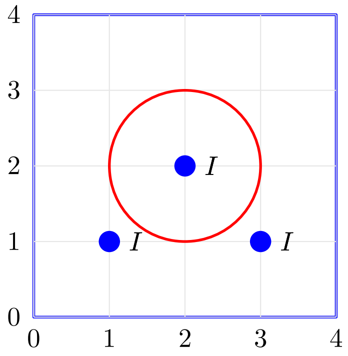
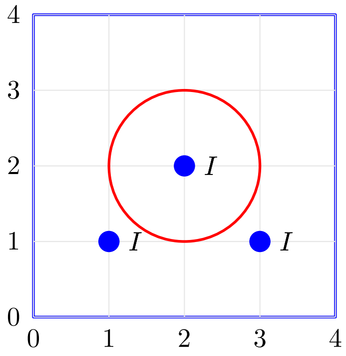
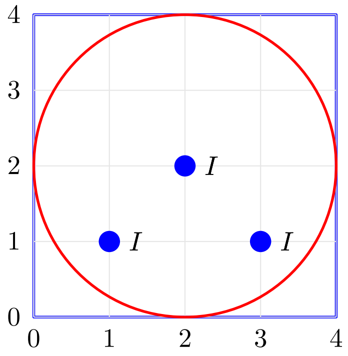
\pstRightAngle[linecolor=red,RightAngleType=german]{C}{B}{A}		
		
RightAngleType= german [6]	RightAngleType=suisseromand [6]	Par défaut

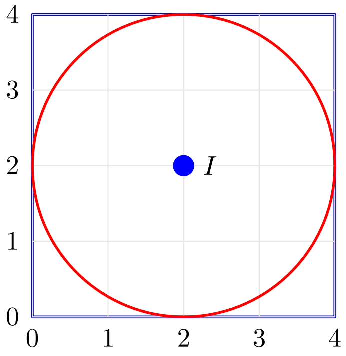
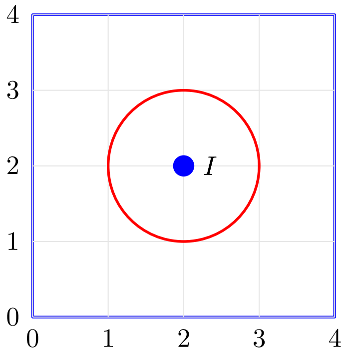
\pstRightAngle[linecolor=red,RightAngleSize=1]{C}{B}{A}	
	
RightAngleSize=1	RightAngleSize=-.3
Par défaut : RightAngleSize = 0.28 unit	

\pstMarkAngle[LabelSep=.5]{A}{C}{B}{α}			
			
Par défaut	LabelSep=.3cm	LabelAngleOffset=10	LabelAngleOffset=-10
	Par défaut : 1	Par défaut : 0	Par défaut : 0
			
LabelRefPt=l	Mark=MarkCros	MarkAngleRadius=.8	arrows=->
Par défaut : c		Par défaut : .4	,MarkAngleRadius=.8

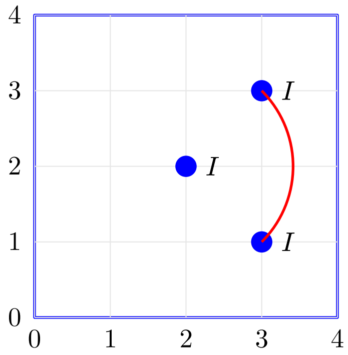
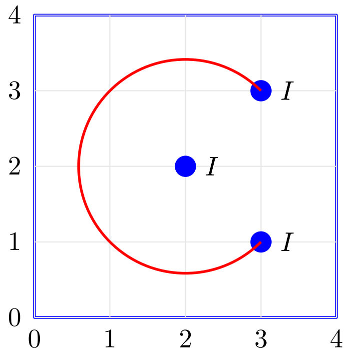
33.1.6 Cercles

	
\pstCircleOA{A}{B}	**\pstCircleAB**{A}{B}

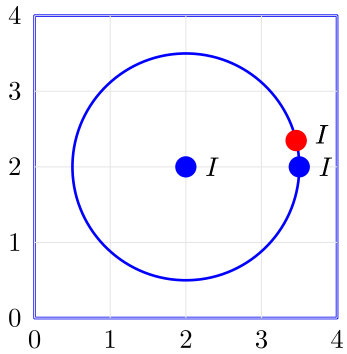
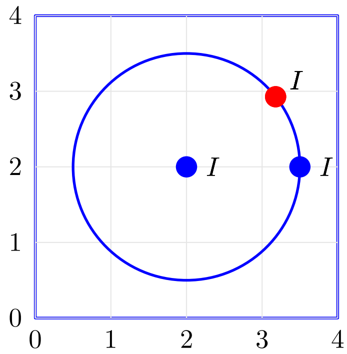
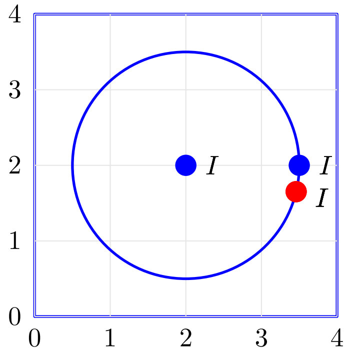
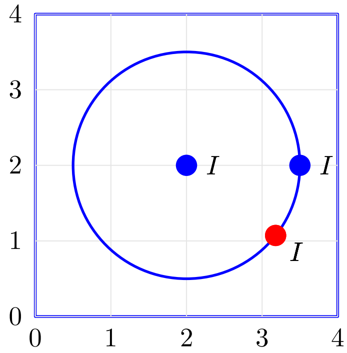
	
\pstCircleOA[Radius=pstDistAB{B}{C}] {A}{}	\pstCircleOA[Diameter=pstDistAB{B}{C}] {A}{}
	
\pstCircleOA[DistCoef=.5 Radius=pstDistAB{B}{C}] {A}{}	\pstCircleOA[DistCoef=2 Diameter=pstDistAB {B}{C}] {A}{}

	
\pstCircleOA[Radius=pstDistVal{2}]{A}{} [6]	\pstCircleOA[Diameter=pstDistVal{2}]{A}{}

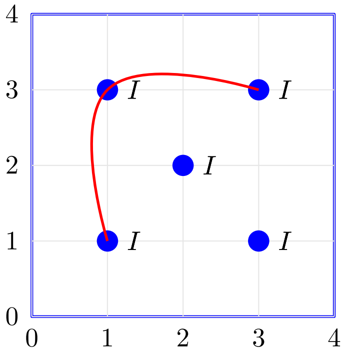
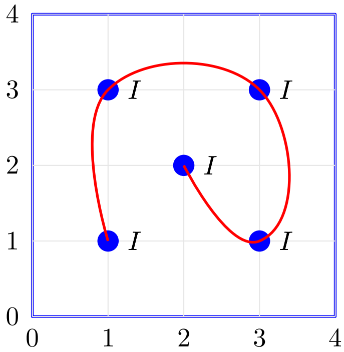
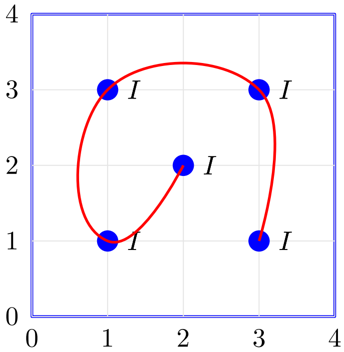
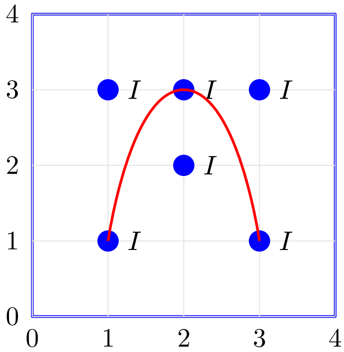
33.1.7 Arcs de cercle

	
\pstArcOAB{A}{B}{C}	**\pstArcnOAB**{A}{B}{C}

33.2 Point sur cercle

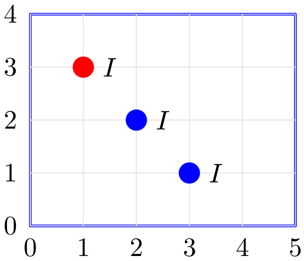
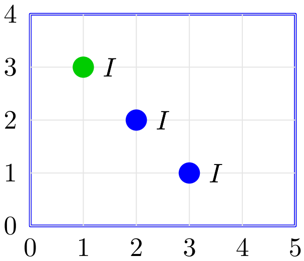
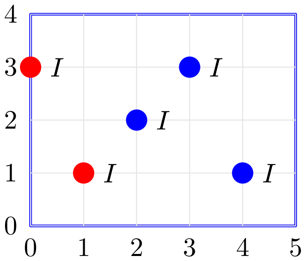
	
\pstCurvAbsNode{A}{B}{C} {10}	**\pstCurvAbsNode**{A}{B}{C} {**\pstDistVal**{1}}
	
\pstCurvAbsNode [CurvAbsNeg=true] {A}{B}{C} {10}	**\pstCurvAbsNode** [CurvAbsNeg=true] {A}{B}{C} {**\pstDistVal**{1}}

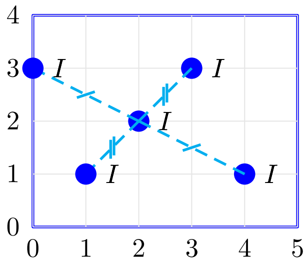
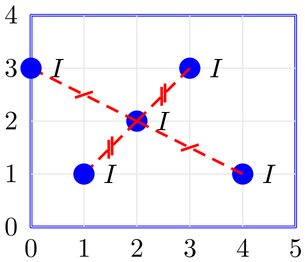
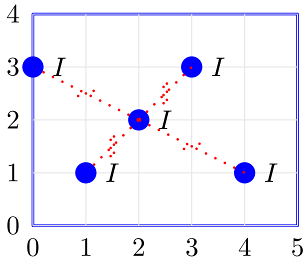
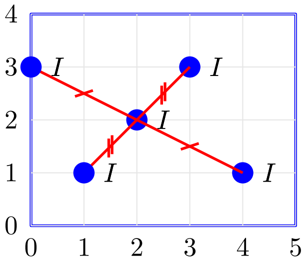
33.2.1 Courbe générique

\pstGeonode(2,2){A} (3,1){B_1} (3,3){B_2} (1,3){B_3} {(}1,1)B_4	
	
\pstGenericCurve{B_}{2}{4}	\pstGenericCurve [GenCurvFirst=A] {B_}{1}{4}
	
\pstGenericCurve[GenCurvLast=A] {B_}{1}{4}	\pstGenericCurve[GenCurvInc=2] {B_}{1}{5}

33.3 Transformations géométriques

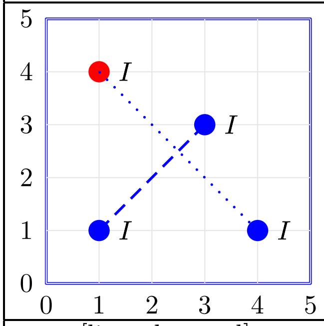
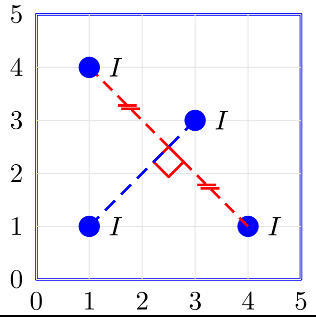
33.3.1 Symétrie par rapport à un point

		
\pstSymO[linecolor=red] {A}{B}	**\pstSymO**[linecolor=Vert] {A}{B}[D]	**\pstSymO**[linecolor=red] {A}{B,C}[D,E]

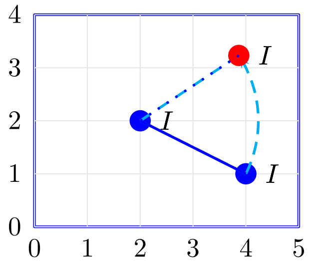
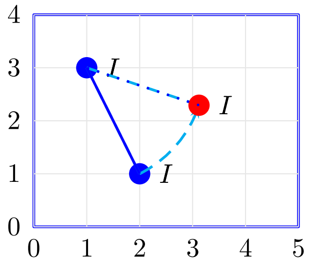
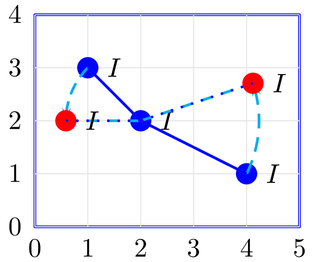
	
\pstSymO[CodeFig=true] {A}{B,C}[D,E]	\pstSymO[CodeFig=true,CodeFigColor=red] {A}{B,C}[D,E]
Par défaut : CodeFig = false	Par défaut : CodeFigColor = cyan
	
\pstSymO[CodeFig=true,CodeFigStyle=dotted] {A}{B,C}[D,E]	\pstSymO[CodeFig=true,CodeFigStyle=solid] {A}{B,C}[D,E]
Par défaut : CodeFigStyle = dashed	

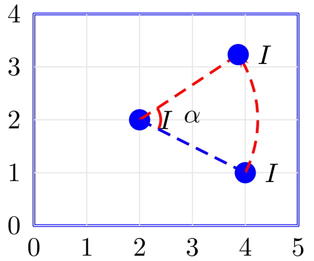
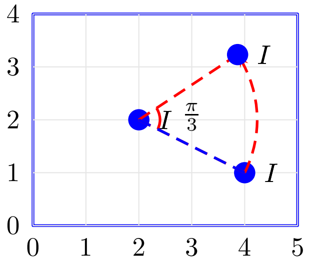
Autres options possibles : PointSymbol PosAngle PointName PointNameSep PtNameMath

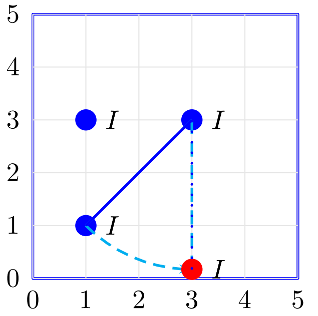
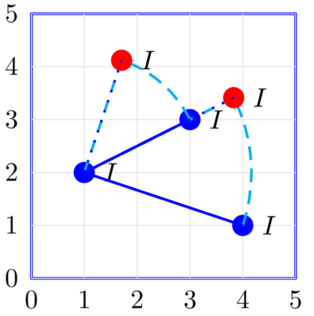
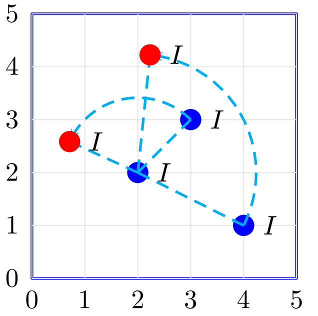
33.3.2 Symétrie par rapport à une droite

\pstOrtSym[options]{A}{B}{C}	
	
[linecolor=red]	[CodeFig=true,CodeFigColor=red]
	Par défaut : CodeFigColor=cyan

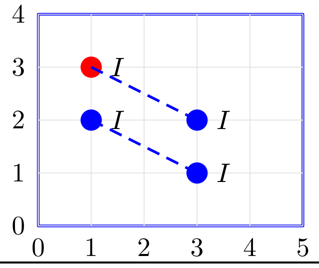
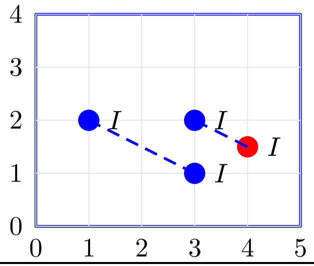
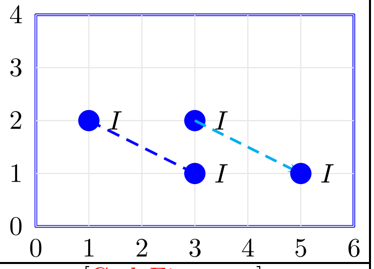
33.3.3 Rotation

		
\pstRotation[linecolor=red] {A}{B}	**\pstRotation**[RotAngle=45] {A}{C}[D]	**\pstRotation**[RotAngle=45] {A}{B,C}[D,E]
	Par défaut : RotAngle=60	

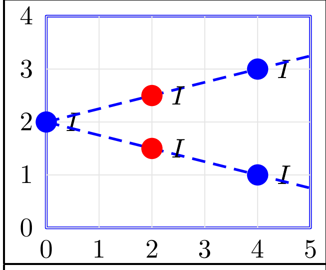
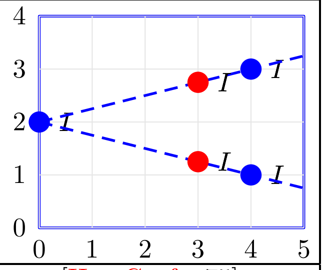
\pstRotation[CodeFig=true,CodeFigColor=red,TransformLabel=\alpha]{A}{B}	
	
TransformLabel=\alpha	TransformLabel=\frac{\pi}{3}

\pstRotation[CodeFig=true,RotAngle=pstAngleAOB{C}{A}{B}] {A}{B} {D}		
 Rotation = 45.0	 Rotation = 44.99	 Rotation = 110.6

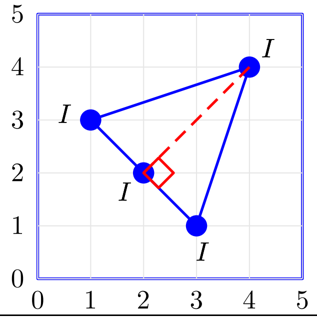
33.3.4 Translation

\pstTranslation[options]{B}{A}{C}	**\pstTranslation**[options]{A}{B}{C}	
		
	[DistCoef=0.5]	[CodeFig=true]

33.3.5 Homothétie

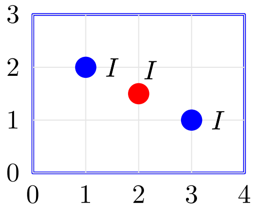
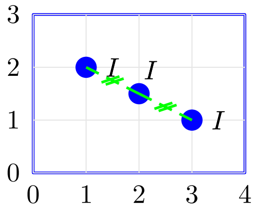
\pstHomO{A}{B,C}[D,E]	
	
	[HomCoef=.75]

33.3.6 Projection orthogonale

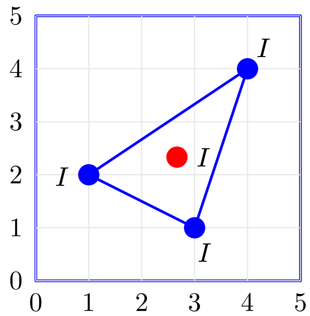

\pstProjection[CodeFig=true,CodeFigColor=red]{A}{B}{C}[D]

