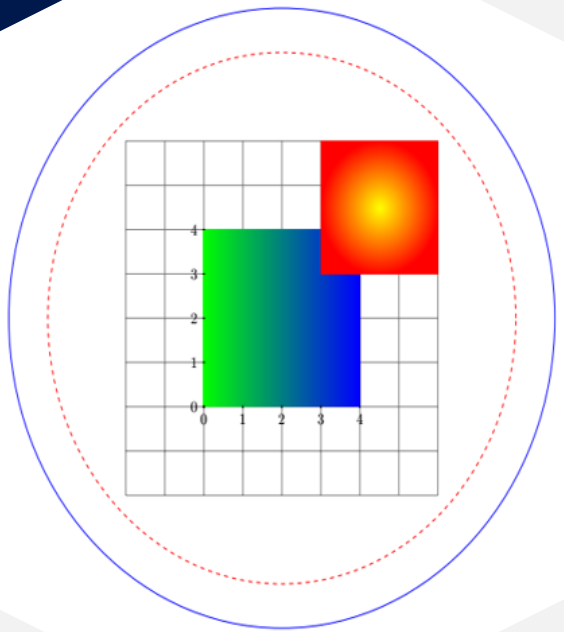
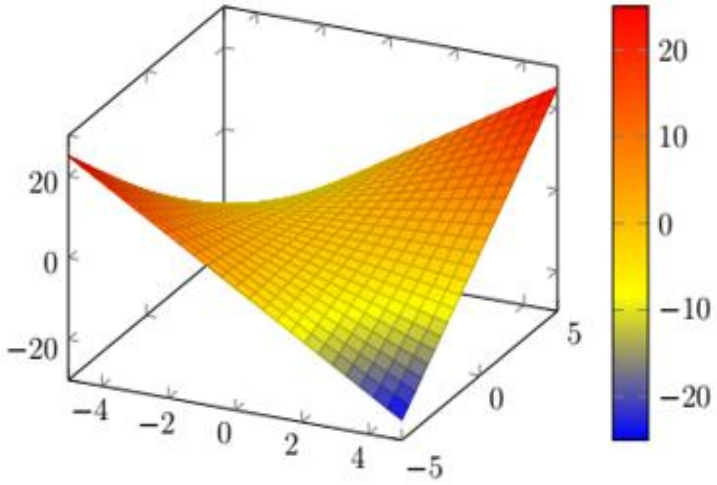
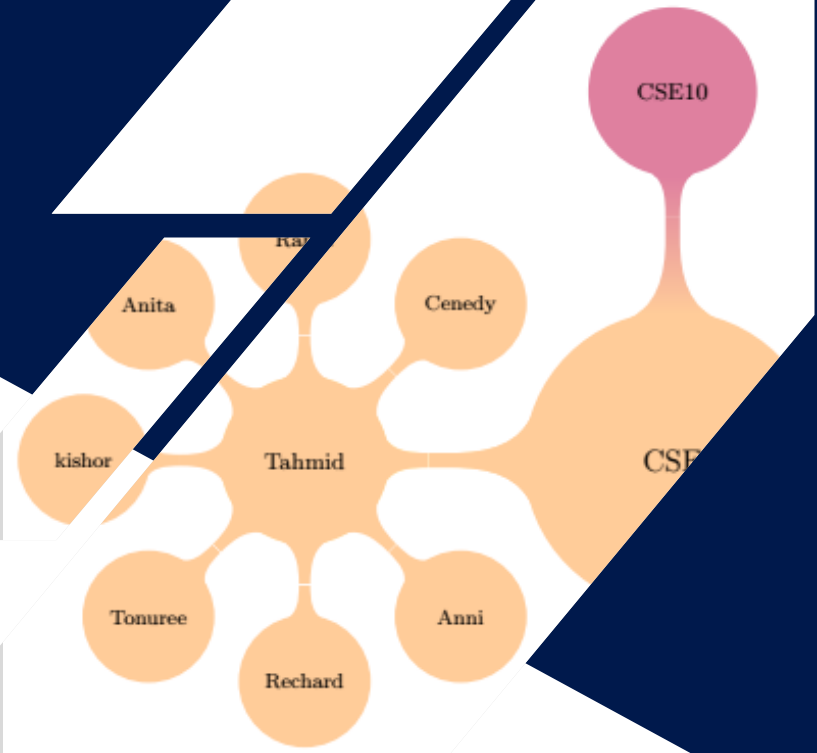




