

TikZ coordinates: memoir

In-Sung Cho

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# 1 Introduction

## Graphic basics:

imaginary pen  
current point

path  
stroke (or draw)  
fill

Where to put pictures (with tikz)?

location and size

tex box – size

coordinates – location

move

tikz picture box

```
\tikz{<tikz codes>}
```

or

```
\begin{tikzpicture}
```

```
<tikz codes>
```

```
\end{tikzpicture}
```

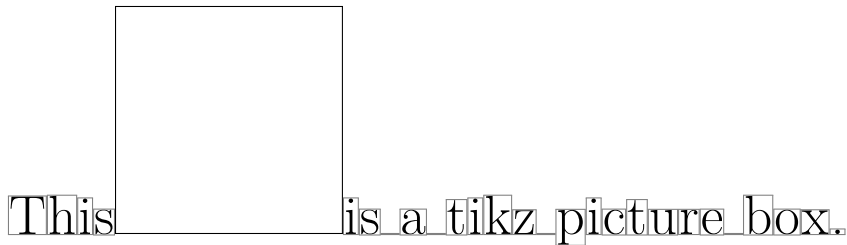
tikz coordinates

absolute coordinates

relative coordinates

## 1.1 tikz picture box

```
%%\usepackage{tikz}
%%\begin{document}
% tikz picture box
\begin{tikzpicture}
  <tikz codes>
\end{tikzpicture}
```



```
This\begin{tikzpicture}
  \draw (2,2) rectangle (5,5); % not from (0,0)
\end{tikzpicture}is a tikz picture box.
```

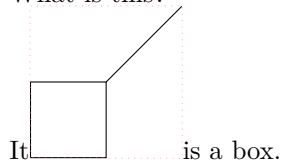


## 1.2 picture box sizes

```
% default
```

```
What is this?\par  
It\begin{tikzpicture}  
  \draw (0,0) rectangle (1,1);  
  \draw (1,1) -- (2,2);  
\end{tikzpicture}is a box.
```

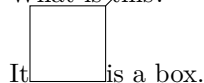
What is this?



```
% [us as bounding box], \useasboundingbox
```

```
What is this?\par  
It\begin{tikzpicture}  
  \draw [use as bounding box] (0,0) rectangle (1,1);  
  \draw (1,1) -- (2,2);  
\end{tikzpicture}is a box.
```

What is this?



```
% [overlay]
```

```
What is this?\par  
It\begin{tikzpicture}[overlay]  
  \draw [use as bounding box] (0,0) rectangle (1,1);  
  \draw (1,1) -- (2,2);  
\end{tikzpicture}is a box.
```

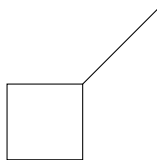
What is this?

It is a box.

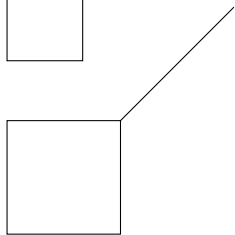
See also `trim left=1cm` and `trim right=1cm` options.

### 1.3 box sizes: scale, xscale, and yscale

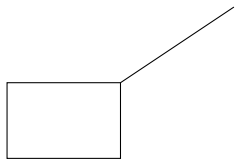
```
\begin{tikzpicture}
\draw (0,0) rectangle (1,1);
\draw (1,1) -- (2,2);
\end{tikzpicture}
```



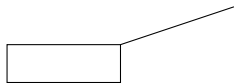
```
\begin{tikzpicture}[scale=1.5] % scale
\draw (0,0) rectangle (1,1);
\draw [overlay] (1,1) -- (2,2); % overlay
\end{tikzpicture}
```



```
\begin{tikzpicture}[xscale=1.5] % xscale
\draw (0,0) rectangle (1,1);
\draw (1,1) -- (2,2);
\end{tikzpicture}
```



```
% xscale, yscale
\begin{tikzpicture}[xscale=1.5,yscale=.5]
\draw (0,0) rectangle (1,1);
\draw (1,1) -- (2,2);
\end{tikzpicture}
```



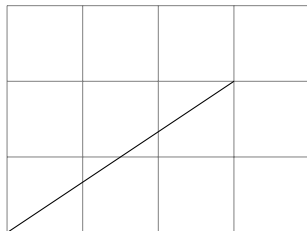
## 2 Coordinates: Basics

## 2.1 Cartesian coordinates

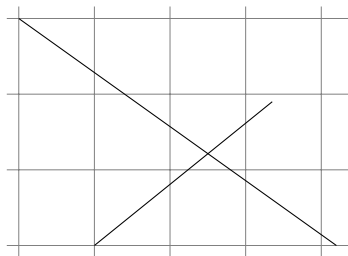
canvas coordinate system: ( $\langle x \rangle$ ,  $\langle y \rangle$ )

example: (3,2), (3cm,20pt)

```
\begin{tikzpicture}
\draw[help lines] (0,0) grid (4,3);
\coordinate (A) at (0,0);
\coordinate (B) at (3,2);
\draw (A) -- (B);
\end{tikzpicture}
```