33.4 Constructions particulières en géométrie

33.4.1 Point milieu

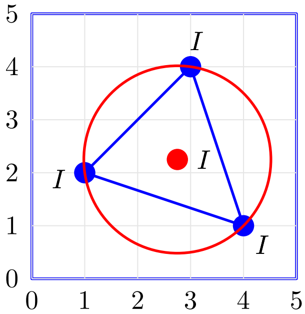
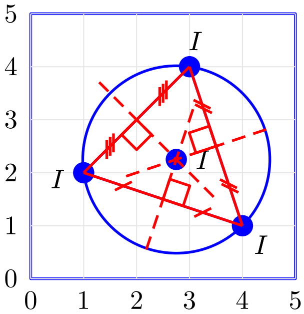
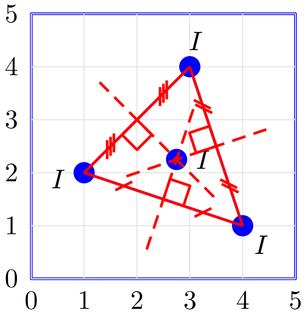
\pstMiddleAB[linecolor=red]{A}{B}{C}	
	
[linecolor=red]	[CodeFig,CodeFigColor=green]

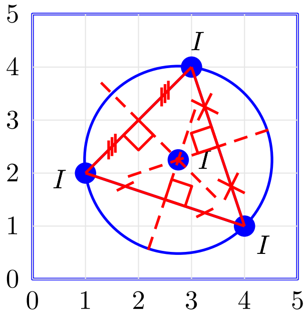
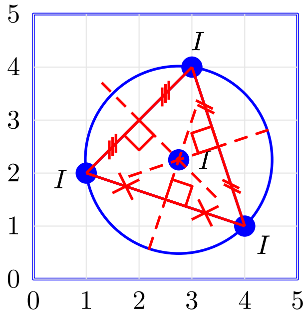
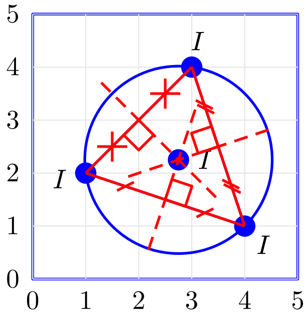
33.4.2 Centre de gravité d'un triangle



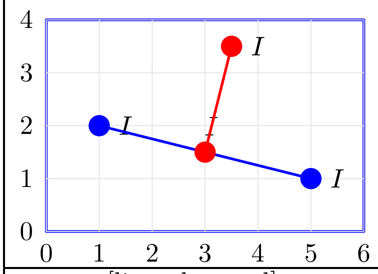
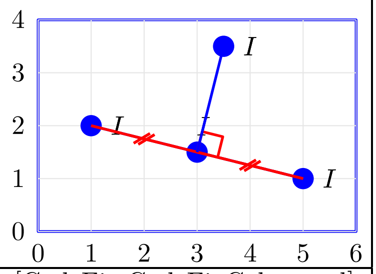
\pstCGravABC[linecolor=red]{A}{B}{C}{G}

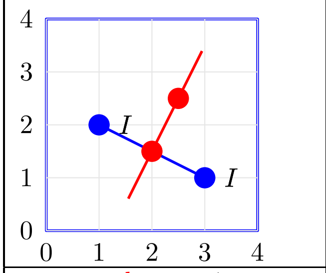
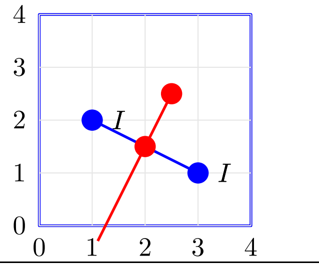
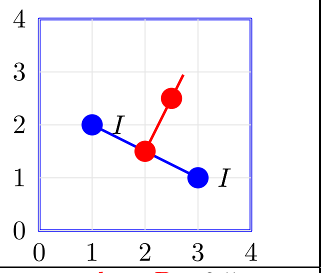
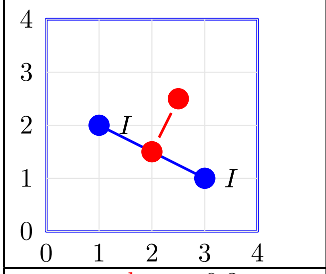
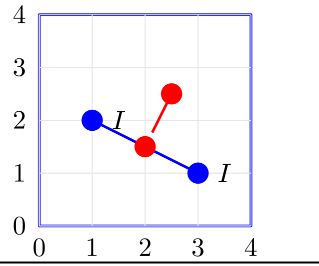
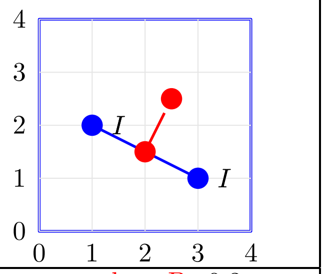
33.4.3 Centre du cercle circonscrit d'un triangle

\pstCircleABC{A}{B}{C}{O}		
		
[linecolor=red]	[CodeFig,CodeFigColor=green]	[CodeFig,CodeFigColor=green ,DrawCirABC=false

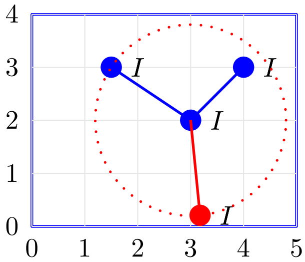
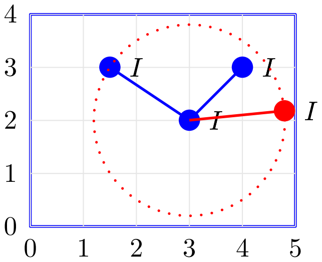
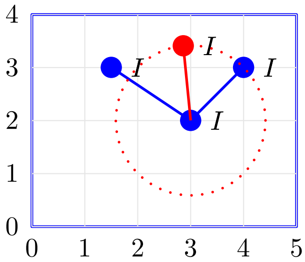
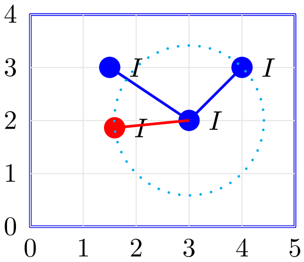
\pstCircleABC[CodeFig,CodeFigColor=red,SegmentSymbolA=MarkCros]{A}{B}{C}{O}		
		
SegmentSymbolA=MarkCros	SegmentSymbolB=MarkCros	SegmentSymbolC=MarkCros

33.4.4 Perpendiculaire par rapport à une droite

pstMediatorAB{A}{B}{C}{D}	
	
[linecolor=red]	[CodeFig,CodeFigColor=red]

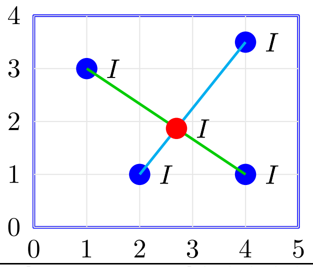
\pstMediatorAB[linecolor=red,PointName=none,nodesep=-1]{A}{B}{C}{D}		
		
nodesep=-1	nodesepA=-2	nodesepB=-0.5
		
nodesep=0.3	nodesepA=0.3	nodesepB=0.3

33.4.5 Bissectrice d'un angle

	
\pstBissectBAC{A}{B}{C}{D}	**\pstOutBissectBAC**{A}{B}{C}{D}
	
\pstBissectBAC{A}{B}{C}{D}	\pstOutBissectBAC{C}{B}{A}{D}

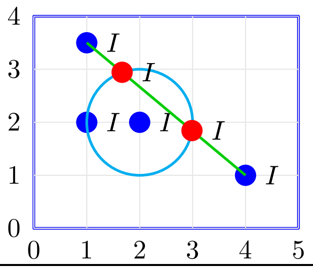
33.5 Intersections [6]

33.5.1 Intersection de deux droites

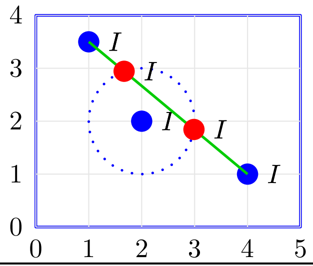


\pstInterLL[linecolor=red]{A}{B}{C}{D}{E}

33.5.2 Intersection d'une droite et un cercle

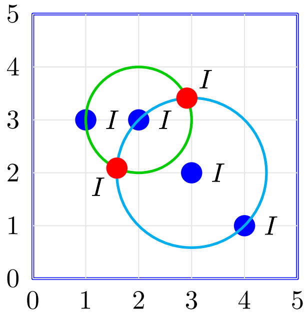


\pstInterLC{A}{B}{C}{D}{E}{F}

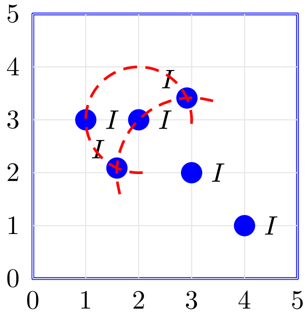


\pstInterLC[Radius=\pstDistVal{1}]{A}{B}{C}{}{E}{F}

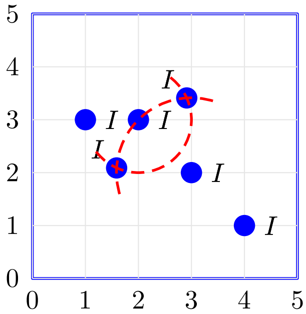
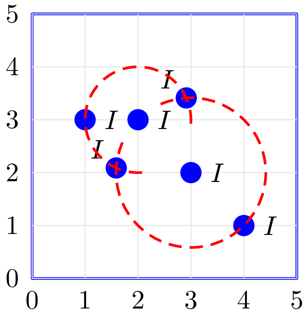
33.5.3 Intersection de deux cercles



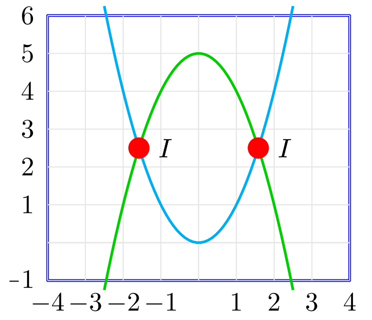
\pstInterCC[linecolor=red,PosAngleA=45,PosAngleB=225]
{A}{B}{C}{D}{E}{F}



CodeFig=true

	
CodeFig=true CodeFigAarc=false	CodeFig=true CodeFigBarc=false
Par défaut : CodeFigAarc =true	Par défaut : CodeFigBarc =true

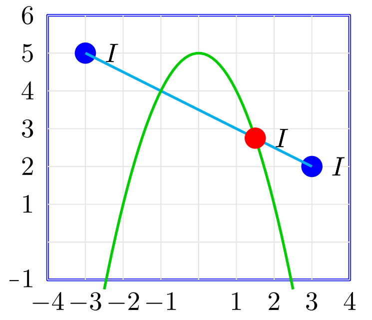
33.5.4 Intersection de deux courbes



```
\def \F{x 2 exp neg 5 add}
\def \G{x 2 exp}
\pstInterFF{\F}{\G}{1}{A}
\pstInterFF{\F}{\G}{-1}{B}
```

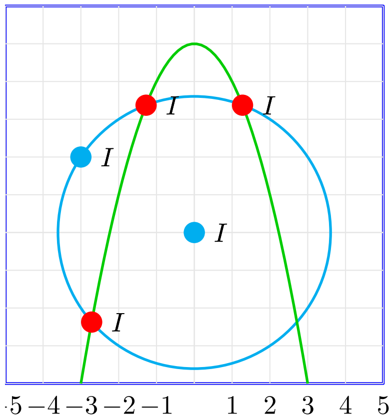
point d'intersection le plus proche de

33.5.5 Intersection d'une droite et d'une courbe



```
\pstLineAB{A}{B}
\def \F{x 2 exp neg 5 add}
\pstInterFL{\F}{A}{B}{1}{C}
```

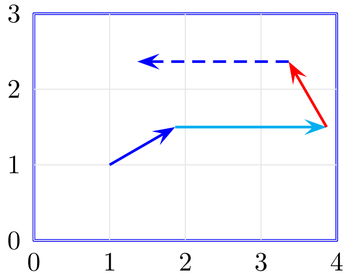
33.5.6 Intersection d'un cercle et d'une courbe



```
\def \F{x 2 exp neg 5 add } : fonction 5 − x^2
\pstCircleOA{A}{B}
\pstInterFC{\F}{A}{B}{-1}{C}
\pstInterFC{\F}{A}{B}{1}{D}
\pstInterFC{\F}{A}{B}{3}{E}
\pstInterFC{\F}{A}{B}{1}{D}
\pstInterFC{\F}{A}{B}{3}{E}
```

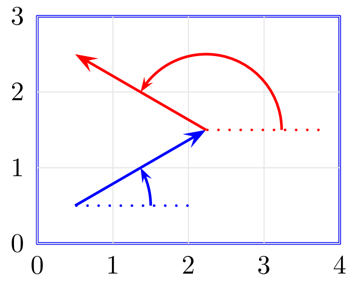
34 Les vecteurs

34.1 Chaine de vecteurs

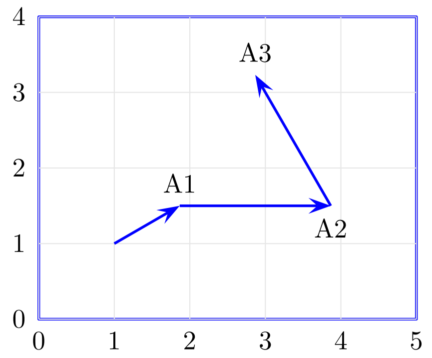


```
\psStartPoint(1,1)
\psVector[linecolor=blue](1;30)
\psVector[linecolor=cyan](2;0)
\psVector[linecolor=red](1;120)
\psVector[linestyle=dashed](2;180)
```

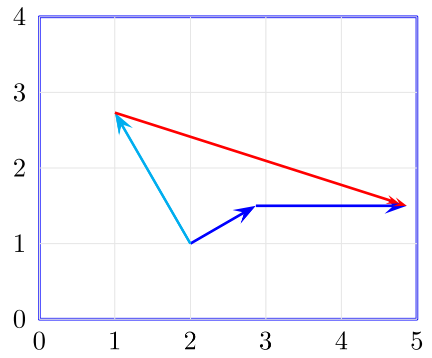
34.2 Options



```
\psStartPoint(.5,.5)
\psVector[linecolor=blue,markAngle](2;30)
\psVector[linecolor=red,markAngle](2;150)
```



```
\psStartPoint[A](1,1)
\uput[90](A1){A1}
\uput[-90](A2){A2}
```

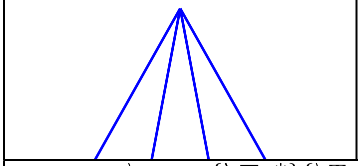
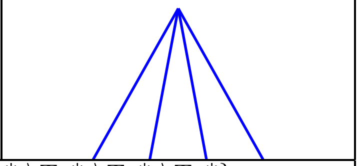
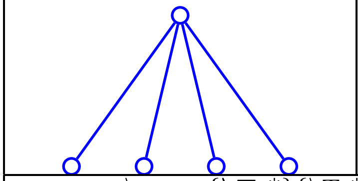
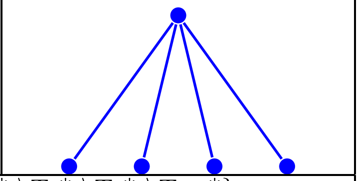
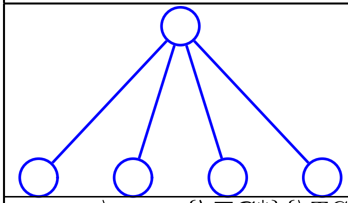
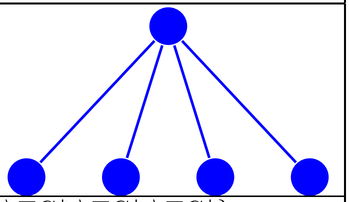
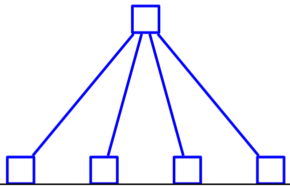
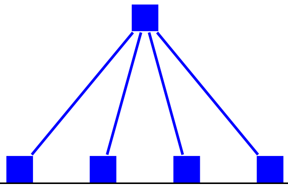
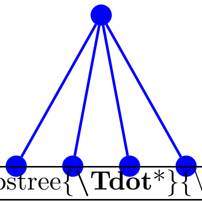
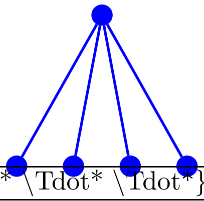