TikZ and Graph

CONTENTS



FR

INTRODUCTION

TikZ is a pair of languages for producing vector graphics (e.g., technical illustrations and drawings) from a geometric/algebraic description, with standard features including the drawing of points, lines, arrows, paths, circles, ellipses and polygons. TikZ is a set of higher-level macros that use PGF. The top-level TikZ commands are invoked as TeX macros, but in contrast with PSTricks the TikZ graphics themselves are described in a language that resembles MetaPost. Till Tantau is the designer

DRAWING IN LATEX USING TIKZ

FR

```
\usepackage{tikz}

\begin{tikzpicture}[option]
<tikz codes>
\end{tikzpicture}
    OR
\tikz[options]{<tikz codes>}

\begin{tikzpicture}[option]
\path[option1][option2] <specification> ;
\end{tikzpicture}
```

\Path[option1][option2]

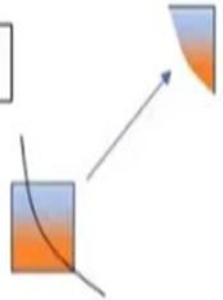
Option1: draw, fill, pattern, clip, shade, use as bounding box

Draw:

Fill:

Shade:

Clip:



Use as bounding box:

Better white space control around the picture

Pattern:

\Path[option1][option2]

Option1: draw, fill, pattern, clip, shade, use as bounding box

Example 1: \path[draw], \path[fill], \path[pattern], \path[clip], \path[use as bounding box]

Example 2: \path[draw, fill], \path[draw, clip], \path[fill, pattern]

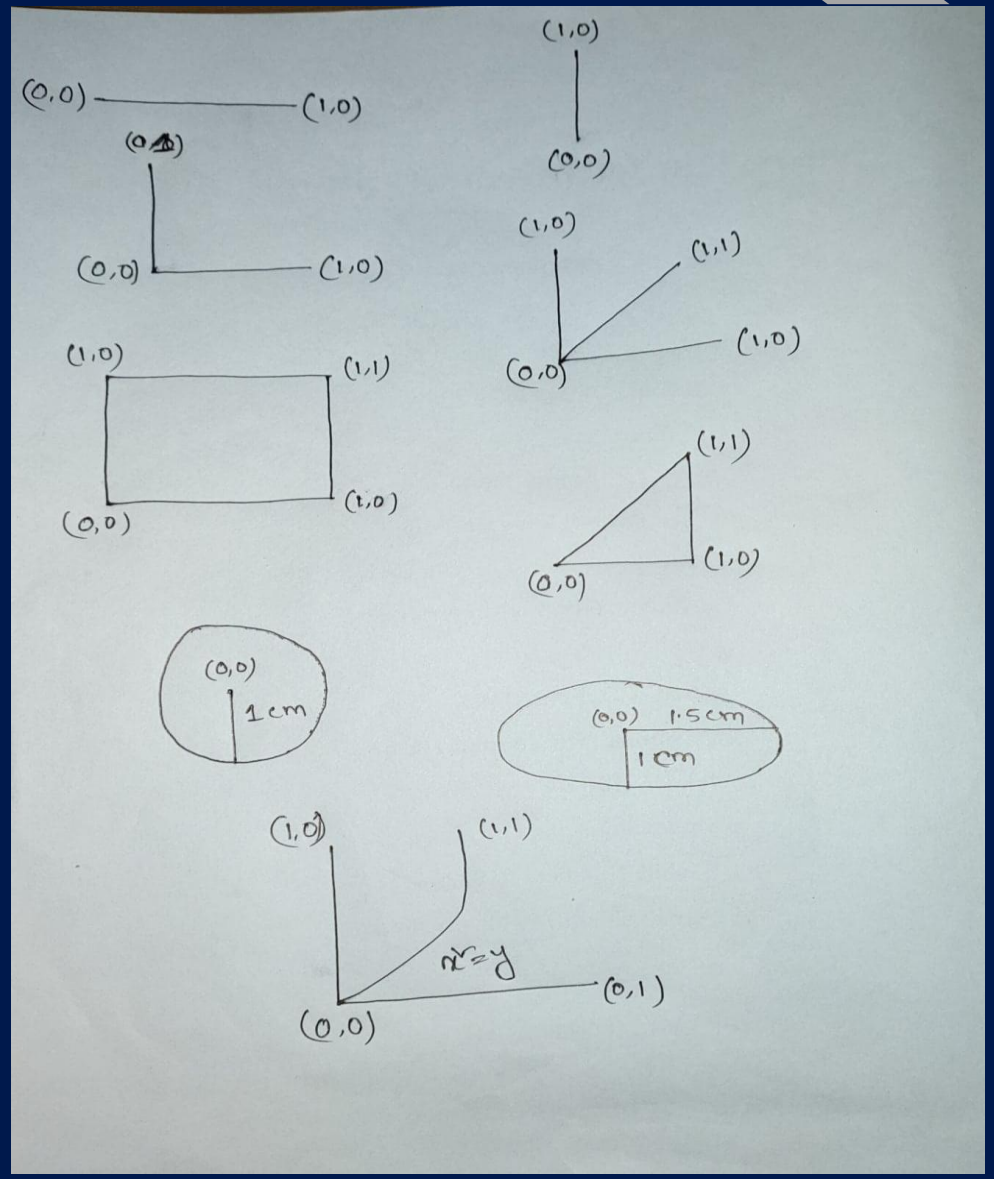
Note: \path with these options can be combined to \option1,