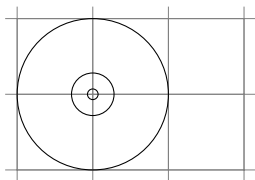
```
\begin{tikzpicture}[show background grid]
\draw (-1+2,0) coordinate (A)
(3cm+10pt,2cm-1mm) coordinate (B)
(2*3-6,2^3-10/2) coordinate (C);
\draw (A) -- (B);
\draw (C) -- (.2\paperwidth+1cm,0);
\end{tikzpicture}
```



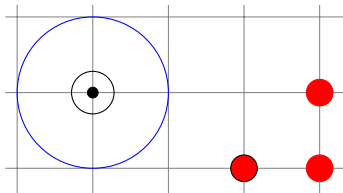
## 2.2 dots and circles

```
\draw [<opt>] (<coor>) circle (<radius dim>);  
\draw [fill,<opt>] (<coor>) circle (<radius dim>);  
\draw [fill=<color>,<opt>] (<coor>) circle (<radius dim>);  
% draw: line, fill: interior
```

```
\begin{tikzpicture}[show background grid]  
\draw [help lines] (0,0) grid (3,2);  
\draw (1,1) circle (1cm);  
\draw (1,1) circle (8pt);  
\draw (1,1) circle (2pt);  
\end{tikzpicture}
```

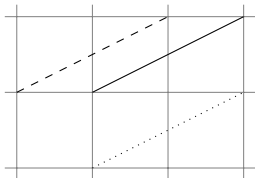


```
% dot = (small filled) circle  
\begin{tikzpicture}[show background grid]  
\draw [blue] (1,1) circle (1cm);  
\draw (1,1) circle (8pt);  
\draw [fill] (1,1) circle (2pt);  
\draw [fill=red] (3,0) circle (5pt); % black  
\draw [fill,red] (4,0) circle (5pt); % draw=red  
\filldraw [red] (4,1) circle (5pt);  
\end{tikzpicture}
```

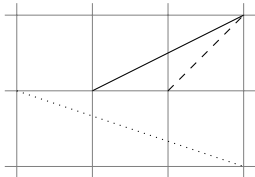


## 2.3 xshift, yshift, and shift

```
\begin{tikzpicture}[show background grid]
\draw (1,1) -- (3,2);
\draw [xshift=-1cm,dashed] (1,1) -- (3,2);
\draw [yshift=-1cm,dotted] (1,1) -- (3,2);
\end{tikzpicture}
```

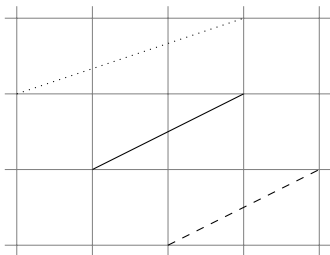


```
\begin{tikzpicture}[show background grid]
\draw (1,1) -- (3,2);
\draw [dashed] ([xshift=1cm]1,1) -- (3,2);
\draw [dotted] ([xshift=-1cm]1,1) --
([yshift=-2cm]3,2);
\end{tikzpicture}
```



[shift={(<coor>)}]

```
\begin{tikzpicture}[show background grid]
\draw (1,1) -- (3,2);
\draw [dashed,shift={(1,-1)}] (1,1) -- (3,2);
\draw [dotted] ([shift={(-1,1)}]1,1) --
([yshift=1cm]3,2);
\end{tikzpicture}
```

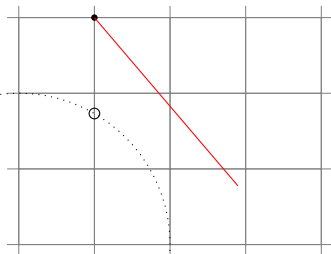


## 2.4 polar coordinates

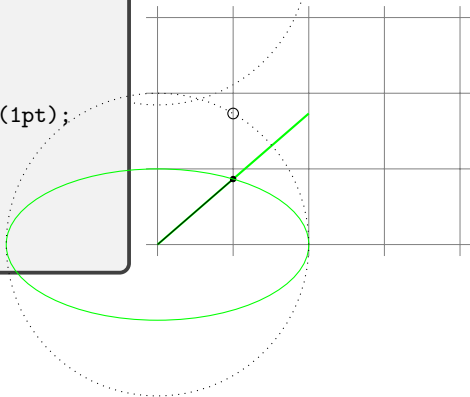
canvas polar coordinate system: (<angle>:<radius>)

canvas polar coordinate system: (<angle>:<x radius> and <y radius>)

```
\begin{tikzpicture}[show background grid]
\draw[help lines,use as bounding box](0,0)grid(4,3);
\draw (60:2) circle (2pt);
\draw [fill] (1,3) circle (1pt);
\draw [red] (1,3) -- (15:3);
\draw [dotted] (0,0) circle (2cm);
\end{tikzpicture}
```



```
\begin{tikzpicture}[show background grid]
\useasboundingbox (0,0) rectangle (4,3);
\draw [green,thick] (0,0) -- (2,1.732);
\draw [fill] (0,0)--(60:2cm and 1cm)circle(1pt);
\draw [green] (0,0) ellipse (2cm and 1cm);
\draw (60:2) circle (2pt);
\draw [dotted] (0,0) circle (2cm);
\end{tikzpicture}
```