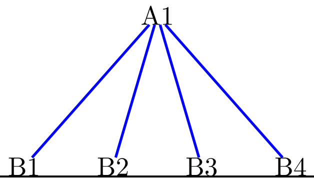
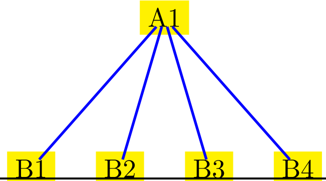
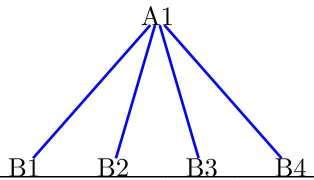
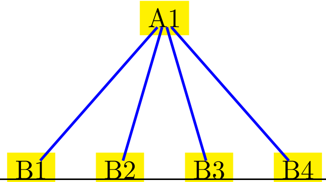
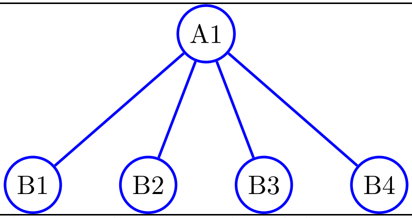
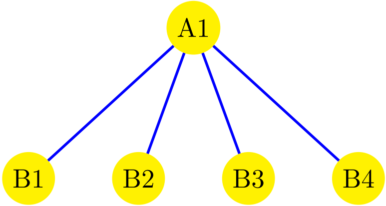
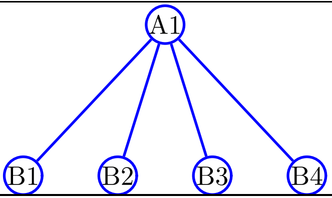
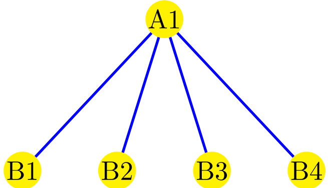
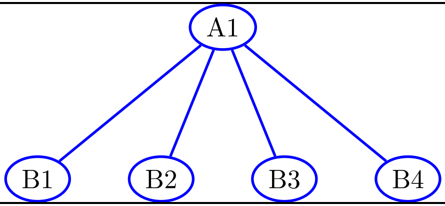
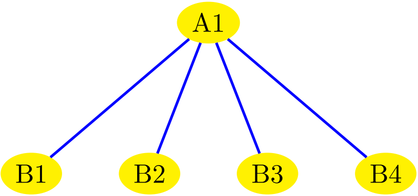
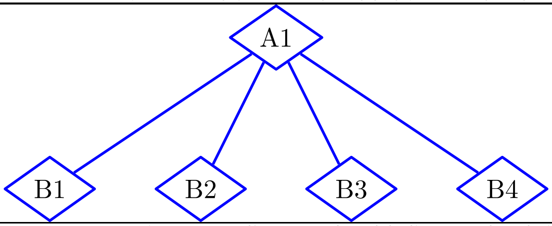
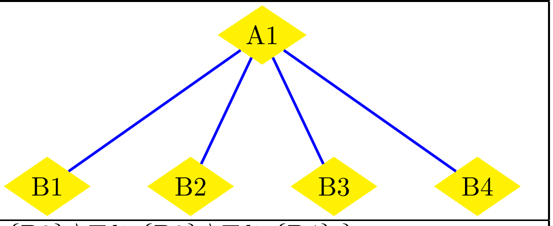
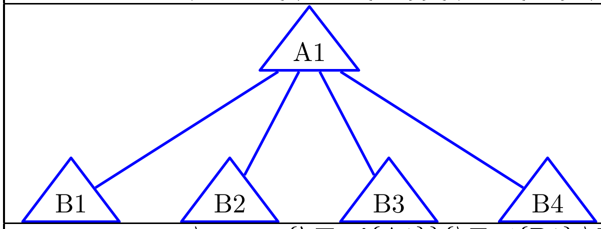
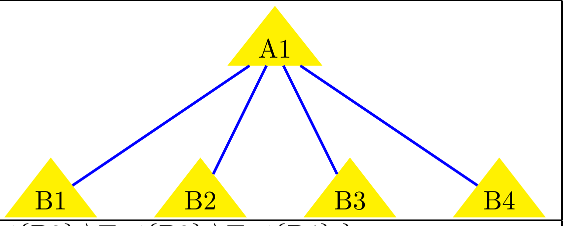
```
\psStartPoint[A](2,1)
\psStartPoint[B](2,1)
\psline[linecolor=red]{-»}(B1)(A2)
```

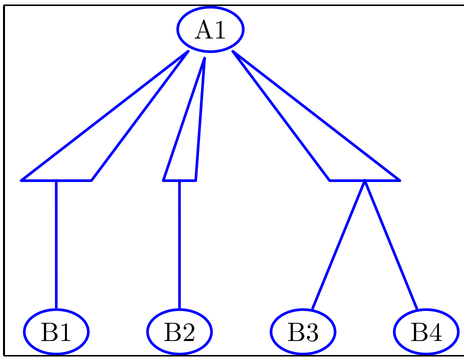
35 Les diagrammes arborescents

35.1 structure

35.2 les noeuds

sans astérisque	**avec astérisque**
	
\pstree{**\Tp***}{\Tp* \Tp* \Tp* \Tp*}	
	
\pstree{**\Tc***}{\Tc* \Tc* \Tc* \Tc=*}	
	
\pstree{**\TC***}{\TC* \TC* \TC* \TC*}	
	
\pstree{**\Tf***}{\Tf* \Tf* \Tf* \Tf*}	
	
\pstree{**\Tdot***}{\Tdot* \Tdot* \Tdot* \Tdot*}	

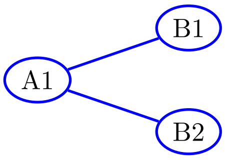
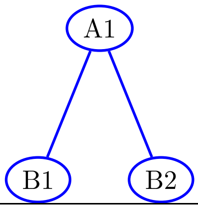
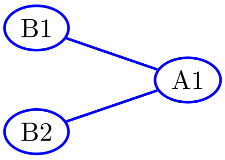
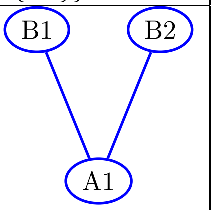
sans astérisque	**avec astérisque**
	
\pstree{**Tr**{A1}}{\Tr{B1} \Tr{B2} \Tr{B3} \Tr{B4}}	
	
\pstree{**TR**{A1}}{\TR{B1} \TR{B2} \TR{B3} \TR{B4}}	
	
\pstree {**Tcircle**{A1}}{\Tcircle{B1} \Tcircle{B2} \Tcircle{B3} \Tcircle{B4} }	
	
\pstree {**TCircle**{A1}}{\TCircle{B1} \TCircle{B2} \TCircle{B3} \TCircle{B4} }	
	
\pstree {**Toval**{A1}}{\Toval{B1} \Toval{B2} \Toval{B3} \Toval{B4} }	
	
\pstree {**Tdia**{A1}}{\Tdia{B1} \Tdia{B2} \Tdia{B3} \Tdia{B4} }	
	
\pstree {**Ttri**{A1}}{\Ttri{B1} \Ttri{B2} \Ttri{B3} \Ttri{B4} }	

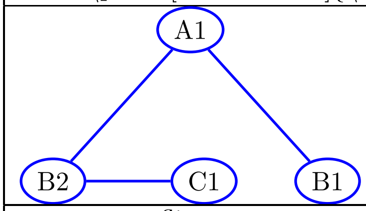
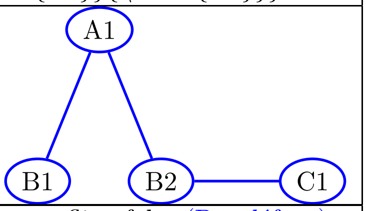


```
\pstree{\Toval{A1}}{%
\pstree{\Tfan}{\Toval{B1}}
\pstree{\Tfan[fansize=.5]}{\Toval{B2}}
\pstree{\Tfan}{\Toval{B3} \Toval{B4} }
}
```

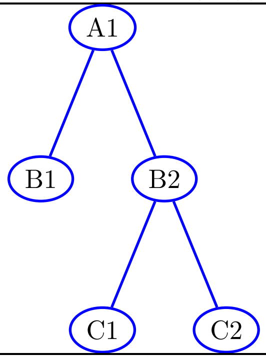
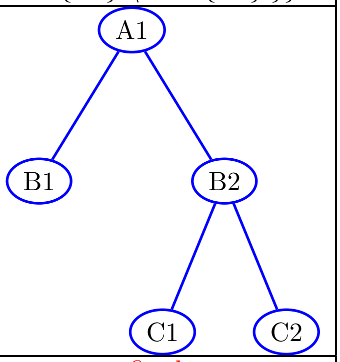
Par défaut : fansize= 1cm

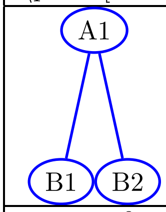
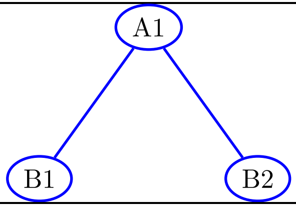
35.3 Orientation

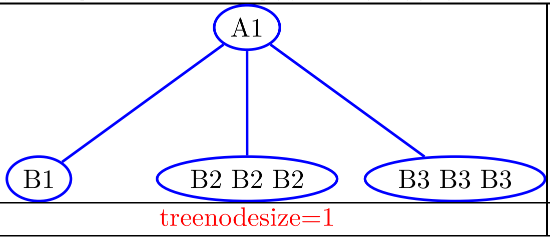
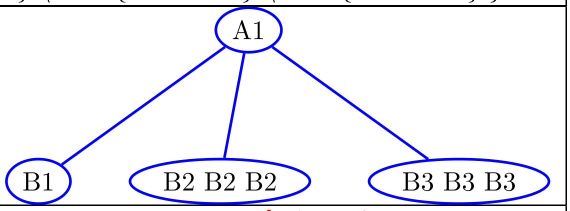
`\pstree[treemode=R]{\Toval{A1}}{\Toval{B1} \Toval{B2}}`			
			
treemode=R	treemode=D	treemode=L	treemode=U

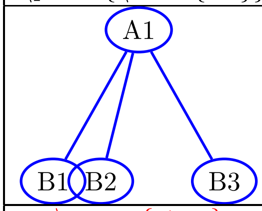
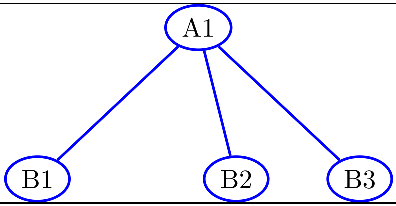
`\pstree[treeflip=true]{ \Toval{A1}} {\Toval{B1}` `\pstree[treemode=R]{\Toval{B2}}{\Toval{C1}}}`	
	
treeflip=true	treeflip=false (Par défaut)

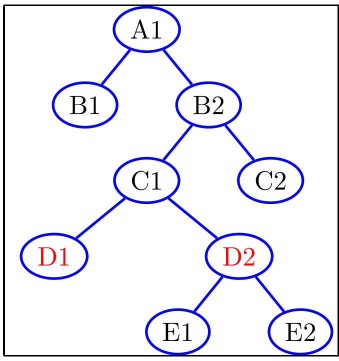
35.4 Distance entre 2 noeuds de même niveau

<table>
<tr><td colspan="2">\pstree[treefit=tight] { \Toval{A1}} { \Toval{B1}
\pstree{ \Toval{B2}} { \Toval{C1} \Toval{C2} }}</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td>treefit=tight (Par défaut)</td><td>treefit=loose</td></tr>
</table>

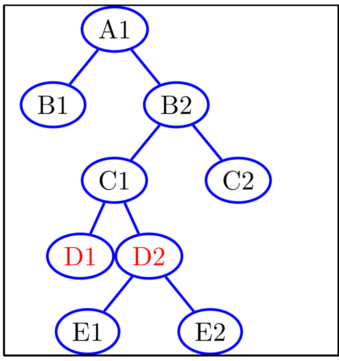
<table>
<tr><td colspan="2">\pstree[treesep=0cm]{\Toval{A1}}{\Toval{B1} \Toval{B2}}</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td>treesep=0cm</td><td>treesep=2cm (Par défaut : treesep=0.75cm)</td></tr>
</table>

<table>
<tr><td colspan="2">\pstree[treenodesize=1]{\Toval{A1}} {\Toval{B1} \Toval{B2 B2 B2} \Toval{B3 B3 B3} }</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td>treenodesize=1</td><td>treenodesize=-1</td></tr>
</table>

<table>
<tr><td colspan="2">\pstree{\Toval{A1}} {\Toval{B1} \tspace{-1cm} \Toval{B2} \Toval{B3} }</td></tr>
<tr><td> </td><td> </td></tr>
<tr><td>\tspace{-1cm}</td><td>\tspace{1cm}</td></tr>
</table>

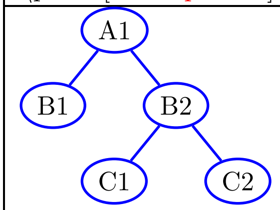
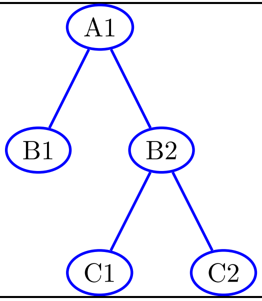
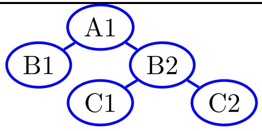
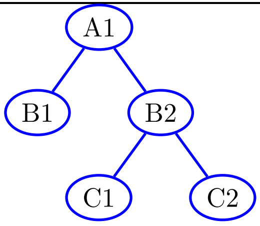


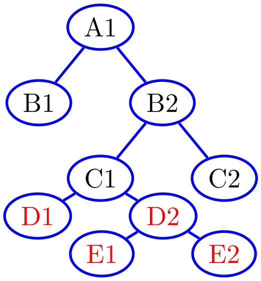
```
\pstree[levelsep=1cm]{\Toval{A1}}
{\Toval{B1}
\pstree{\Toval{B2}}{
\pstree[thistreefit=loose]{\Toval{C1}}
{\Toval{D1}
\pstree{\Toval{D2}}
{\Toval{E1}
\Toval{E2}}}
\Toval{C2}}}
```



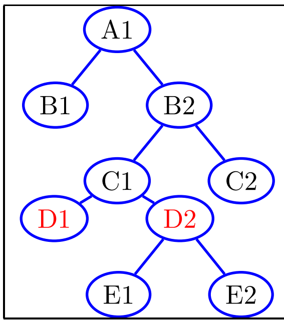
```
\pstree[levelsep=1cm]{\Toval{A1}}
{\Toval{B1}
\pstree{\Toval{B2}}{
\pstree[thistreesep=0]{\Toval{C1}}
{\Toval{D1}
\pstree{\Toval{D2}}
{\Toval{E1}
\Toval{E2}}}
\Toval{C2}}}
```

35.5 Distance entre noeuds successifs

\pstree[levelsep=1cm] {\Toval{A1}} { \Toval{B1} \pstree{\Toval{B2}} {\Toval{C1} \Toval{C2}} }			
			
levelsep=1cm	levelsep=*1cm	levelsep=.5cm	levelsep=*.5cm
(Par défaut : 2cm)			

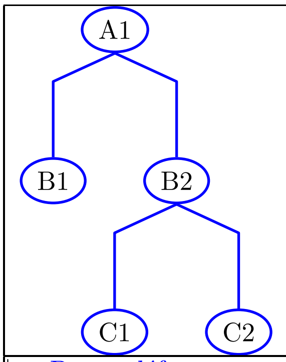


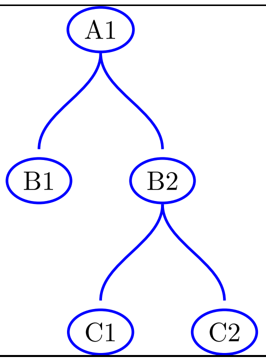
```
\pstree[levelsep=1cm]{\Toval{A1}}
{\Toval{B1}
\pstree{\Toval{B2}}{
\pstree[ levelsep=0.5cm]{\Toval{C1}}
{\Toval{D1}
\pstree{\Toval{D2}}
{\Toval{E1}
\Toval{E2}}}
\Toval{C2}}}
```



```
\pstree[levelsep=1cm]{\Toval{A1}}
{\Toval{B1}
\pstree{\Toval{B2}}{
\pstree[thislevelsep=0.5cm]{\Toval{C1}}
{\Toval{D1}
\pstree{\Toval{D2}}
{\Toval{E1}
\Toval{E2}}}
\Toval{C2}}}
```

35.6 Liaison des noeuds



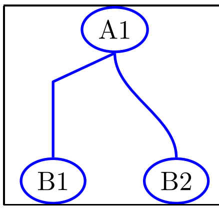


Redéfinition du type de liaison 2 possibilités :

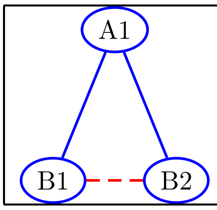
\renewcommand{**\psedge**}{\ncdiag[angle=-90,armA=0,angleB=90,armB=1cm]}

\def\psedge{\nccurve[angleA=-90 ,angleB=90,nodesepB=3pt]}

| Par défaut : \ncline Autres possibilités voir page 40



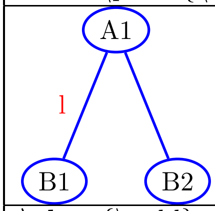
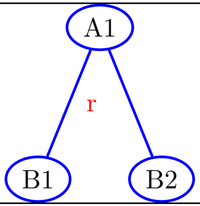
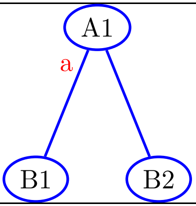
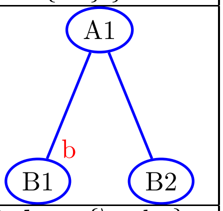
```
\pstree{\Toval{A1}}
{\Toval[edge={\ncdiag[angleA=-90,angleB=90,armA=0,armB=1cm]}]{B1}
\Toval[edge={\nccurve[angleA=-90,angleB=90]}]{B2}}
```

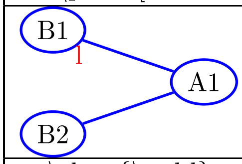
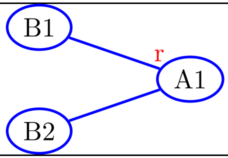
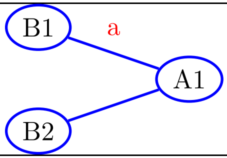
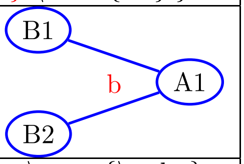


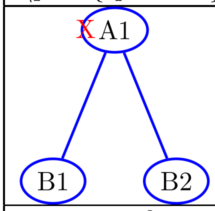
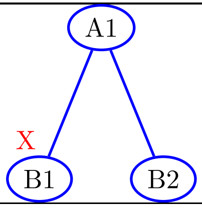
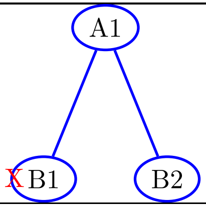
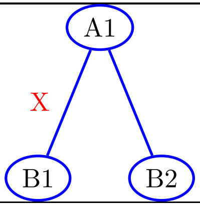
```
\pstree{\Toval{A1}}
{\Toval[name=A]{B1}\Toval[name=B]{B2}}
\ncline[linestyle=dashed,linecolor=red]{A}{B}
```

35.7 Etiquettes

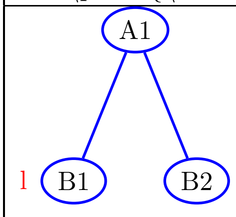
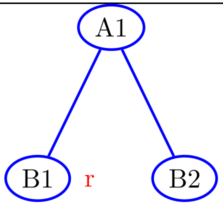
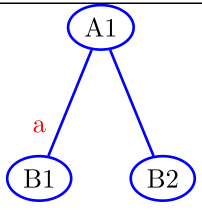
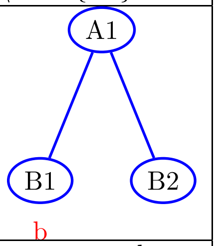
35.7.1 Etiquettes sur les liaisons

