TikZ Cheat Sheet

Anders O.F. Hendrickson
Concordia College, Moorhead, Minnesota
May 17, 2010

Coordinate Specifications

		library needed
`(`x`,`y`)`	Cartesian coordinates	
`(`θ`:`r`)`	polar coordinates	
`($ (A) + {sin(60)}*(B) $)`	coordinate calculations	`calc`
`($ (A)!.25!(B) $)`	partway calculations	`calc`
`($ (A)!3cm!(B) $)`	3cm from (A) in direction of (B)	`calc`
`($ (A)!1.2!30:(B) $)`	stretch by 1.2, then rotate by 30°	`calc`
`($ (A)!(B)!(C) $)`	projection of point B onto line $\overline{AC}$	`calc`
`($ (A)!(B)!30:(C) $)`	project B onto line $\overline{AC}$, then rotate by 30°	`calc`
`\node[above=1cm of somenode.north]`	position new node 1cm above existing anchor	`positioning`

General

`\coordinate (X) at (3,5);`	name a point X
`\node[`*options*`] (X) at (3,5) {};`	place a node and name it X

Paths

`\path (A) rectangle (B);`	rectangle
`\path (A) -- (B);`	line
`\path (A) -- (B) (C) -- (D);`	move from (B) to (C) without drawing
`\path (A) circle (4);`	circle of radius 4
`\path (A) ellipse(3 and 2);`	ellipse of width 6 and height 4
`\path (A) arc(`θ_1`:`θ_2`:`r`) (B);`	circular arc of radius r from angle θ_1 to θ_2
`\path (A) arc(`θ_1`:`θ_2`:`r_1 `and` r_2`) (B);`	elliptical arc
`\path (A) .. controls (C1) and (C2) .. (B);`	Bézier curve
`\path (A) grid (B);`	a grid options: `step`, `xstep`, `ystep`, `helplines`
`\path (A) parabola (B);`	parabola (several options for bending)
`\path (A) sin (B);`	sine curve from $(0,0)$ to $(\pi/2,1)$
`\path (A) cos (B);`	cosine curve from $(0,0)$ to $(\pi/2,1)$
`-- cycle`	return to start and join up nicely

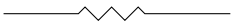
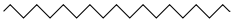
Path Options

`[rounded corners]`, `[rounded corners=10pt]` smooth all corners in the path

`[loop]`

Path widths	**Path dashing**	**Arrowheads**	
`[ultra thin]`	`[solid]`	`[-stealth]`	⟶
`[very thin]`	`[dotted]`	`[-latex]`	→
`[thin]`	`[densely dotted]`	`[-to]`	⟶
`[semithick]`	`[loosely dotted]`		
`[thick]`	`[dashed]`		
`[very thick]`	`[densely dashed]`		
`[ultra thick]`	`[loosely dashed]`		

Path Decorations

`straight zigzag`		`decorations.pathmorphing`
`random steps`		`decorations.pathmorphing`
`saw`		`decorations.pathmorphing`
`zigzag`		`decorations.pathmorphing`
`bent`		`decorations.pathmorphing`
`bumps`		`decorations.pathmorphing`
`coil`		`decorations.pathmorphing`
`snake`		`decorations.pathmorphing`

Let-operations

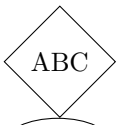
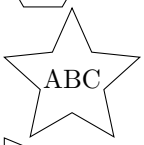
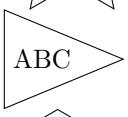
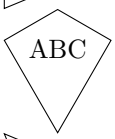
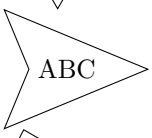
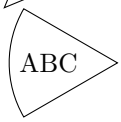
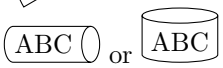
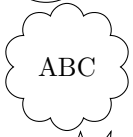
`\path ... let \p1 = ($ (B)-(A) $) in ...`	save a point's coordinates
`... \x1`	x-coordinate of point `\p1`
`... \y1`	y-coordinate of point `\p1`
`... \p1`	string containing coordinates of `\p1`
`... {veclen(\x1,\y1)}`	length of vector (x, y)
`\path ... let \n1 = {sin(60)} in ...`	save a number

Layers

```
\pgfdeclarelayer{background}
\pgfdeclarelayer{foreground}
\pgfsetlayers{background,main,foreground}

\begin{pgfonlayer}{background}
  \node {This node will appear on the background layer.};
\end{pgfonlayer}
```

Node Shapes

		library needed
circle		
rectangle		
coordinate		
diamond		shapes.geometric
ellipse		shapes.geometric
trapezium		shapes.geometric
semicircle		shapes.geometric
regular polygon		shapes.geometric
star		shapes.geometric
isosceles triangle		shapes.geometric
kite		shapes.geometric
dart		shapes.geometric
circular sector		shapes.geometric
cylinder	 or	shapes.geometric
forbidden sign		shapes.symbols
cloud		shapes.symbols
starburst		shapes.symbols
signal		shapes.symbols
tape		shapes.symbols
cross out		shapes.misc
strike out		shapes.misc
rounded rectangle		shapes.misc
chamfered rectangle		shapes.misc