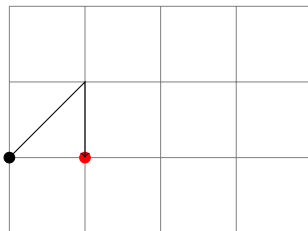


### 3 Relative coordinates

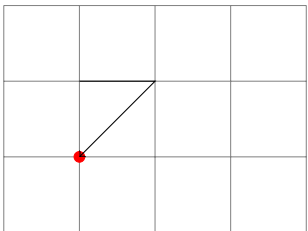


### 3.1 relative coordinates: current point and + and ++

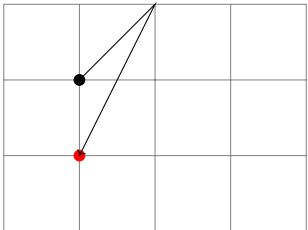
```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\filldraw [red] (1,1) circle (2pt);
\draw [->] (1,1) (0,1) -- +(1,1) -- (1,1);
\filldraw (0,1) circle (2pt); % liftpen, moveto,
lineto
\end{tikzpicture}
```



```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\filldraw [red] (1,1) circle (2pt);
\draw [->] (1,1) +(0,1) -- +(1,1) -- (1,1);
\end{tikzpicture}
```

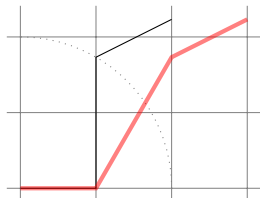


```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\filldraw [red] (1,1) circle (2pt);
\draw [->] (1,1) ++(0,1) -- +(1,1) -- (1,1);
\filldraw (1,2) circle (2pt);
\end{tikzpicture}
```



## 3.2 turn: rotational relative coordinates

```
\begin{tikzpicture}[show background grid]
\draw [dotted,gray] (2,0) arc (0:90:2);
\draw (0,0) -- (1,0) -- (60:2cm) -- +(1,.5);
\draw [ultra thick,red,opacity=.5]
      (0,0) -- (1,0) -- ([turn]60:2cm) -- +(1,.5);
\end{tikzpicture}
```



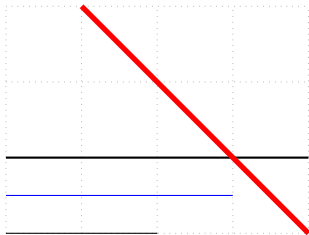
## 4 Basic Graphics

## 4.1 lines and polygons: -- and cycle

```
\draw [<opt>] (coor1) -- (coor2);  
\draw [<opt>] (coor1) -- (coor2) -- (coord3);  
\draw [<opt>] (coor1) -- (coor2) -- (coord3) -- cycle;
```

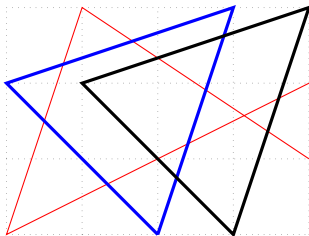
**% lines**

```
\begin{tikzpicture}  
\draw [help lines,dotted] (0,0) grid (4,3);  
\draw (0,0) -- (2,0);  
\draw [blue] (0,.5) -- (3,.5);  
\draw [thick] (0,1) -- (4,1);  
\draw [line width=2pt,red] (1,3) -- (4,0);  
\end{tikzpicture}
```



**% polygons: cycle**

```
\begin{tikzpicture}  
\draw [help lines,dotted] (0,0) grid (4,3);  
\draw [red] (4,1) -- (1,3) -- (0,0) -- (4,2);  
\draw [very thick,blue] (2,0)--(0,2)--(3,3)--(2,0);  
\draw [very thick] (3,0)--(1,2)--(4,3)--cycle;  
\end{tikzpicture}
```

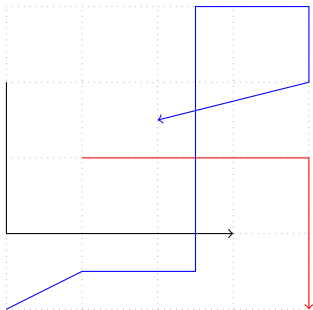


## 4.2 lines: |- and -|

```
\draw [<opt>] (coor1) |- (coor2);
```

```
\draw [<opt>] (coor1) -| (coor2);
```

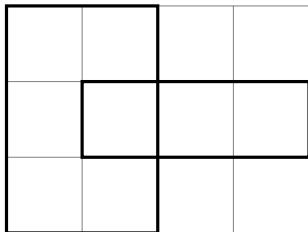
```
\begin{tikzpicture}
\draw [help lines,dotted] (0,0) grid (4,4);
\draw [->] (0,3) |- (3,1);
\draw [->,red] (1,2) -| (4,0);
\draw [->,blue]
(0,0)--(1,.5) -| (2.5,4) -| (4,3)--(2,2.5);
\end{tikzpicture}
```