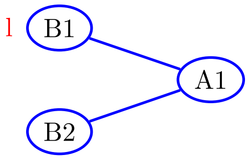
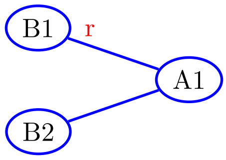
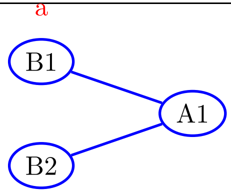
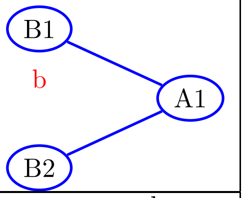
`\pstree{\Toval{A1}} {\Toval{B1} \tlput{\red l} \Toval{B2} }`			
			
`\tlput``{\red l}`	**`\trput`**`{\red r}`	**`\taput`**`{\red a}`	**`\tbput`**`{\red a}`

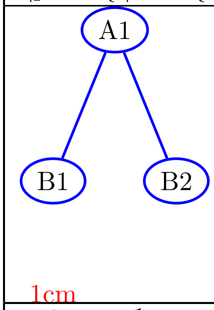
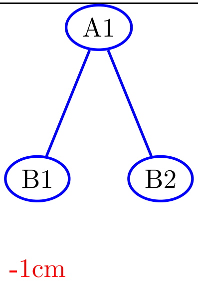
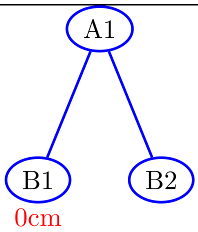
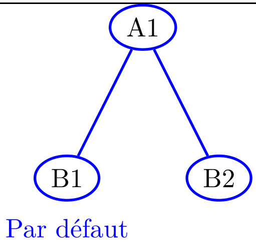
`\pstree[treemode=L]{\Toval{A1}} {\Toval{B1} \tlput{\red l} \Toval{B2} }`			
			
`\tlput{\red l}`	`\trput{\red r}`	`\taput{\red a}`	`\taput{\red a}`

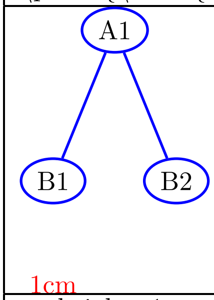
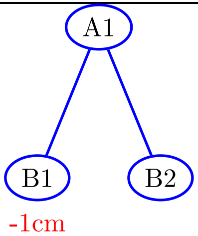
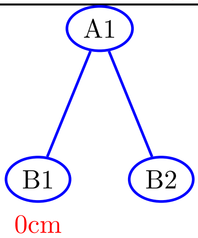
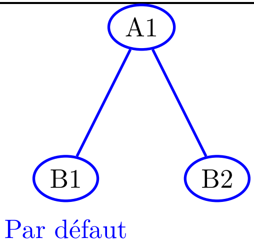
`\psset{tpos=.75} \pstree{\Toval{A1}} {\Toval{B1} \tlput{\red X} \Toval{B2} }`			
			
tpos=0	tpos=.75	tpos=1	Par défaut

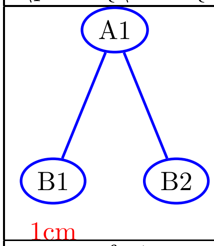
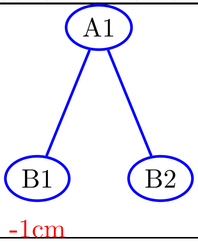
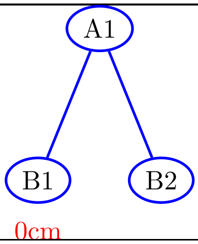
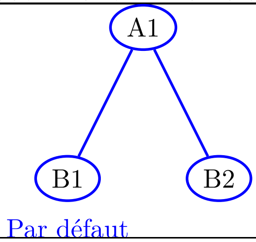
35.7.2 Etiquettes sur les noeuds

`\pstree{\Toval{A1}} {\Toval{B1} ~[tnpos=l]{\red l}} \Toval{B2}`			
			
tnpos=l	tnpos=r	tnpos=a	tnpos=b

`\pstree[treemode=L]{\Toval{A1}} {\Toval{B1} ~[tnpos=l]{\red l} \Toval{B2} }`			
			
tnpos=l	tnpos=r	tnpos=a	tnpos=b

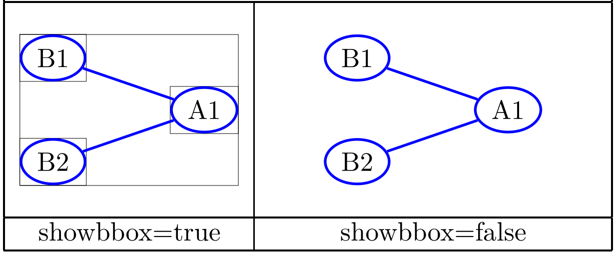
\pstree{\Toval{A1}} {\Toval{B1} ~[tnpos=b,tnsep=1cm]{\red 1cm} \Toval{B2} }			
			
tnsep=1cm	tnsep=-1cm	tnsep=0cm	Par défaut

\pstree{\Toval{A1}} {\Toval{B1} ~[tnpos=b,tnheight=1cm]{\red l} \Toval{B2} }			
			
tnheight=1cm	tnheight=-1cm	tnheight=0cm	Par défaut

\pstree{\Toval{A1}} {\Toval{B1} ~[tnpos=b,tnyref=1cm]{\red l} \Toval{B2} }			
			
tnyref=1cm	tnyref=-1cm	tnyref=0cm	Par défaut

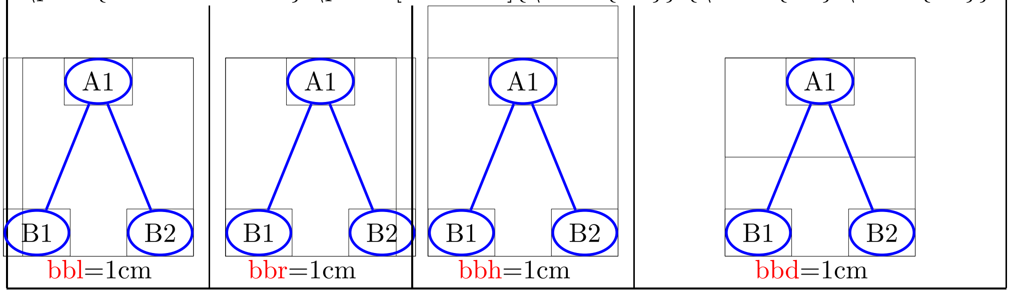
35.8 Showbbox

```
\psset{showbbox=true}
\pstree{\Toval{A1}} {\Toval{B1} \Toval{B2}}
```



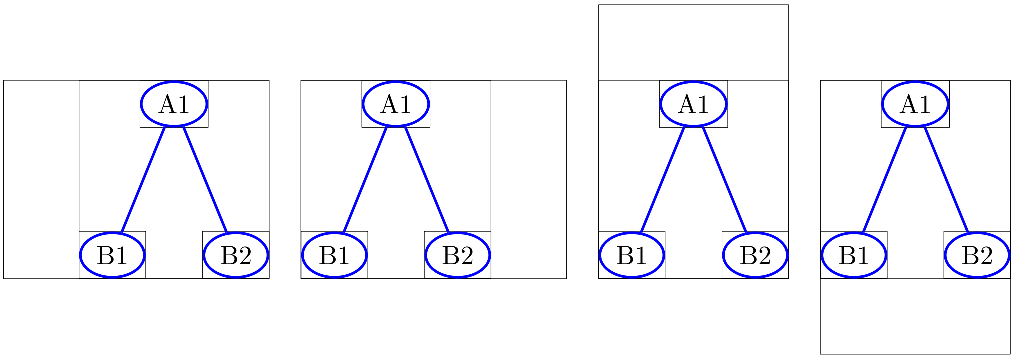
showbbox=true | showbbox=false

```
\psset{showbbox=true} \pstree[bbl=1cm]{\Toval{A1}} {\Toval{B1} \Toval{B2}}
```

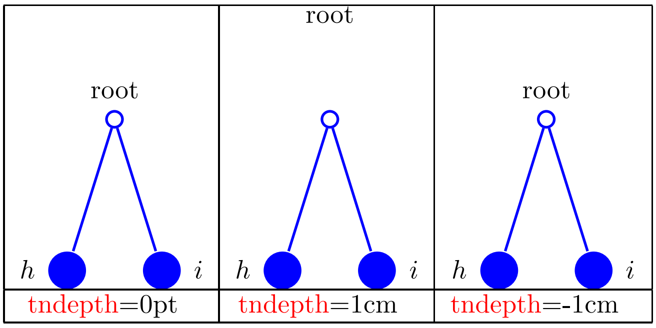


bbl=1cm bbr=1cm bbh=1cm bbd=1cm

```
\psset{showbbox=true} \pstree[xbbl=1cm]{\Toval{A1}} {\Toval{B1} \Toval{B2}}
```

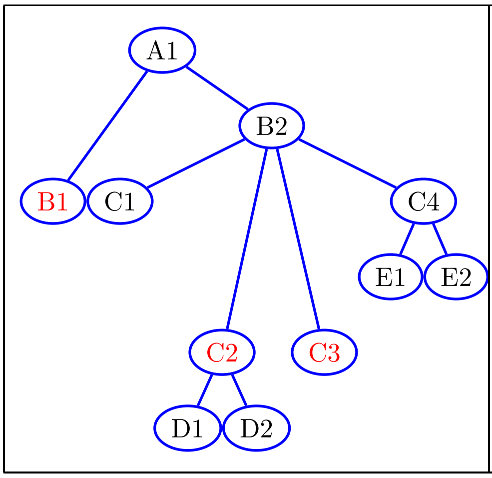


xbbl=1cm xbbr=1cm xbbh=1cm xbbd=1cm



tndepth=0pt tndepth=1cm tndepth=-1cm

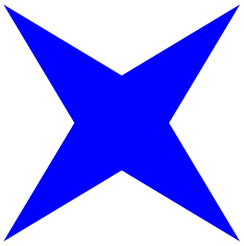
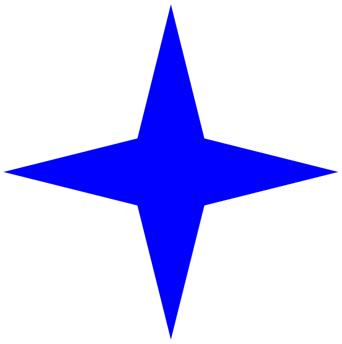
35.9 skiplevel

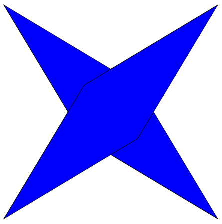


```
\pstree[levelsep=1cm,treesep=0cm]{\Toval{A1}}{%

\skiplevel {\Toval{\red B1} }

\pstree{\Toval{B2}}{%
\Toval{C1}

\skiplevels{2}
\pstree{\Toval{\red C2}}{\Toval{D1}
\Toval{D2}}
\Toval{\red C3}
\endskiplevels

\pstree{\Toval{C4}}{\Toval{E1} \Toval{E2}}}}
```

36 Les animations

36.1 Animation à partir de fichiers d'image

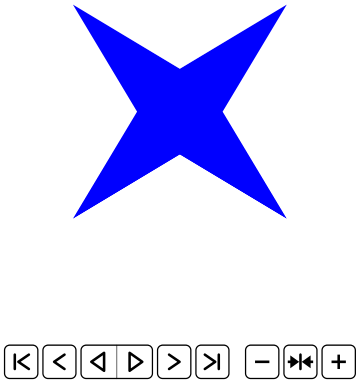
première image	second et dernière image
	
\includegraphics{XXX1.ps}	\includegraphics{XXX2.ps}



animategraphics :	
[controls,	:boutons de contrôle
loop	:en boucle
autoplay]	:auto demarrage
{4}	:4 fois par seconde
{XXX}	:base du nom fichier
{1}	:numero de debut
{2}	:numeo de fin

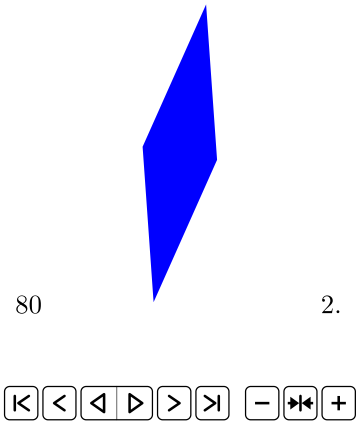
|< < ◁ ▷ > >| − ▸◂ +

36.2 Animateinline



```
\begin{animateinline}[controls,loop,autoplay]{5}

% première image
\begin{pspicture}(6,6)
\psdiamond*[gangle=45](3,3)(2,.5)
\psdiamond*[gangle=135](3,3)(2,.5)
\end{pspicture}

% deuxième
\newframe
\begin{pspicture}(6,6)
\psdiamond*[gangle=0](3,3)(2,.5)
\psdiamond*[gangle=90](3,3)(2,.5)
\end{pspicture}

\end{animateinline}
```

36.3 Multiframe

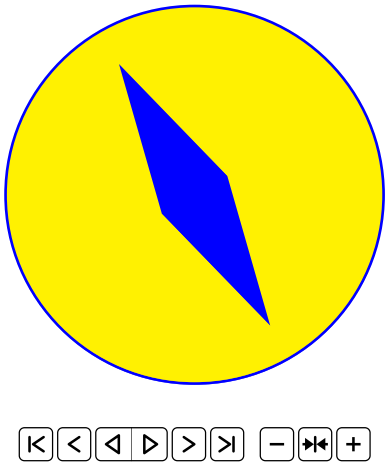


```
\begin{animateinline}[poster=first,controls,
palindrome]{12}
\multiframe{29}{iAngle=80+10,
Rdim=2.0+-0.2}{
\begin{pspicture}(6,6)
\psdiamond*[gangle=\iAngle](3,3)(\Rdim,.5)
\rput(1,1){\iAngle}
\rput(5,1){\Rdim}
\end{pspicture} }
\end{animateinline}
```

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

36.4 Timeline



```
\begin{animateinline}
[controls,autoplay,timeline=xxx.txt]{5}

% 1 image de fondfirst background image (image N° 0)
\begin{pspicture}(6,6)
\pscircle[fillcolor=yellow,fillstyle=solid](3,3){2.5}
\end{pspicture}

\newframe % 2 page de fond (image N° 1)
\begin{pspicture}(6,6)
\pscircle[linecolor=red,fillcolor=green,fillstyle=solid](3,3){2.5}
\end{pspicture}

\newframe % animation (images N° 2 - 11)
\multiframe{10}{iAngle=60+10}{
\begin{pspicture}(6,6)
\psdiamond*[gangle=\iAngle](3,3)(2,.5)
\end{pspicture} }
\end{animateinline}
```

36.4.1 Création du fichier pour timeline

Pour créer le fichier xxx.txt , en insérant le code suivant avant \begin{document}

```
\begin{filecontents}{xxx.txt}
: :0x0,8
: :2
: :7
: :3
: :6
: :c,1x3,5
: :4
: :11
: :5
: :7
: :9
\end{filecontents}
```

0x0 : image N° 0 sert de fond tout le temps

c : efface les images précédentes

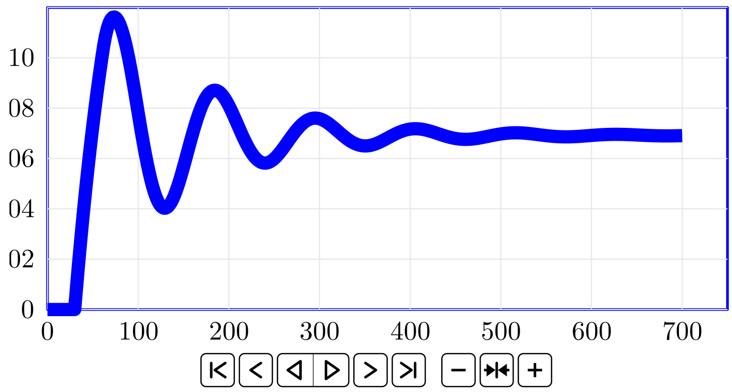
1x3 : image N° 1 sert de fond 3 fois

Ordre de passage des images : 8,2,7,3,6,5,4,11,5,7,9

36.4.2 option pour le fichier xxx.txt

* : : 3	pause à l'image N° 3
: 10 : 3	vitesse 10 par seconde à l'image N° 3
: : 3 : code	code java possible à l'image N° 3

36.5 Animation d'un graphe

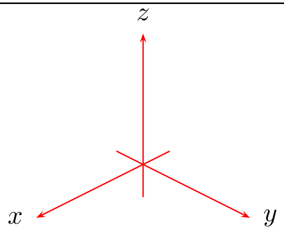


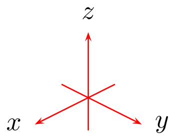
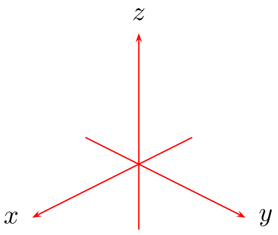
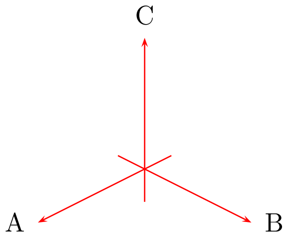
```
    \readdata{\dat}{mesdata.dat}
\begin{animateinline}[poster=last,controls]{5}
\multiframe{70}{ifin=10+10}{
\begin{psgraph}[axesstyle=frame,xticksize=0 4cm,yticksize=0 9cm,subticks=0,Dx=100,Dy=.02](0,0)(750,.12){9cm}{
\listplot[xEnd=\ifin,linecolor=blue,linewidth=5pt]{\dat}
\end{psgraph} }
\end{animateinline}
```

37 Créer un dessin en 3D

Utilisation du module **pst-3dplot**

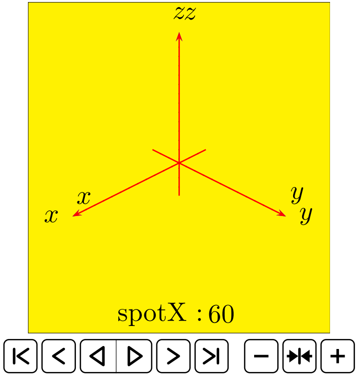
37.1 Les axes en 3 D

\pstThreeDCoor	
	
drawing=true (Par défaut)	drawing=false

\pstThreeDCoor[xMax=2,yMax=2,zMax=2]		
		
xMax=2,yMax=2,zMax=2	xMin=-2,yMin=-2,zMin=-2	nameX=A,nameY=B,nameZ=C
Par défaut : xMax=yMax=zMax=4	Par défaut : xMin=yMin=zMin=-1	