\path[option1] ≡ \option1

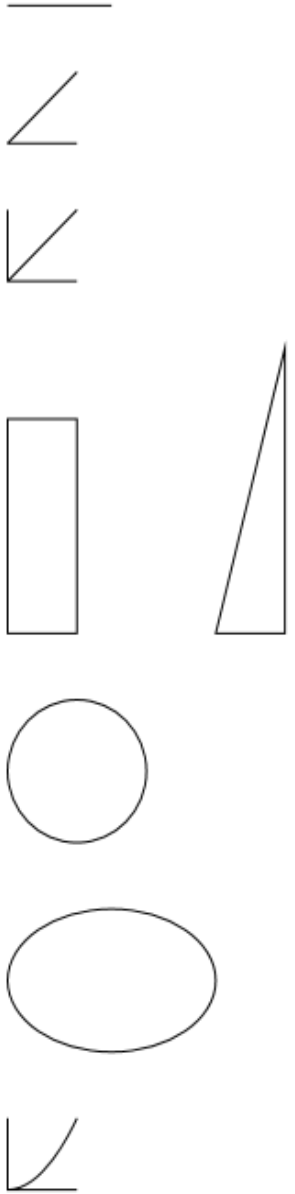
Example: \draw, \fill, \pattern, \clip, \useasboundingbox, \drawfill, \drawclip, \fillpattern

```
\begin{tikzpicture}
  \option1[option2]<specification>;
    \end{tikzpicture}
```

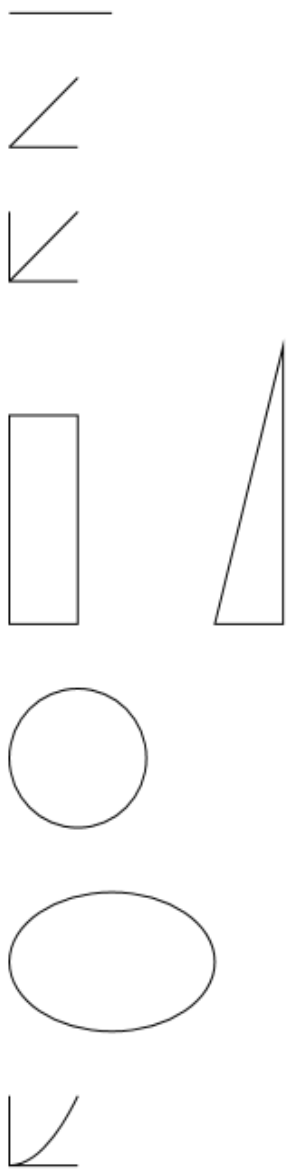
FR


(0,0)
(1,0)
(1,0)
(0,0)
(0,0)
(1,0)
(1,0)
(0,0)
(1,1)
(1,0)
(1,0)
(1,1)
(0,0)
(1,0)
(1,1)
(0,0)
(1,0)
(0,0)
1cm
(0,0)
1.5cm
1cm
(1,0)
(1,1)
$x^2=y$
(0,1)
(0,0)