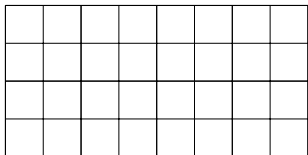
### 4.3 rectangles and grid

```
\draw [<opt>]      (coor1) rectangle (coor2);  
\draw [<opt>]      (coor1) grid      (coor2);  
\draw [help lines] (coor1) grid      (coor2);
```

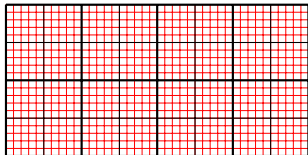
```
\begin{tikzpicture}  
\draw [help lines] (0,0) grid (4,3);  
\draw [very thick] (0,0) rectangle (2,3);  
\draw [very thick] (1,1) rectangle (4,2);  
\end{tikzpicture}
```



```
\begin{tikzpicture}  
\draw [step=.5cm,very thin] (0,0) grid (4,2);  
\draw (0,0) grid (4,2);  
\end{tikzpicture}
```

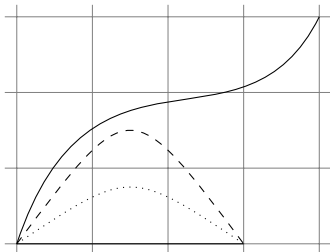


```
\begin{tikzpicture}  
\draw [step=1mm,red,ultra thin] (0,0) grid (4,2);  
\draw [step=.5cm] (0,0) grid (4,2);  
\draw [thick] (0,0) grid (4,2);  
\end{tikzpicture}
```

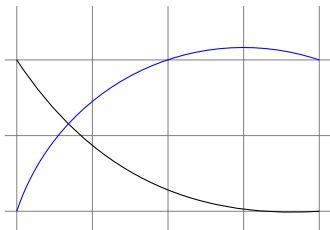


## 4.4 curves: controls and to

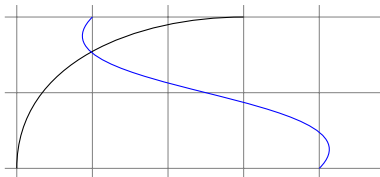
```
% .. controls (coor) and (coor) ..  
\begin{tikzpicture}[show background grid]  
\draw (0,0) -- (3,0);  
\draw [dotted] (0,0) .. controls (1.5,1) .. (3,0);  
\draw [dashed] (0,0) .. controls (1.5,2) .. (3,0);  
\draw (0,0) .. controls (1,3) and (3,1) .. (4,3);  
\end{tikzpicture}
```



```
% to [bend left= ,bend right= ]  
\begin{tikzpicture}[show background grid]  
\draw (0,2) to [bend right] (4,0);  
\draw [blue] (0,0) to [bend left=45] (4,2);  
\end{tikzpicture}
```

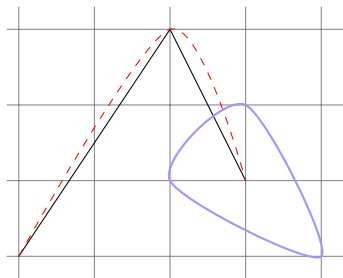


```
% to [out= ,in=]  
\begin{tikzpicture}[show background grid]  
\draw (0,0) to [out=90, in=180] (3,2);  
\draw [blue] (1,2) to [out=-135,in=45] (4,0);  
\end{tikzpicture}
```

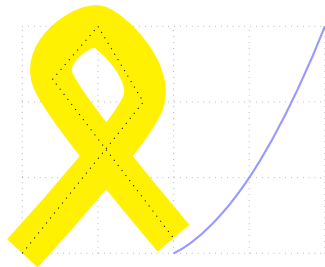


## 4.5 curves: plot coordinates: smooth and tension

```
\begin{tikzpicture}[show background grid]
\draw plot coordinates {(0,0) (2,3) (3,1)}; %%
\draw [dashed,red] plot [smooth]
coordinates {(0,0) (2,3) (3,1)};
\draw [blue!40,thick] plot [smooth cycle]
coordinates {(2,1) (3,2) (4,0)};
\end{tikzpicture}
```



```
% ribbon
\begin{tikzpicture}
\draw [help lines,dotted] (0,0) grid (4,3);
\draw [yellow,line width=5.5mm]
plot [smooth] coordinates
{(0,0) (1.6,2) (1,3) (.4,2.3) (2,.2)};
\draw [dotted] plot coordinates
{(0,0) (1.6,2) (1,3) (.4,2.3) (2,.2)};
\draw [blue!40,thick]
plot [smooth,tension=1] coordinates
{(2,0) (3,1) (4,3)};
\end{tikzpicture}
```