37.1.1 Option spotX

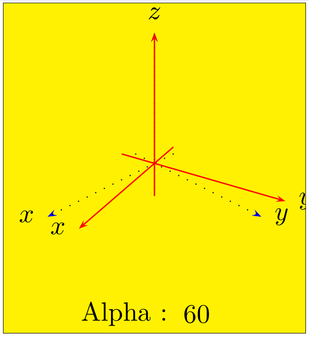
```
\pstThreeDCoor[spotX=60,spotY=60,spotZ=60]
```



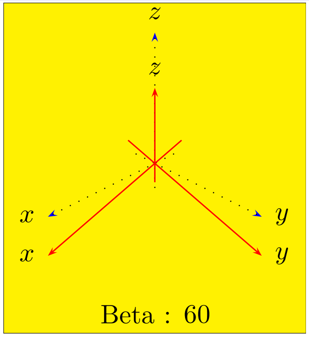
37.1.2 Orientation des axes

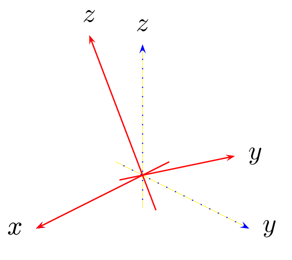
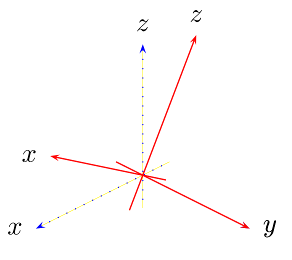
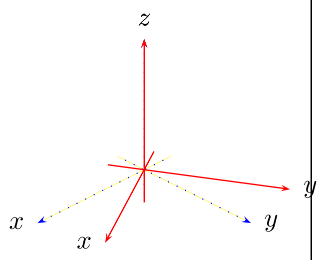
\pstThreeDCoor[linecolor=blue,linestyle=dotted]

\pstThreeDCoor[Alpha=30]



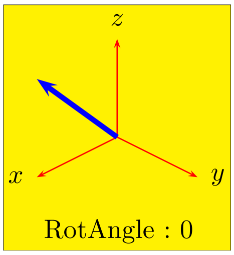
\pstThreeDCoor[Beta=30]



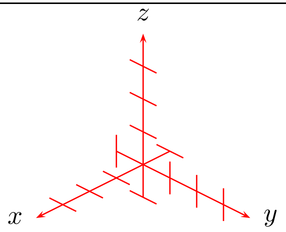
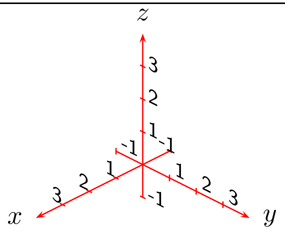
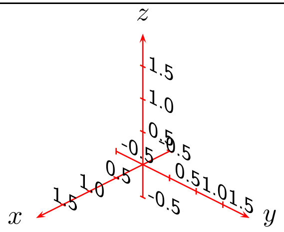
\pstThreeDCoor[linestyle=dotted,linecolor=blue] \pstThreeDCoor[RotX=30]		
 	 	
RotX=30	RotY=-30	RotZ=30
Par défaut : RotX=0	Par défaut : RotY=0	Par défaut : RotZ=0

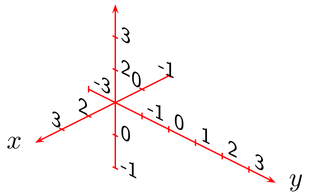
\pstThreeDCoor[RotSequence=quaternion,RotAngle=10,
xRotVec=3,yRotVec=0,zRotVec=3,
xMin=0,xMax=3, yMin=0,yMax=3, zMin=0,zMax=3]

\pstThreeDLine[linecolor=blue, linewidth=2pt, arrows=->](0,0,0)(3,0,3)

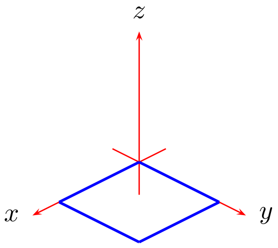
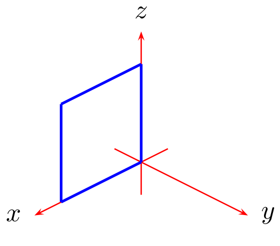
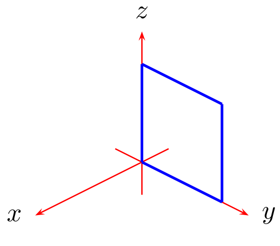


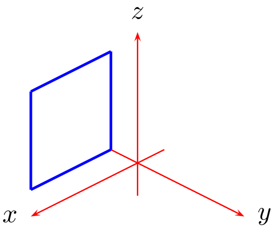
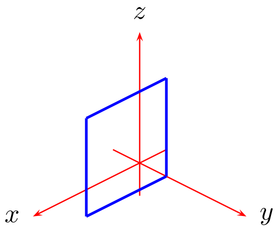
37.1.3 Option Ticks

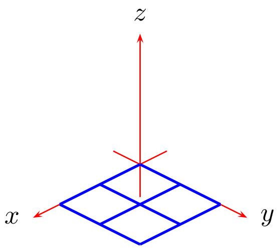
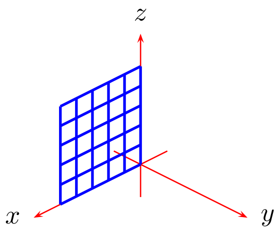
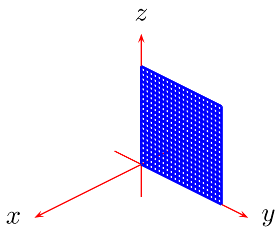
\pstThreeDCoor[IIIDticks,IIIDticksize=.5pt]		
		
IIIDticks,IIIDticksize= .5pt	IIIDticks,IIIDlabels	Dx=.5,Dy=.5,Dz=.5
Par défaut : IIIDticksize=0.1	Par défaut : IIIDlabels=false	Par défaut : Dx=Dy=Dz=1

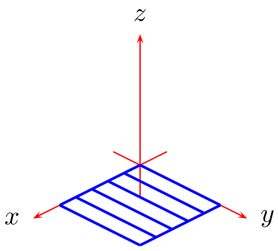
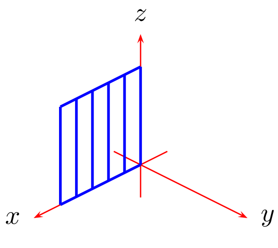
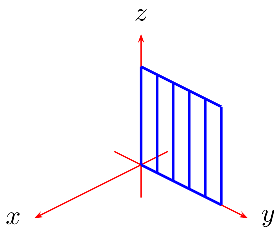
\pstThreeDCoor[IIIDticks,IIIDlabels, yMin=-3,IIIDOffset={(1,-2,1)}]


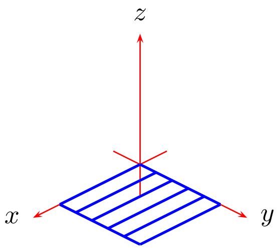
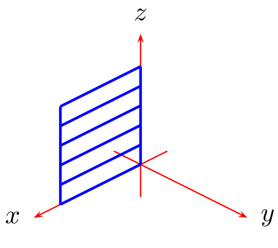
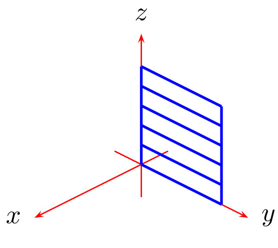
37.1.4 Option pstThreeDPlaneGrid

\pstThreeDPlaneGrid[planeGrid=xz](0,0)(3,3)		
		
Par défaut(planeGrid=xy)	planeGrid=xz	planeGrid=yz

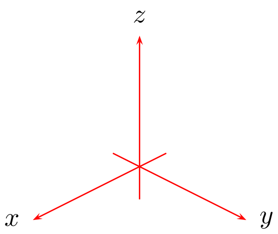
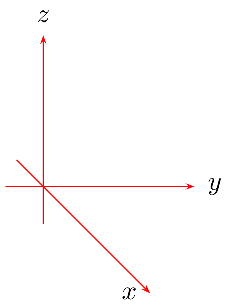
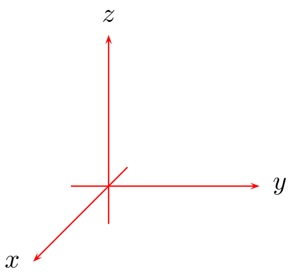
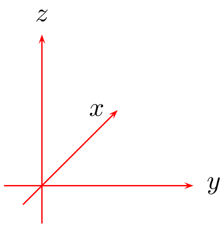
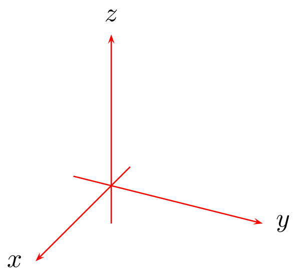
BSpstThreeDPlaneGrid[planeGrid=xz, planeGridOffset=-1](0,0)(3,3)	
	
planeGridOffset=-1	planeGridOffset=1

<table>
<tr><td colspan="3">\pstThreeDPlaneGrid[planeGrid=xy,subticks=2](0,0)(3,3)</td></tr>
<tr>
<td>
</td>
<td>
</td>
<td>
</td>
</tr>
<tr><td>planeGrid=xy
subticks=2</td><td>planeGrid=xz
subticks=5</td><td>planeGrid=yz
subticks=20</td></tr>
</table>

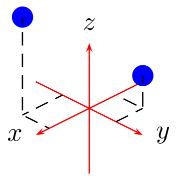
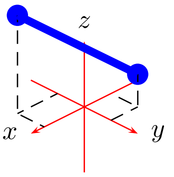
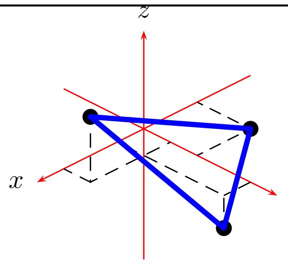
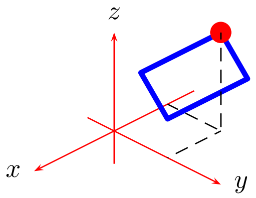
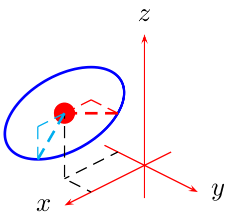
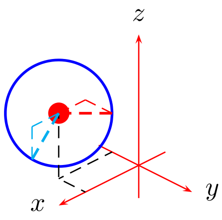
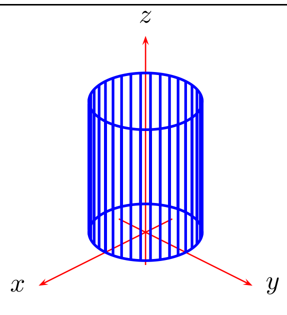
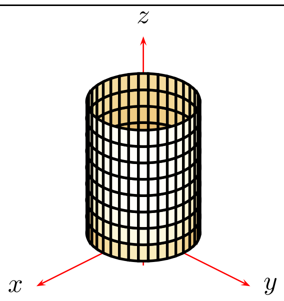
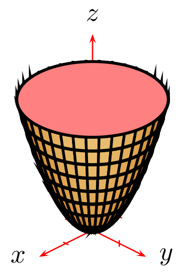
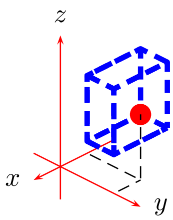
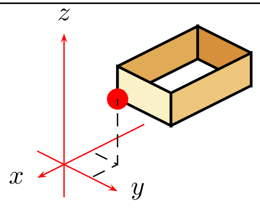
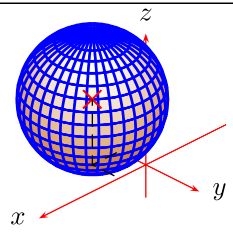
<table>
<tr><td colspan="3">\pstThreeDPlaneGrid[planeGrid=xy,xsubticks=5](0,0)(3,3)</td></tr>
<tr>
<td>
</td>
<td>
</td>
<td>
</td>
</tr>
<tr><td>planeGrid=xy
xsubticks=5</td><td>planeGrid=xz
xsubticks=5</td><td>planeGrid=yz
xsubticks=5</td></tr>
</table>

<table>
<tr><td colspan="3">\pstThreeDPlaneGrid[planeGrid=xy,ysubticks=2](0,0)(3,3)</td></tr>
<tr>
<td>
</td>
<td>
</td>
<td>
</td>
</tr>
<tr><td>planeGrid=xy
ysubticks=5</td><td>planeGrid=xz
ysubticks=5</td><td>planeGrid=yz
ysubticks=5</td></tr>
</table>

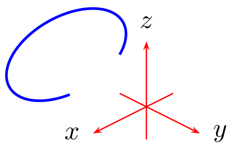
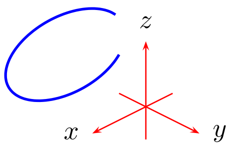
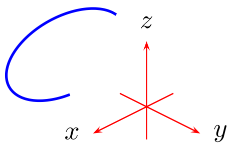
37.1.5 Option coorType

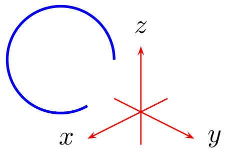
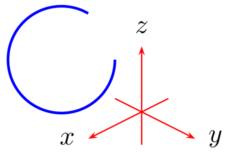
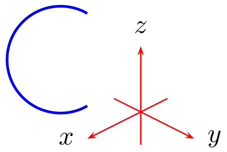
\pstThreeDCoor[coorType=0]		
		
coorType=0	coorType=1	coorType=2
		
coorType=3	coorType=4	

38 Les objets en 3D

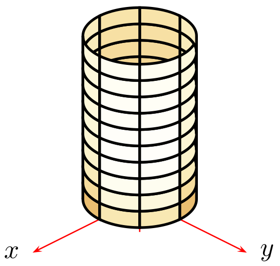
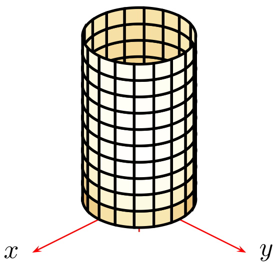
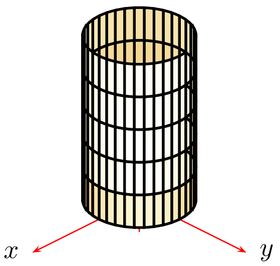
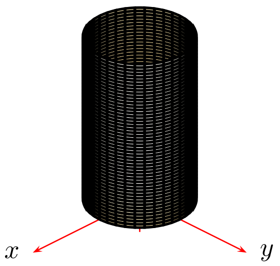
		
\pstThreeDDot(-1,1,1) **\pstThreeDDot**(1.5,-1,3)	**\pstThreeDLine** (-1,1,1)(1.5,-1,-1)	**\pstThreeDTriangle** (3,1,2)(1,4,-1)(-2,2,0)
		
\pstThreeDSquare (-2,2,3) (3,0,0)(0,1,-1) position 2 vecteurs	**\pstThreeDEllipse** (2,-1,2) (-1,1,0)(1,0,-1) centre 2 vecteurs	**\pstThreeDCircle** (1,-1,2) {2} centre 2 vecteurs
		
\pstIIIDCylinder{1.5}{4}	**\psCylinder**{1.5}{4}	**\pstParaboloid**{4}{2}
		
\pstThreeDBox (-1,1,2) (0,0,2)(2,0,0)(0,1,0) position vecteurs en X Y Z	**\psBox** (-1,1,2) {-3}{1}{2} position vecteurs en X Y Z	**\pstThreeDSphere** (1,-1,2) {2} centre rayon

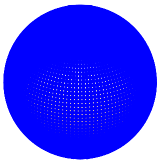
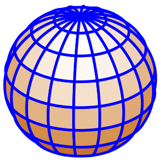
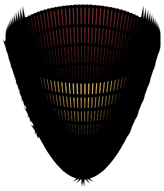
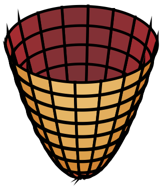
38.0.1 Portion d ellipse ou de cercle

\pstThreeDEllipse[beginAngle=60](2,-1,2)(-1,1,0)(1,0,-1)		
		
beginAngle=60 Par défaut : beginAngle=0	endAngle=300 Par défaut : endAngle=360	beginAngle=60 endAngle=300

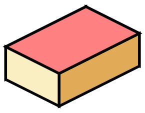
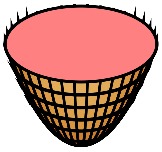
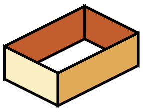
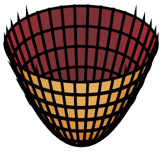
\pstThreeDCircle[endAngle=300](2,-1,2)(-1,1,0)(1,0,-1)		
		
beginAngle=60 Par défaut : beginAngle=0	endAngle=300 Par défaut : endAngle=360	beginAngle=60 endAngle=300

38.0.2 *increment*

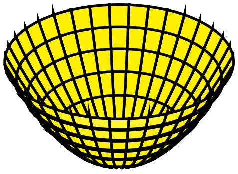
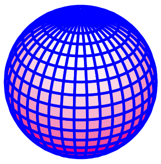
incrément angulaire		incrément vertical	
			
increment=45	increment=20	Hincrement=1	Hincrement=.1
Par défaut : increment=.1		Par défaut : Hincrement=0.5	

\pstThreeDSphere[increment=3](1,-1,2){2}		\pstParaboloid[increment=3](4){2}	
			
increment=3	increment=20	increment=3	increment=20
Par défaut : increment = 10			

38.0.3 showInside

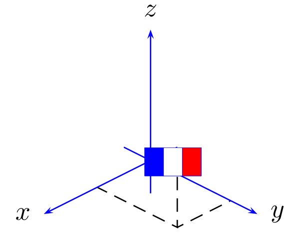
	
\psBox[showInside=false]{-3}{1}{2}	\pstParaboloid[showInside=true]{3}{2}
	
\psBox[showInside=true]{-3}{1}{2}	\pstParaboloid[showInside=false]{3}{2}

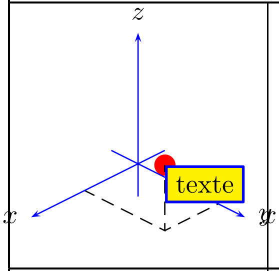
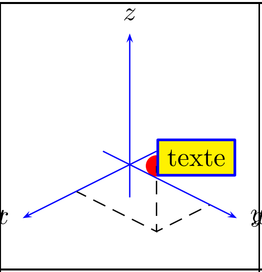
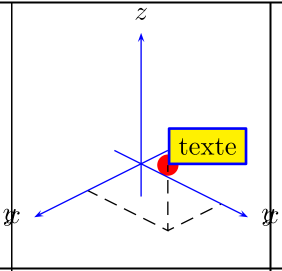
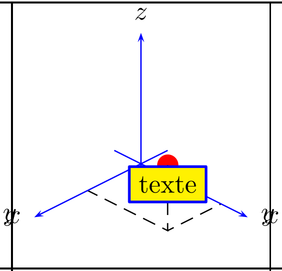
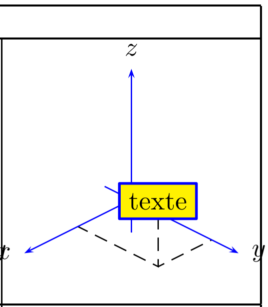
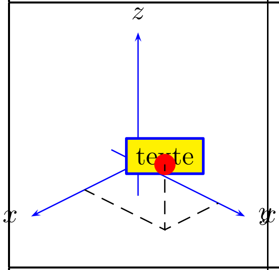
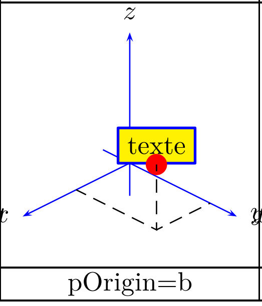
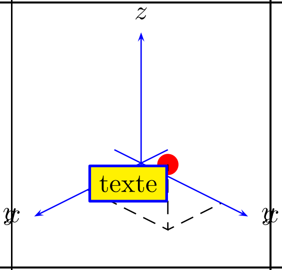
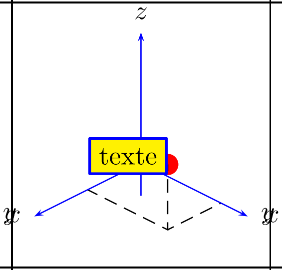
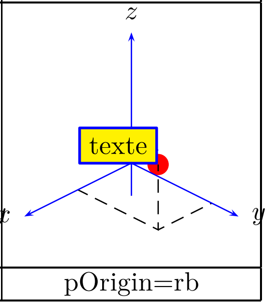
38.0.4 SegmentColor

\pstParaboloid[showInside=false, SegmentColor={[cmyk]{0 0 1 0}}]{4}{5} \pstThreeDSphere[SegmentColor={[cmyk]{0,1,0,0}}](1,-1,2){2}	
	

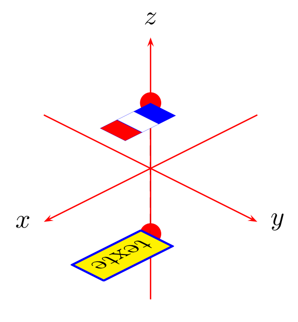
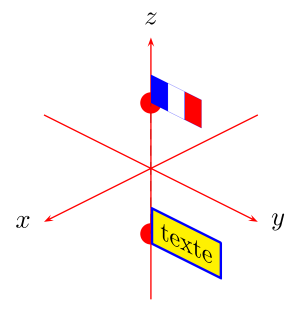
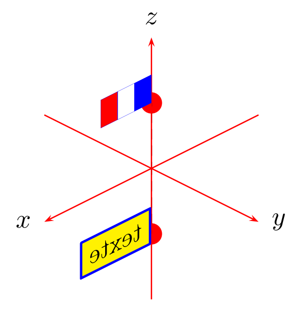
38.1 Placer des objets en 3D

38.1.1 pstThreeDPut

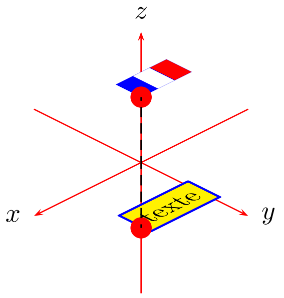
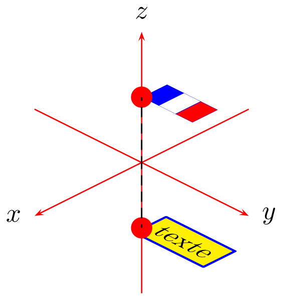
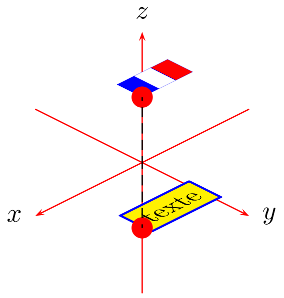
	**\pstThreeDPu**t(2,3,2){\DFR} \pstThreeDDot[drawCoor=true](2,3,2)

\pstThreeDPut[pOrigin=lb](2,3,2){\psframebox{ texte}}				
				
pOrigin=lt	pOrigin=lB	pOrigin=lb	pOrigin=t	pOrigin=c
				
pOrigin=B	pOrigin=b	pOrigin=rt	pOrigin=rB	pOrigin=rb

38.1.2 \pstPlanePut

\pstPlanePut[plane=xy](0,0,3){\DFR} **\pstPlanePut**[plane=xy](0,0,-3){\psframebox{ texte}}		
		
plane=xy	plane=yz	plane=xz

\pstPlanePut[plane=xy,planecorr=normal](0,0,2){\DFR}
\pstPlanePut[plane=xy,planecorr=normal](0,0,-2){\psframebox{texte}}

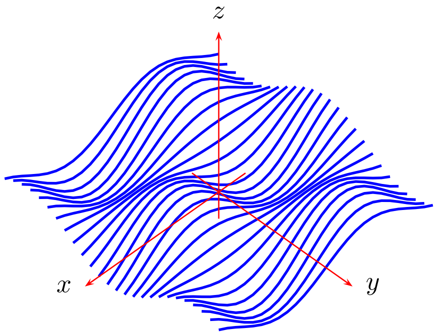
		
planecorr=normal	planecorr=xyrot	planecorr=off

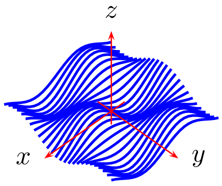
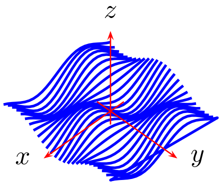
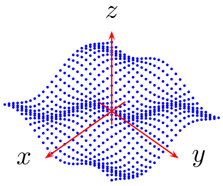
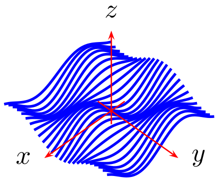
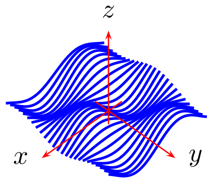
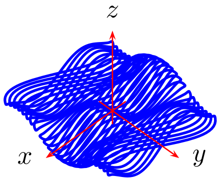
38.2 Créer un graphe en 3D

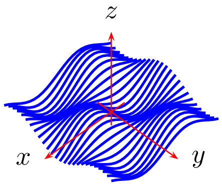
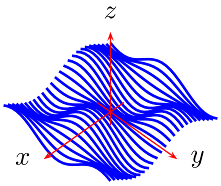
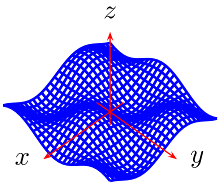
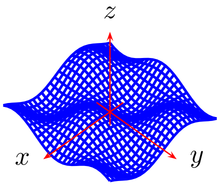
38.2.1 psplotThreeD

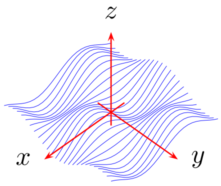
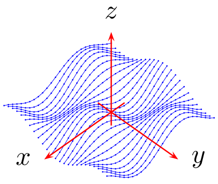
psplotThreeD[algebraic](-4,4)(-4,4) {sin(x)*cos(y)}

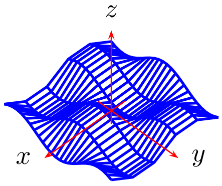
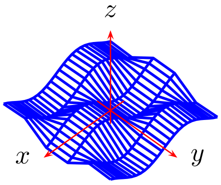
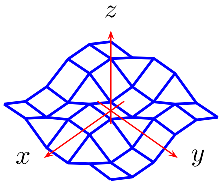
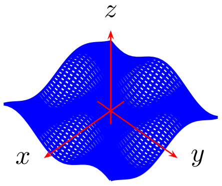
plages pour x et y fonction en x y

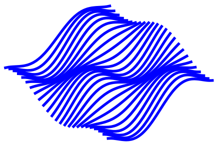
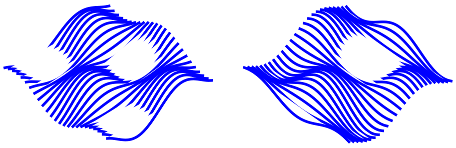


\psplotThreeD[algebraic,plotstyle=line](-4,4)(-4,4){sin(x)*cos(y)}		
		
plotstyle=line	plotstyle=polygon	plotstyle=dots
		
plotstyle=curve	plotstyle=ecurve	plotstyle=ccurve

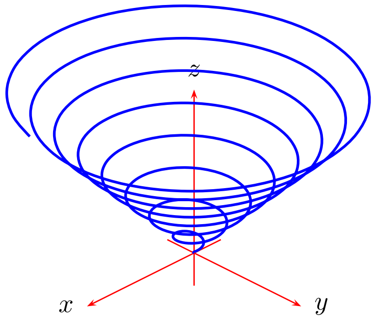
\psplotThreeD[algebraic,drawStyle=xLines](-4,4)(-4,4){sin(x)*cos(y)}			
			
drawStyle=xLines Par défaut	drawStyle=yLines	drawStyle=xyLines	drawStyle=yxLines

\psplotThreeD[algebraic,showpoints=false,linewidth=.1pt] (-4,4)(-4,4){sin(x)*cos(y)}	
	
showpoints=false	showpoints=true
Par défaut	

\psplotThreeD[algebraic,xPlotpoints=5,drawStyle=xyLines](-4,4)(-4,4){sin(x)*cos(y)}			
			
xPlotpoints=5	yPlotpoints=5	yPlotpoints=5 yPlotpoints=5	xPlotpoints=50
Par défaut : xPlotpoints=25 yPlotpoints=25			

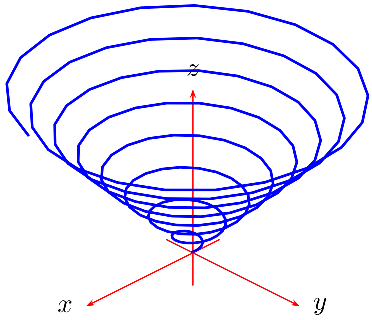
\psplotThreeD[algebraic,hiddenLine=false](-4,4)(-4,4){sin(x)*cos(y)}	
	
hiddenLine=false	hiddenLines=true
Par défaut	

38.2.2 parametricplotThreeD

<table>
<tr><td>\parametricplotThreeD[xPlotpoints=200,plotstyle=curve,algebraic]
(0,50) { t/10*cos(t) | t/10*sin(t) | t/10}
plage pour t 3 fonctions paramétriques</td></tr>
<tr><td> </td></tr>
</table>

38.3 Graphe en 3D à partir d'un fichier de données

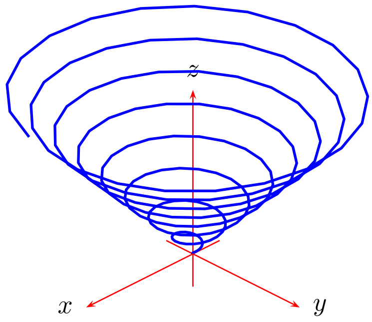
38.3.1 fileplotThreeD



\fileplotThreeD{data3d.txt}

% data3d.txt : fichier de données créé avec Excel

38.3.2 dataplotThreeD

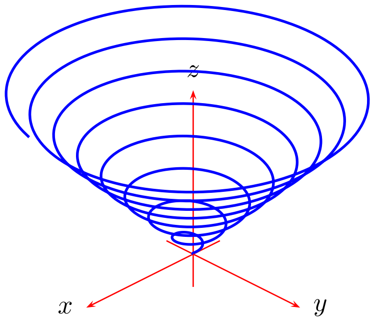


\readdata{\data}{data3d.txt}

% data3d.txt : fichier de données créé avec Excel

\dataplotThreeD[plotstyle=line]{\data}

38.3.3 listplotThreeD



\readdata{\data}{data3d.txt}

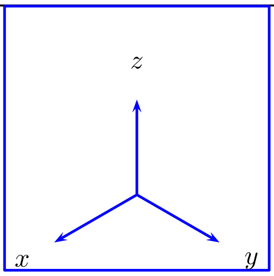
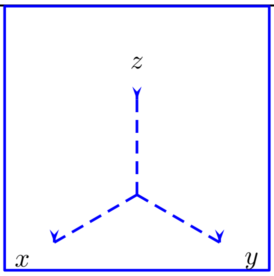
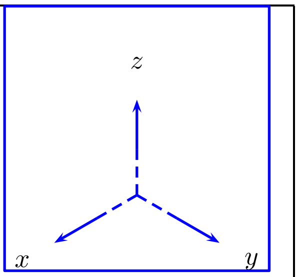
% data3d.txt : fichier de données créé avec Excel

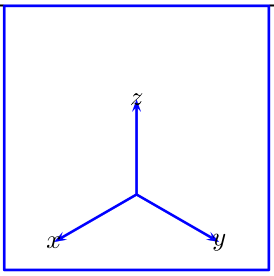
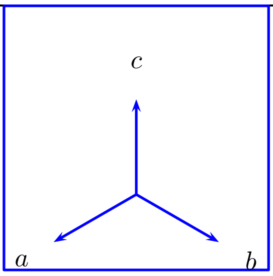
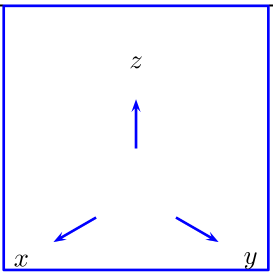
\listplotThreeD[plotstyle=curve]{\data}

39 Créer un dessin en 3D avec pst-solides3d

Utilisation du module **pst-solides3d**
Cette partie sera complétée dans uns version ultérieure

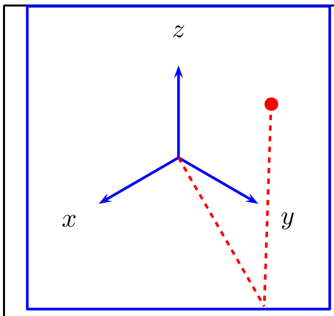
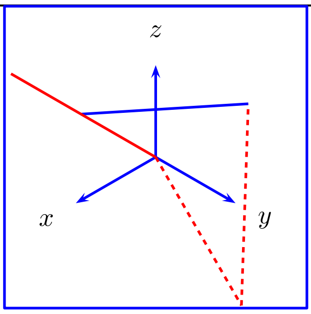
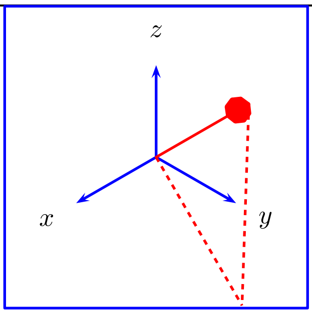
39.1 Axes

		
axesIIID(0,0,0)(2,2,2)	**axesIIID**(2,2,2)(2,2,2)	**axesIIID**(1,1,1)(2,2,2)

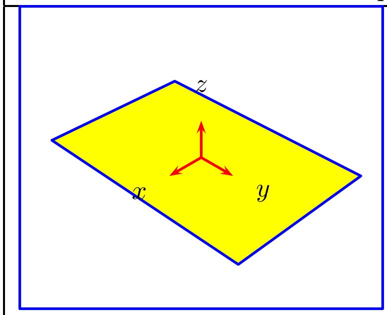
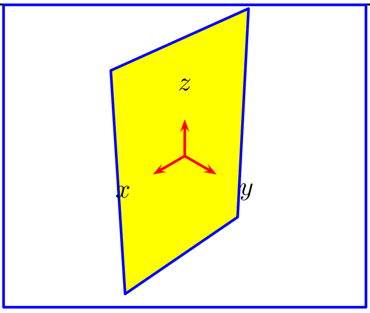
		
labelsep=0cm	axisnames={a,b,c}	showOrigin=false
Par défaut : labelsep=5pt	Par défaut : axisnames={x,y,z}	Par défaut : showOrigin=true

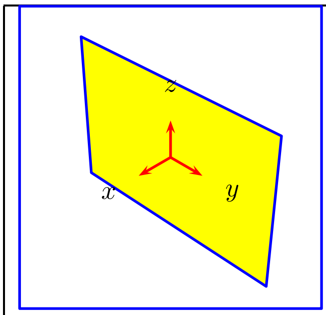
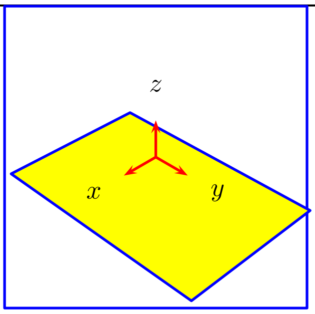
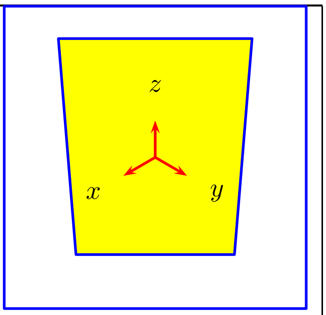
39.2 Élement en 3D