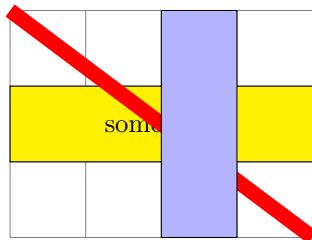




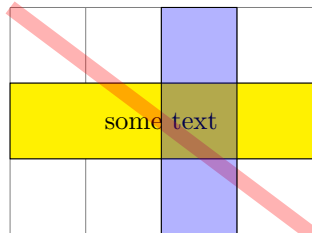
## 5 Opacity and Layers

## 5.1 filling and opacity

```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\draw [fill=yellow] (0,1) rectangle (4,2);
\draw (2,1.5) node {some text};
\draw [red,line width=2mm] (0,3) -- (4,0);
\draw [fill=blue!30] (2,0) rectangle (3,3);
\end{tikzpicture}
```



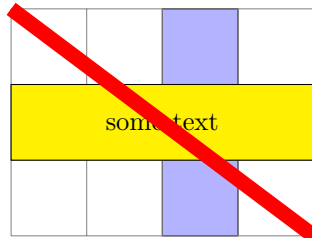
```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\draw [fill=yellow] (0,1) rectangle (4,2);
\draw (2,1.5) node {some text};
\draw [red,opacity=.3,line width=2mm] (0,3) -- (4,0);
\draw [fill=blue,fill opacity=.3]
(2,0) rectangle (3,3);
\end{tikzpicture}
```



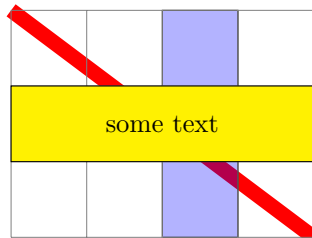
## 5.2 background layer: backgrounds library

```
\usetikzlibrary{backgrounds}  
% scoping with [on background layer]
```

```
\begin{tikzpicture}  
  \draw [help lines] (0,0) grid (4,3);  
  \draw [fill=yellow] (0,1) rectangle (4,2);  
  \draw (2,1.5) node {some text};  
  \draw [red,line width=2mm] (0,3) -- (4,0);  
  \begin{scope}[on background layer]  
    \draw [fill=blue!30] (2,0) rectangle (3,3);  
  \end{scope}  
\end{tikzpicture}
```



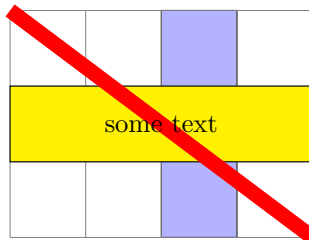
```
\begin{tikzpicture}  
  \draw [help lines] (0,0) grid (4,3);  
  \draw [fill=yellow] (0,1) rectangle (4,2);  
  \draw (2,1.5) node {some text};  
  \begin{scope}[on background layer]  
    \draw [fill=blue,fill opacity=.3]  
      (2,0) rectangle (3,3);  
  \end{scope}  
\end{tikzpicture}
```



### 5.3 more layers

```
% in preamble
\pgfdeclarelayer{background}
\pgfdeclarelayer{behind}
\pgfdeclarelayer{above}
\pgfdeclarelayer{foreground}
\pgfsetlayers{background,behind,main,above,foreground}
% usage: \begin{pgfonlayer}{behind}
%         <tikz codes>
%         \end{pgfonlayer}
```

```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,3);
\draw [fill=yellow] (0,1) rectangle (4,2);
\begin{pgfonlayer}{above}
\draw (2,1.5) node {some text};
\end{pgfonlayer}
\draw [red,line width=2mm] (0,3) -- (4,0);
\begin{pgfonlayer}{behind}
\draw [fill=blue!30,fill]
(2,0) rectangle (3,3);
\end{pgfonlayer}
\end{tikzpicture}
```



## 6 Coordinates Calculations: calc library

```
\usetikzlibrary{calc}
```

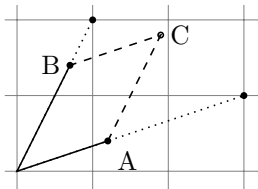
## 6.1 coordinate calculation: basics

```
%% \usetikzlibrary{calc}
% general syntax for coordinates
([<opt>]$<coord calculation>$)
```

`coordinate` computation: `\verb+<factor>*(coord)<modifier>+`

\*([가 나올 때까지 <factor>를 계산하므로, \*와 (를 띄어쓰면 안된다.

```
% linear combination
\begin{tikzpicture}[semithick,show background grid]
\draw [dotted,fill] (0,0) -- ([xshift=1cm]2,1);
\draw [dotted,fill] (0,0) -- (1,2);
\draw [fill] ($.4*(3,1)$) coordinate (A) circle (1pt);
\draw [fill] ($.7*(1,2)$) coordinate (B) circle (1pt);
\draw ($.4*(3,1)+.7*(1,2)$) coordinate (C); %
\draw (A) node [below right] {A} -- (0,0) -- (B);
\draw [dashed] (A) -- (C) -- (B) node [left] {B};
\draw (C) circle (1pt) node [right] {C};
\draw [fill] (1,2) circle (1pt) (3,1) circle (1pt);
\end{tikzpicture}
```