39.2.1 point, ligne, vecteur

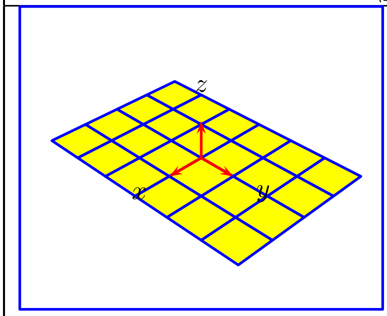
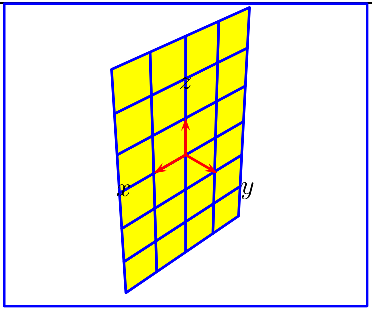
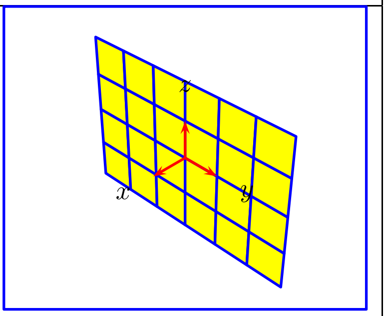
		
[object=point,args=1 2 2]	[object=line,args=0 -1 0 1 2 2]	[object=vecteur,args=1 2 2]

39.2.2 Plan

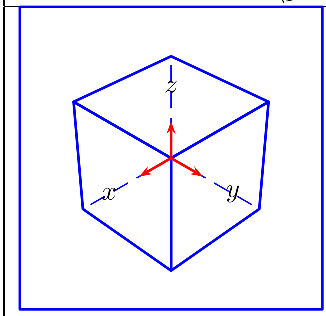
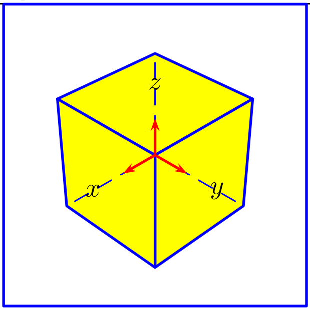
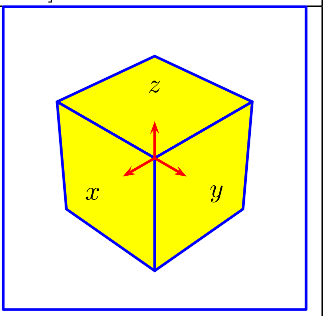
\psSolid[object=plan,definition=equation,args={[0 0 1 0]},base=-2 2 -3 3] coeff de l'équation ax+by+cz+d = 0	
	
args={[0 0 1 0]}	args={[0 1 0 0]}

		
args=[1 0 0 0]	args=[0 0 1 1]	args=[1 1 0 0]

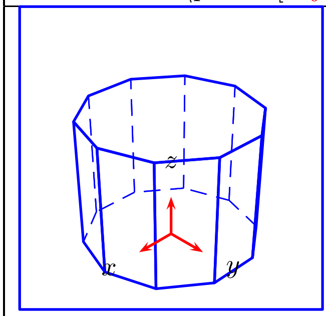
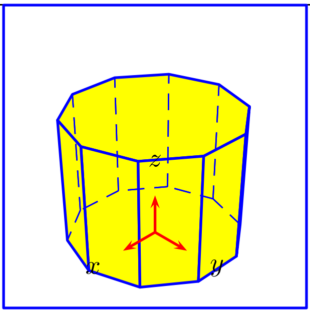
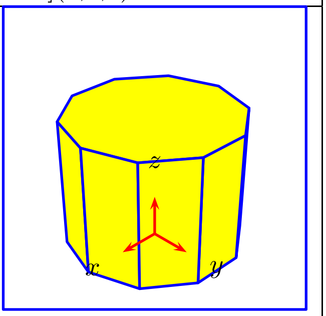
39.2.3 Grille

\psSolid[object=grille,base=-2 2 -3 3]		
		
Par défaut	RotX=90	RotY=90

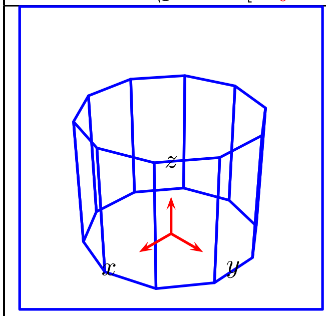
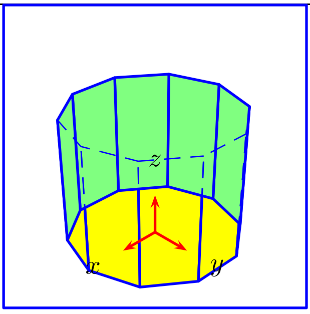
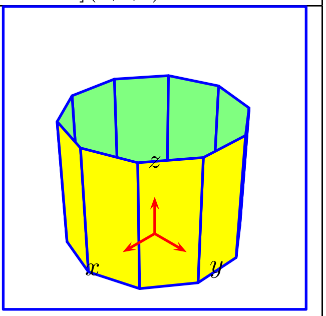
39.2.4 cube

\psSolid[object=cube,a=3,action=draw]		
		
action=draw	action=draw*	action=draw**

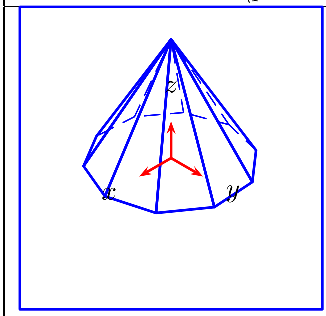
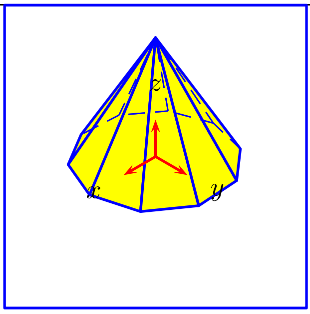
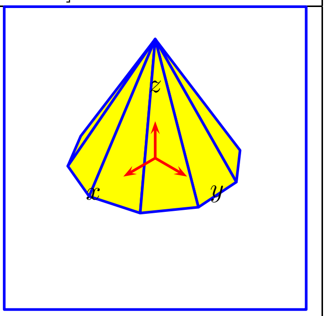
39.2.5 Cylindre

\psSolid[object=cylindre,h=3,r=2,action=draw](0,0,0)		
		
action=draw	action=draw*	action=draw**

39.2.6 cylindre creux

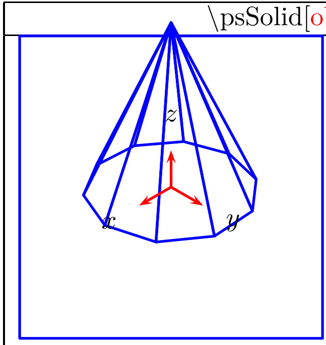
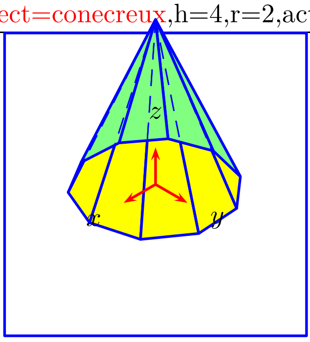
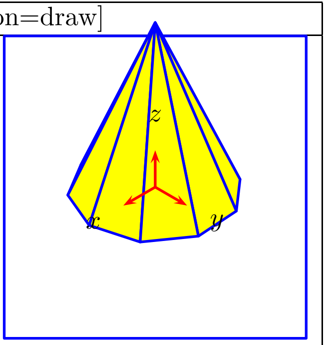
\psSolid[object=cylindrecreux,h=3,r=2,action=draw](0,0,0)		
		
action=draw	action=draw*	action=draw**

39.2.7 Cône

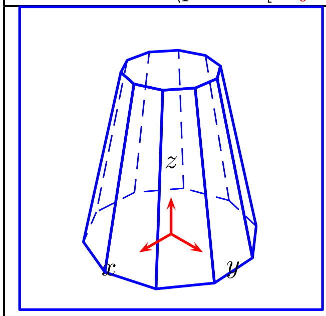
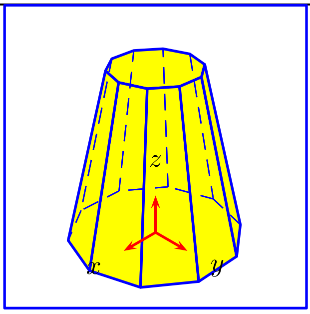
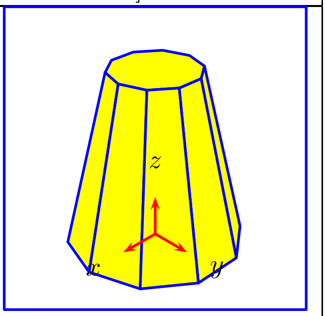
\psSolid[object=cone,h=3,r=2,action=draw]		
		
action=draw	action=draw*	action=draw**

39.2.8 conecreux

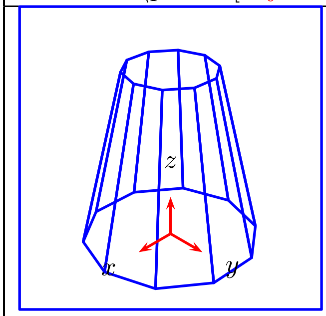
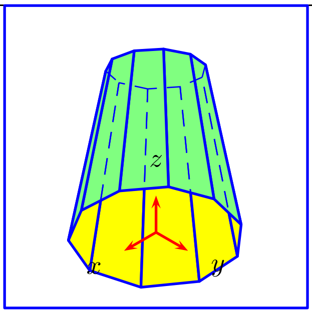
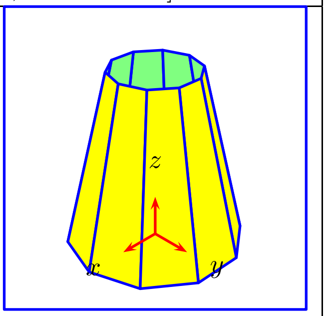
39.2.9 Cône creux

\psSolid[object=conecreux,h=4,r=2,action=draw]		
		
action=draw	action=draw*	action=draw**

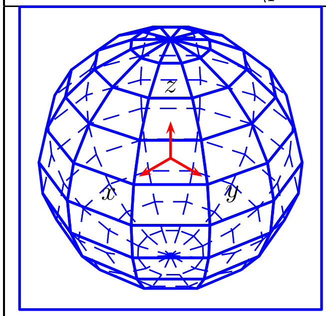
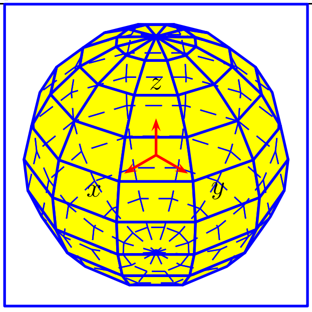
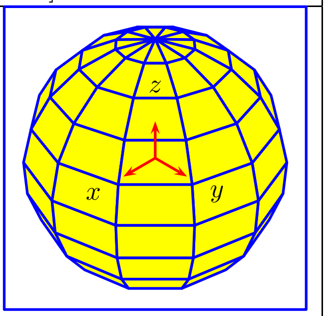
39.2.10 Tronc de cône

\psSolid[object=tronccone,r0=2,r1=1,h=4,action=draw]		
		
action=draw	action=draw*	action=draw**

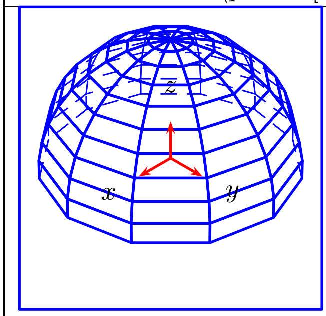
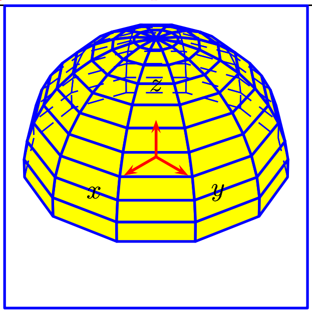
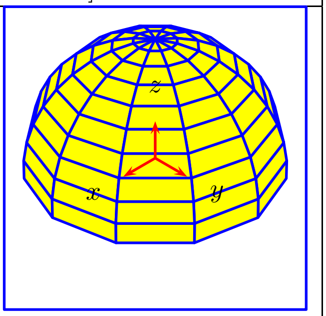
39.2.11 Tronc de cône creux creux

\psSolid[object=troncconecreux,r0=2,r1=1,h=4,action=draw]		
		
action=draw	action=draw*	action=draw**

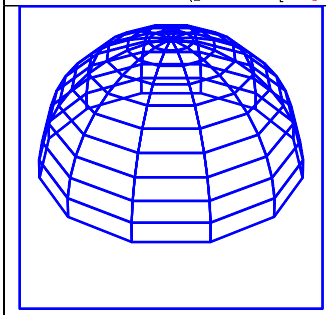
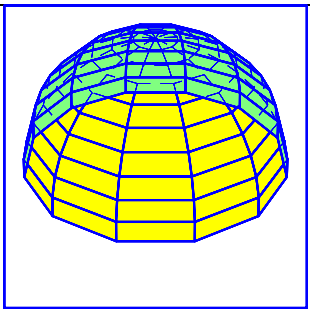
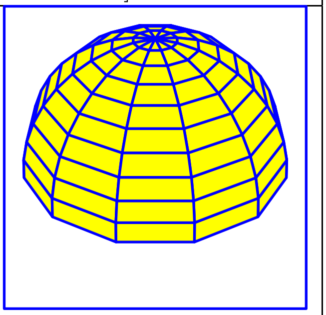
39.2.12 sphere

\psSolid[object=sphere,r=1,action=draw]		
		
action=draw	action=draw*	action=draw**

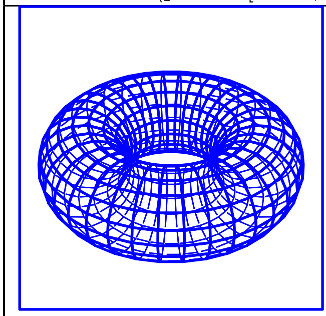
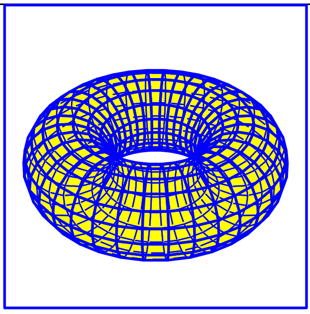
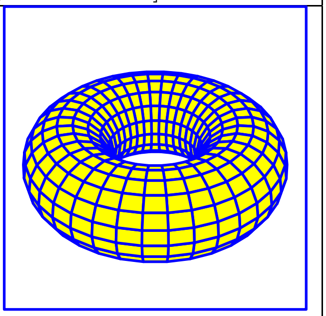
39.2.13 Calotte sphérique

\psSolid[object=calottesphere,r=3,action=draw]		
		
action=draw	action=draw*	action=draw**

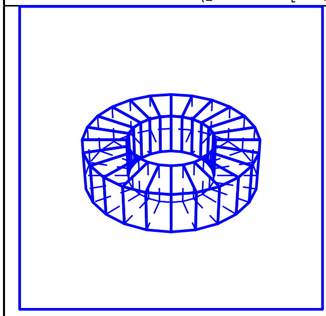
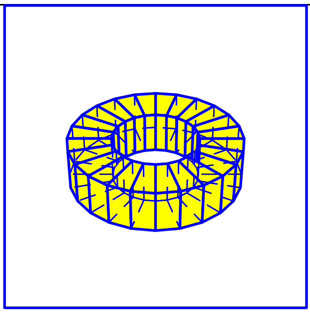
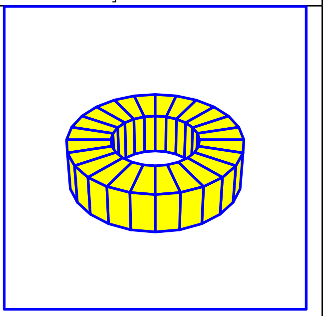
39.2.14 calotte spherique creuse

\psSolid[object=calottespherecreuse,r=3,action=draw]		
		
action=draw	action=draw*	action=draw**

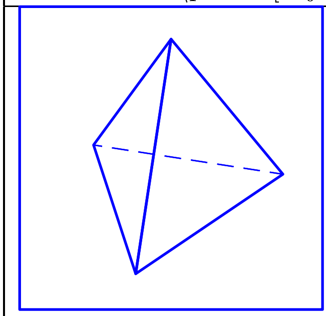
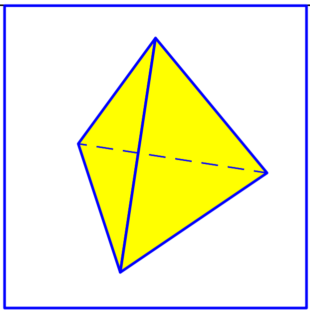
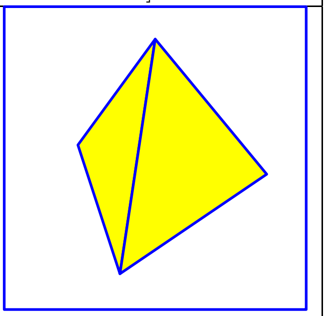
39.2.15 Tore

\psSolid[r1=2,r0=1, object=tore,ngrid=18 36,action=draw]		
		
action=draw	action=draw*	action=draw**

39.2.16 Anneau

\psSolid[object=anneau,h=1,R=2,r=1,action=draw]		
		
action=draw	action=draw*	action=draw**

39.2.17 tetrahedron

<table>
<tr><td colspan="3">\psSolid[object=tetrahedron,r=1,RotZ=30,action=draw]</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>action=draw</td><td>action=draw*</td><td>action=draw**</td></tr>
</table>