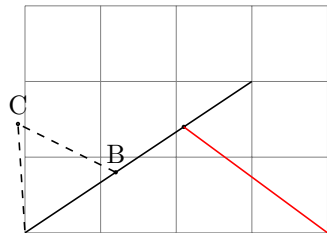


### % affine combination

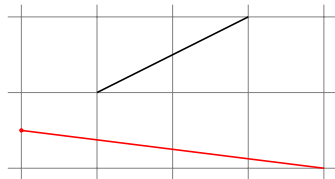
syntax: (<coor1>!<t>!<angle>:(<coor2>)

- affine combination:  $(1 - t)x + ty, t \in R$
- rotate by <angle> around (<coor1>)

```
\begin{tikzpicture}[semithick]
\draw [help lines] (0,0) grid (4,3);
\draw (0,0) -- (3,2);
\draw ($(0,0)!.7!(3,2)$) coordinate (A) circle (.5pt);
\draw [red] (A) -- (4,0);
\draw ($(0,0)!.4!(3,2)$) coordinate (B) circle (.5pt);
\draw ($(0,0)!.4!60:(3,2)$) coordinate (C);
\draw (C) circle (.5pt) node [above] {C};
\draw [dashed] (B) node [above] {B} -- (C) -- (0,0);
\end{tikzpicture}
```

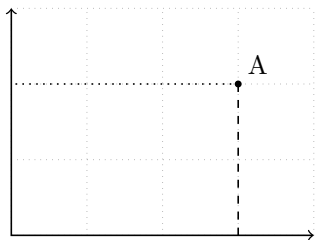


```
\begin{tikzpicture}[semithick,show background grid]
\draw (1,1) -- (3,2);
\draw ($(1,1)!.5!(3,2)$) coordinate (A);
\draw [red] (A) circle (.5pt) -- (4,0);
\end{tikzpicture}
```

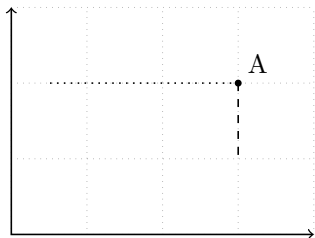


## 6.2 projection to the axes: |- and -|

```
\begin{tikzpicture}[semithick]
\draw [help lines,dotted] (0,0) grid (4,3);
\draw [<->] (0,3) |- (4,0);
\draw (3,2) coordinate (A);
\draw [fill] (A) circle (1pt) node [above right] {A};
\draw (A|-9,0) coordinate (X);
\draw (A|-0,7) coordinate (Y);
\draw [dashed] (A) -- (X);
\draw [dotted] (A) -- (Y);
\end{tikzpicture}
```



```
\begin{tikzpicture}[semithick]
\draw [help lines,dotted] (0,0) grid (4,3);
\draw [<->] (0,3) |- (4,0);
\draw (3,2) coordinate (A);
\draw [fill] (A) circle (1pt) node [above right] {A};
\draw (A|-9,1) coordinate (X);
\draw (A|-1.5,7) coordinate (Y);
\draw [dashed] (A) -- (X);
\draw [dotted] (A) -- (Y);
\end{tikzpicture}
```





## 7 Nodes

## 7.1 nodes: basics

A node is a small part of a picture (drawn after a path is completed).

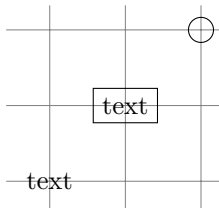
```
% frequently used syntax
% mandatory: last { }
\draw (<coord>) node [<opt>] {<text>};
\node [<opt>] at (<coord>) {<text>;
```

position

shape: rectangle, draw=none (default)

empty text: {}

```
\begin{tikzpicture}[show background grid]
\draw (0,0) node {text};
\draw (1,1) node [draw] {text};
\node at (2,2) [draw,circle] {};
\end{tikzpicture}
```



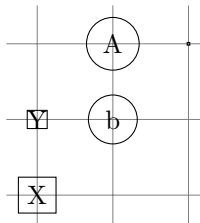
## nodes: basics

inner sep, inner xsep, inner ysep: initially .3333em

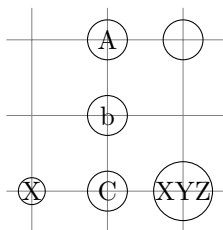
outer sep: no default

minimum size

```
\begin{tikzpicture}[show background grid]
\draw (0,0) node [draw] {X};
\draw (0,1) node [draw,inner sep=0pt] {Y};
\draw (1,2) node [draw,circle] {A};
\draw (1,1) node [draw,circle] {b};
\draw (2,2) node [draw,inner sep=0pt] {};
\end{tikzpicture}
```

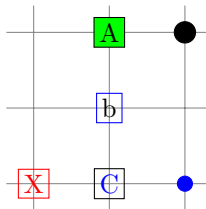


```
\begin{tikzpicture}[inner sep=0pt,show background grid]
\draw (0,0) node [draw,circle] {X};
\draw (1,2) node [draw,circle,minimum size=1.5em] {A};
\draw (1,1) node [draw,circle,minimum size=1.5em] {b};
\draw (1,0) node [draw,circle,minimum size=1.5em] {C};
\draw (2,2) node [draw,circle,minimum size=1.5em] {};
\draw (2,0) node [draw,circle,minimum size=1.5em] {XYZ};
\end{tikzpicture}
```