39.2.18 parallelepiped

<table>
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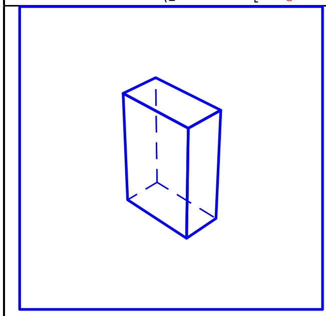
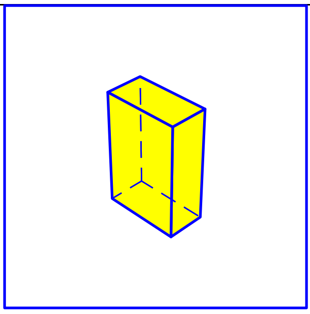
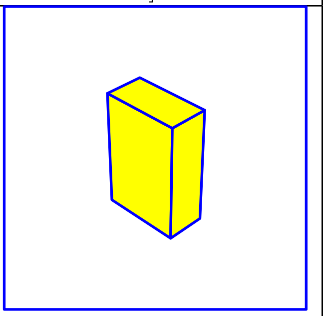
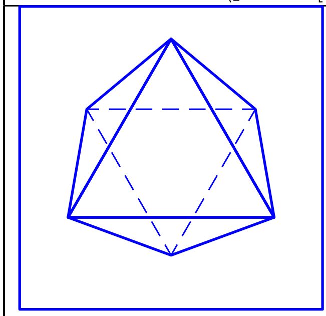
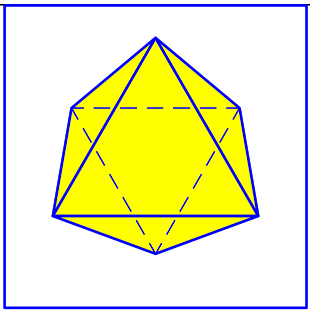
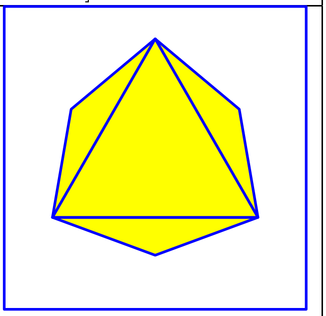
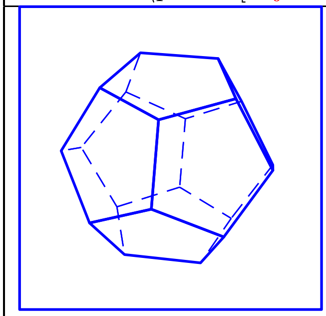
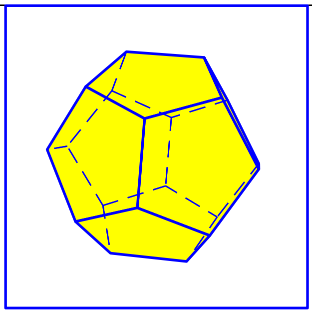
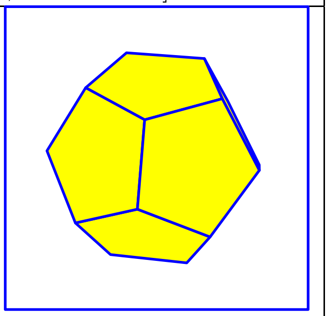
<tr><td></td><td></td><td></td></tr>
<tr><td>action=draw</td><td>action=draw*</td><td>action=draw**</td></tr>
</table>

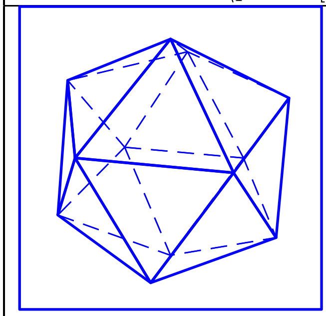
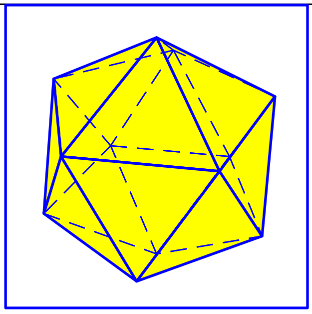
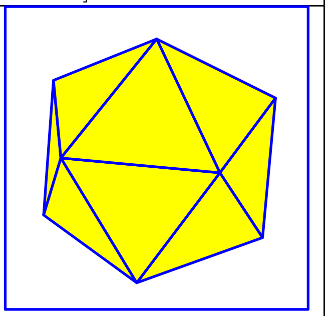
39.2.19 octahedron

<table>
<tr><td colspan="3">\psSolid[object=octahedron,a=30,action=draw]</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>action=draw</td><td>action=draw*</td><td>action=draw**</td></tr>
</table>

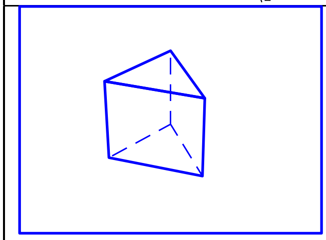
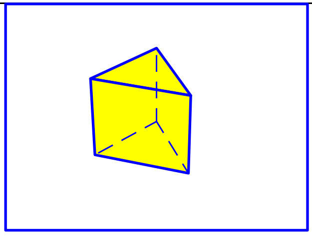
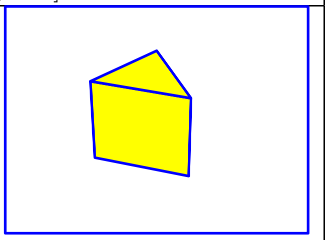
39.2.20 dodecahedron

\psSolid[object=dodecahedron,a=2.5,RotZ=90,action=draw]		
		
action=draw	action=draw*	action=draw**

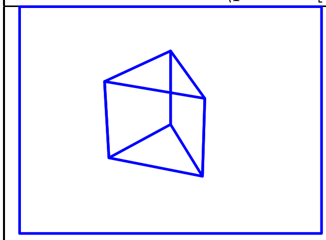
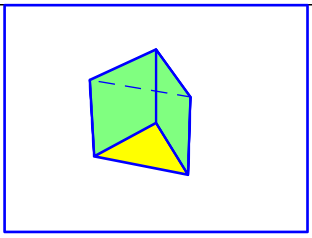
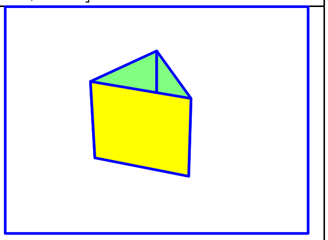
39.2.21 icosahedron

\psSolid[object=icosahedron,a=3,action=draw]		
		
action=draw	action=draw*	action=draw**

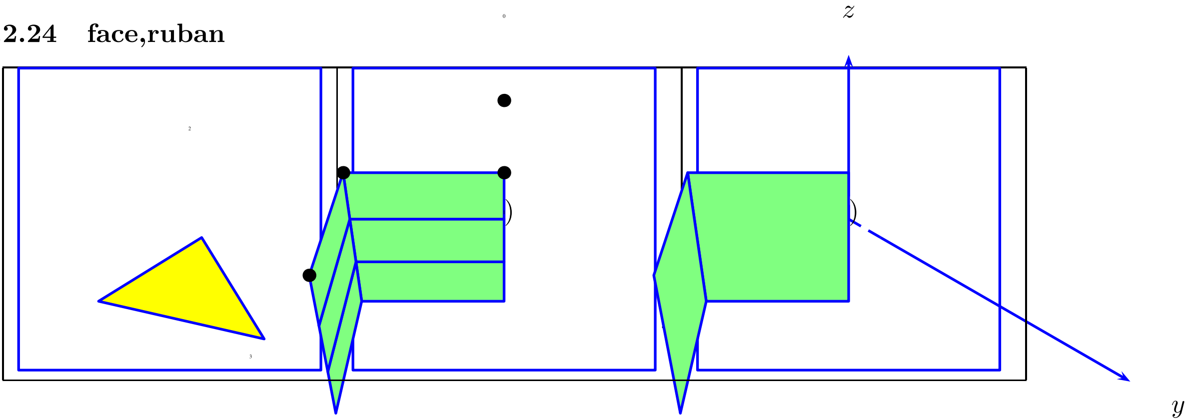
39.2.22 Prisme

\psSolid[object=prisme,action=draw,h=4]		
		
action=draw	action=draw*	action=draw**

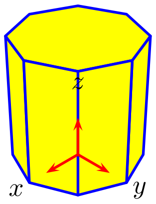
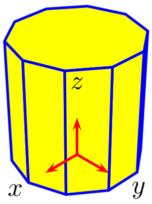
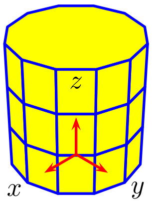
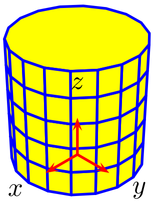
39.2.23 Prisme creux

\psSolid[object=prismecreux,action=draw,h=4]		
		
action=draw	action=draw*	action=draw**

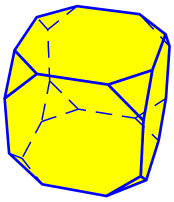
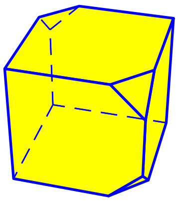
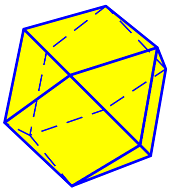
39.2.24 face,ruban

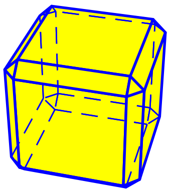
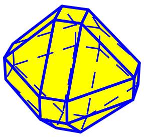
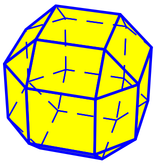


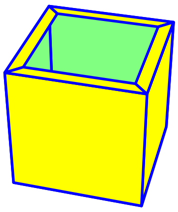
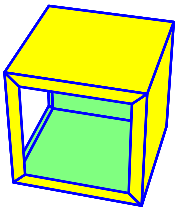
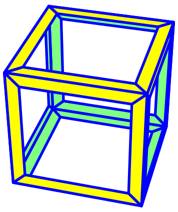
39.3 Mode

\psSolid[object=cylindre,h=3,r=1.5,mode=1](0,0,0)			
			
mode=1	mode=2	mode=3	mode=4

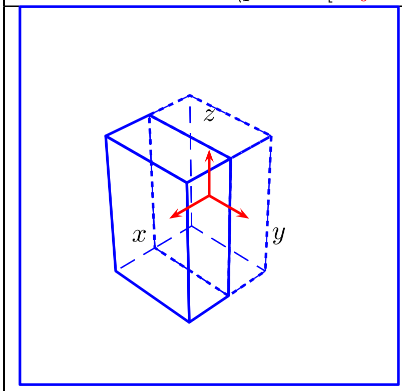
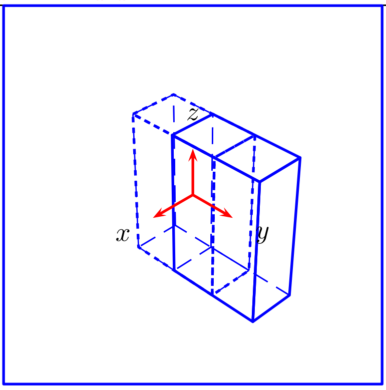
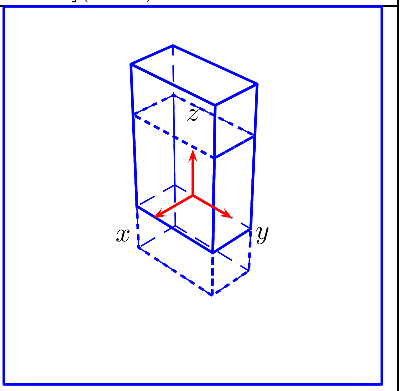
39.3.1 Options

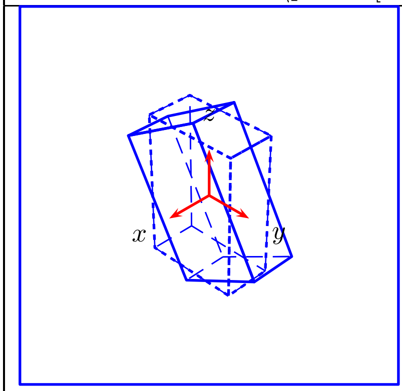
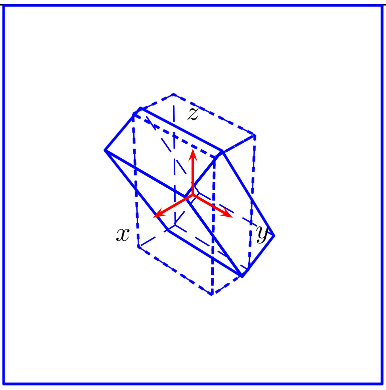
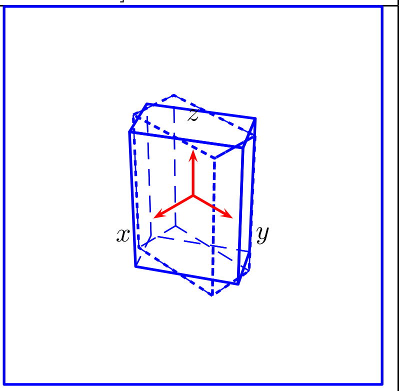
\psSolid[object=cube,a=3,action=draw*,trunc=all,RotZ=30]		
		
trunc=all	trunc=0 2 4	trunccoeff=.5

\psSolid[object=cube,a=3,action=draw,chanfrein,RotZ=30]		
		
chanfrein	chanfrein,chanfreincoeff=.2	chanfrein,chanfreincoeff=.5

\psSolid[object=cube,a=3,action=draw**,hollow,affinage=0,RotZ=30]		
		
hollow ,affinage=3	hollow,,affinage=3 4	hollow,affinage=all

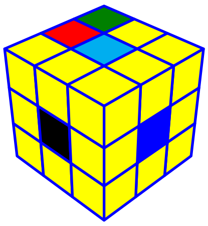
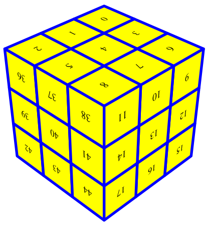
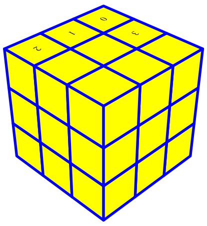
39.4 Positionnement

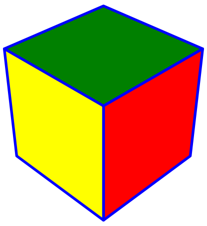
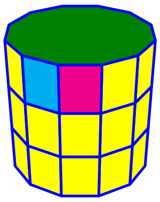
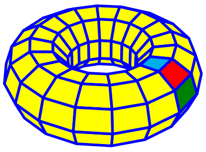
\psSolid[object=parallelepiped,a=1,b=2,c=3,action=draw](1 0 0)		
		
(1 0 0)	(0 1 0)	(0 0 1)

\psSolid[object=parallelepiped,a=1,b=2,c=3,action=draw]		
		
RotX=30	RotY=30	RotZ=30

39.5 Coloriage numérotation

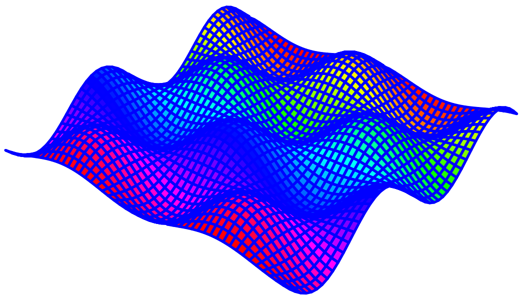
oloring and numbering

\psSolid[fcol=0 (green) 1 (red) 4 (cyan) 13 (blue) 40 (black), object=cube,mode=3]		
		
fcol=0 (green) 1 (red) ...	numfaces=all	numfaces=0 1 2 3

\psSolid[fcol=0 (green) 1 (red) 2 (cyan) 3 (magenta), object=parallelepiped,mode=3]		
		
fcol= 0 (green) 1 (red) ...	numfaces=all	numfaces=0 1

39.6 Dans une prochaine version

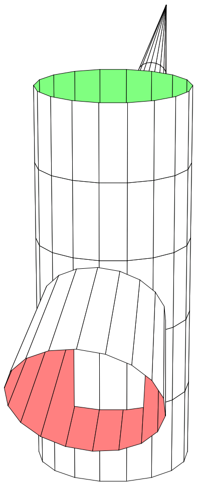
39.6.1 Surface d'après une équation



```
\psSurface[algebraic,ngrid=.25 .25,hue=0 1](-6,-6)(6,6){sin(x) *cos(y)}
```

39.6.2 Fusion de 2 solides

usion of two solids



```
\psset{solidmemory}

\psSolid[object=cylindrecreux,h=10,r=2,fillcolor=white,mode=4,name=A1,incolor=green!50](0,0,-3)
\psSolid[object=conecreux,h=15,r=2,RotY=-60,fillcolor=white,incolor=red!50,mode=5,name=B1](4,0,0)
\psSolid[object=fusion,action=draw**,base=A1 B1,](0,0,0)
\composeSolid
```

A formules en langage postcript

formule	en PostScript	valeur
$2+3$	2 3 add	5
$2+2$	2 dup add	4
$2-3$	2 -3 add	-1
$2*3$	2 3 mul	6
$10/2$	10 2 div	5.0
3^2	3 2 exp	9.0
$\sqrt{3}$	3 sqrt	1.73
$\sin(30)$	30 sin	0.5
$\cos(30)$	30 cos	0.86
$sin^2(30)$	30 sin 2 exp	0.25
$sin(5^2)$	5 2 exp sin	0.42

B Les modules étudiés dans ce document

Modules chargés automatiquement avec le module pst-all

name	page	documentation [1]
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pstricks-add	les additifs	[2]
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pst-coil	86	[5]
pst-grad	92	[11]
pst-fill	95	[7]
pst-text	97	[22]
pst-plot	108	[18]
multido	178	[24]
pst-tree	199	[23]
pst-3d		
pst-eps		

Autres modules

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Additifs annuels

année	documentation[1]
2005	[13]
2008	[14]
2010	[15]
2013	[16]

---

[1] Vous pouvez les trouver pour la distribution Texlive dans le répertoire : \texlive\2011\tesmf-dist\doc\generic

C Sources

Références

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[3] pst-3dplot-doc.pdf version 1.94 69 pages 🇬🇧

[4] pst-bezier-doc.pdf version 0.01 10 pages 🇬🇧

[5] pst-coil-doc.pdf version 1.06 14 pages 🇬🇧

[6] pst-eucl-doc.pdf version 1.51 52 pages 🇬🇧

[7] pst-fill.pdf version 1.00 37 pages 🇬🇧

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[9] pst-fun-doc.pdf version 0.04 11 pages 🇬🇧

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[11] pst-grad-doc.pdf version 1.06 11 pages 🇬🇧

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[17] pst-node-doc.pdf version 1.30 : 53 pages 🇬🇧

[18] pst-plot-doc.pdf version 1.40 : 92 pages 🇬🇧

[19] pst-poly-doc.pdf version 1.61 : 22 pages 🇬🇧

[20] pst-slpe.pdf version 1.31 16 pages 🇬🇧

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[22] pst-text-doc.pdf version 1.06 11 pages 🇬🇧

[23] pst-tree-doc.pdf version 1.12 24 pages 🇬🇧

[24] multido-doc.pdf version 1.42 4 pages 🇬🇧

[25] xcolor.pdf version 2.11 65 pages 🇬🇧

[26] animate.pdf 6th December 2012 23 pages 🇬🇧

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