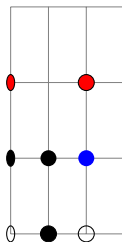
## 7.2 nodes: coloring

```
\begin{tikzpicture}[inner sep=2pt,show background grid]
\draw (0,0) node [draw,red] {X};
\draw (1,2) node [draw,fill=green] {A};
\draw (1,1) node [draw,draw=blue] {b};
\draw (1,0) node [draw,text=blue] {C};
\draw (2,2) node [draw,circle,fill,minimum size=8pt] {};
\draw (2,0) node [draw,circle,blue,fill] {};
\end{tikzpicture}
```



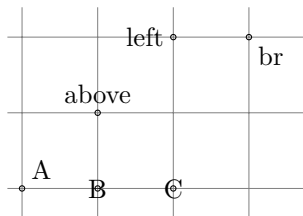
## 7.3 node dots

```
\begin{tikzpicture}[xscale=.5,inner sep=0pt]
\draw [help lines] (0,0) grid (3,3);
\draw (0,0) circle (3pt);
\draw [fill] (0,1) circle (3pt);
\draw [fill=red] (0,2) circle (3pt);
\draw (1,1) node [circle,fill,minimum size=6pt] {};
\draw (1,0) node [draw,circle,fill,minimum size=6pt] {};
\draw (2,1) node [circle,fill=blue,minimum size=6pt] {};
\draw (2,0) node [draw,circle,minimum size=6pt] {};
\draw (2,2) node [draw,circle,fill=red,minimum size=6pt]
{};
\end{tikzpicture}
```

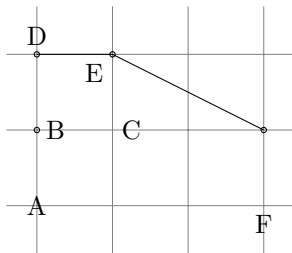


## 7.4 nodes: positioning texts

```
\begin{tikzpicture}[show background grid]
\draw (0,0) circle (1pt) node [above right] {A};
\draw (1,0) node {B};
\draw (2,0) node [centered] {C};
\foreach \xy in {(1,0),(2,0),(1,1),(2,2),(3,2)}
  {\draw \xy circle (1pt);}
\draw (1,1) node [above] {above};
\draw (2,2) node [left] {left};
\draw (3,2) node [below right] {br};
\end{tikzpicture}
```

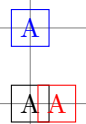


```
\begin{tikzpicture}[show background grid]
\foreach \xx in {(0,1),(0,2),(1,2),(3,1)}
  {\draw \xx circle (1pt);}
\draw (0,0) node {A} ;
\draw (0,1) node [right] {B} ;
\draw (0,1) node [right=1cm] {C} ;
\draw (0,2) node [above] {D}
  -- (1,2) node [below left] {E}
  -- (3,1) node [below=1cm] {F} ;
\end{tikzpicture}
```



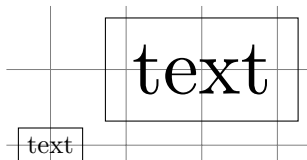
## xshift and yshift

```
\begin{tikzpicture}[show background grid]
\draw (0,0) node [draw] {A} ;
\draw (0,0) node [draw,xshift=10pt,red] {A} ;
\draw (0,0) node [draw,yshift=1cm,blue] {A} ;
\end{tikzpicture}
```

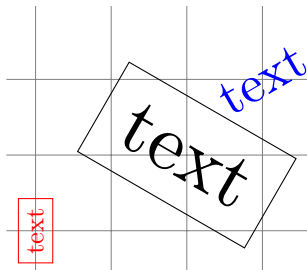


## 7.5 nodes: scaling and rotating

```
\begin{tikzpicture}[show background grid]
\draw (0,0) node [draw] {text};
\draw (2,1) node [draw,scale=3] {text};
\end{tikzpicture}
```



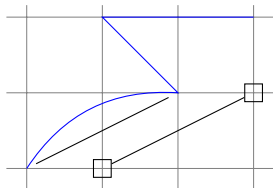
```
\begin{tikzpicture}[show background grid]
\draw (0,0) node [draw,red,rotate=90] {text};
\draw (2,1) node [draw,scale=3,rotate=-30] {text};
\draw (3,2) node [scale=2,rotate=30,blue] {text};
\end{tikzpicture}
```



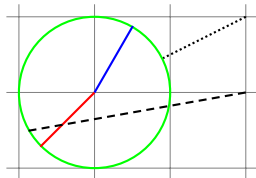
## 7.6 node coordinate system

```
\draw (<coor> node (<node name>) [<opt>] {<text>};  
% (<node name>) can be used as a coordinate  
% in the form (<node name>.<angle>)
```

```
\begin{tikzpicture}[show background grid]  
\path (0,0) node (A) {} (2,1) node (B) {};  
\draw (A) -- (B);  
\path (1,0) node (C) [draw] {};  
\path (3,1) node (D) [draw] {};  
\draw (C) -- (D);  
\draw [blue] (A.center) to [bend left]  
            (B.center) -- (1,2) -- (3,2);  
\end{tikzpicture}
```



```
\begin{tikzpicture}[thick,show background grid]  
\path [green] (0,0) node (A) [draw,circle,minimum  
            size=2cm] {};  
\draw [red] (A.center) -- (A.south west);  
\draw [blue] (A.center) -- (A.60);  
\draw [densely dashed] (2,0) -- (A.-150);  
\draw [densely dotted] (2,1) -- (A); % to the center  
\end{tikzpicture}
```



## 8 Built-in Absolute Nodes



## 8.1 current bounding box

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

```
\begin{tikzpicture}
%% \usepackage{blindtext}
%% \usetikzlibrary{calc,backgrounds}
\node at (0,0) {\parbox{.98\linewidth}{\blindtext}};
\coordinate (SW) at (current bounding box.south west);
\coordinate (NW) at (current bounding box.north west);
\coordinate (SE) at (current bounding box.south east);
\coordinate (NE) at (current bounding box.north east);
\begin{scope}[on background layer]
\path [fill=yellow!50] (SW) rectangle (NE);
\end{scope}
\draw [red,line width=2pt] ($(SE)!.5!(SW)$) -| ($(SE)!2cm!(NE)$);
\end{tikzpicture}
```

## 8.2 current page box

DO NOT FORGET [remember picture, overlay]

And you NEED to compile twice.

Everything on the current page before the picture will be hidden by the picture.

```
\clearpage
```

```
(text not shown: covered by the picture)
```

```
\begin{tikzpicture}[remember picture, overlay,opacity=.3]
```

```
\path (current page.south west) coordinate (SW)
```

```
(current page.south east) coordinate (SE)
```

```
(current page.north west) coordinate (NW)
```

```
(current page.north east) coordinate (NE);
```

```
\begin{scope}[on background layer]
```

```
\fill [draw,black,fill=blue!20] (SE) rectangle (NW); \end{scope}
```

```
\draw (NW) circle (5pt) circle (1cm) circle (2cm);
```

```
\draw (SE) circle (5cm) circle (4cm) circle (3cm) circle (2cm) circle (5pt);
```

```
\end{tikzpicture}
```

```
\subsection{current page box}
```

```
DO NOT FORGET \texttt{[remember picture, overlay]}\par
```

```
And you NEED to compile twice.\par
```

```
Everything on the current page before the picture will be hidden by the picture.
```

### 8.3 remember picture

저 멀리 동해바다 외로운 섬  
오늘도 거센 바람 불어 오겠지  
조그만 얼굴로 바람 맞으니  
독도야 간밤에 잘 잤느냐

금강산 맑은물은 동해로 흐르고  
설악산 맑은물도 동해가는데  
우리네 마음들은 어디로 가는가  
언제쯤 우리는 하나가 될까

백두산 두만강에서 배타고 떠나라  
한라산 제주에서 배타고 간다  
까다가 홀로 섬에 닳을 내리고  
떠오르는 아침해를 맞이해보자

아리랑 아리랑 홀로 아리랑  
아리랑 고개를 넘어가 보자  
가다가 힘들면 쉬어가더라도  
손잡고 가보자 같이 가보자

```
독도\tikz[remember picture,overlay]{\node(A){};}야 간밤에...  
언제쯤 우리는 하나가 될까\tikz[remember picture,overlay]{\node(B){};}  
홀로 섬\tikz[remember picture,overlay]{\node(C){};}에...
```

```
\begin{tikzpicture}[remember picture,overlay,font={\sffamily \scriptsize}]  
\draw (current page.north east) node (Z) [below left,fill=green!50,rounded corners]  
{\parbox{.2\linewidth}{아리랑... 같이 가보자}};  
\end{tikzpicture}
```

```
\begin{tikzpicture}[remember picture,overlay]  
\draw [->,red] (A.center) to [out=-30,in=60] (C.center);  
\draw [->,dashed] (B.center) to [out=0,in=180] (Z.180);  
\draw (current page.center) node [rotate=30,scale=4,opacity=.3,blue]  
{ \bfseries 홀로 아리랑 };  
\end{tikzpicture}
```

## 8.4 More Page Decorating

Practices:

- 김강수, 판면, oblivoir, TikZ, 공주대학교 문서작성 워크숍 2017.
- 이주호, 공주대학교 문서작성 워크숍 포스터, 2017, 2018.

See also:

- Martin Scharrer, tikzpagenodes
- 허혁재, memtikzpagenodes

## 9 References

- Till Tantau, The TikZ and PGF Packages: Manual for version 3.1.4b (<https://github.com/pgf-tikz/pgf>).
- 조인성, 그림과 함수 플로팅 (<http://wiki.ktug.org/wiki/wiki.php/LaTeXWorkshop/2018#s-4>).