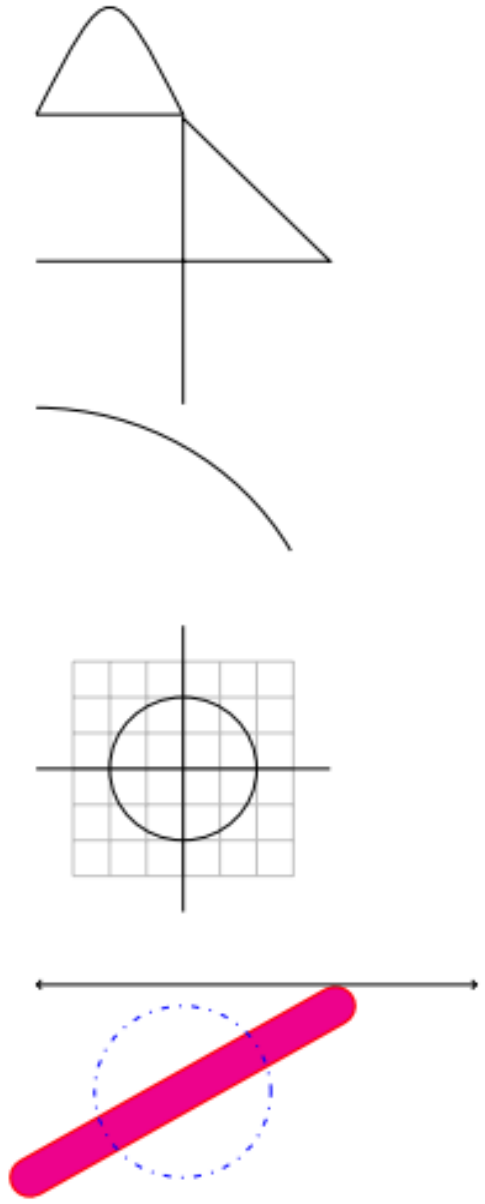
```latex
\documentclass[12pt]{article}

\usepackage{tikz}

\begin{document}

\vskip25pt
\begin{tikzpicture}
\draw (0,0)--(15mm,0) ;
\end{tikzpicture}

\vskip25pt
\begin{tikzpicture}
\draw (0,0)--(1,0) ;
\draw (0,0)--(1,1) ;
\end{tikzpicture}

\vskip25pt
\begin{tikzpicture}
\draw (1,0)--(0,0)--(0,1) (0,0)--(1,1) ;
\end{tikzpicture}
```



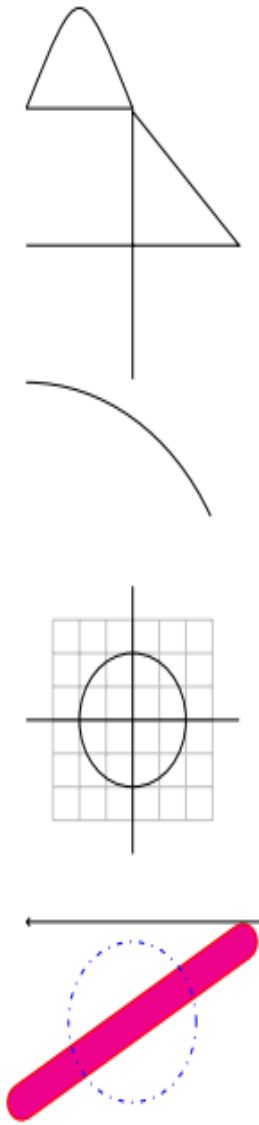
```
\vskip25pt
\begin{tikzpicture}
%\draw (0,0)--(1,0)--(1,1) (0,1)--(0,0) ;
\draw (0,0) rectangle (1,3);
\draw (3,0)--(4,0) -- (4,4)--cycle;
\end{tikzpicture}

\vskip25pt
\begin{tikzpicture}
\draw (0,0) circle [radius=1cm];
\end{tikzpicture}

\vskip25pt
\begin{tikzpicture}
\draw (0,0) circle [x radius=1.5cm, y radius= 1cm];
\end{tikzpicture}

\vskip25pt
\begin{tikzpicture}
\draw (1,0)--(0,0)--(0,1)(0,0) parabola (1,1);
\end{tikzpicture}
```



```latex
\documentclass[12pt]{article}

\usepackage{tikz}
\usetikzlibrary{angles,quotes}

\begin{document}

\begin{tikzpicture}
\draw (1,0).. controls (2,2).. (3,0)--(1,0);
\end{tikzpicture}

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

\begin{tikzpicture}
\draw (0,0) arc (30:90:4cm);
\end{tikzpicture}
```



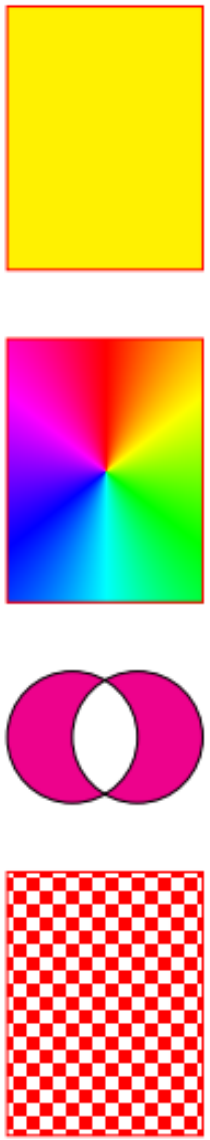
```
\vskip1cm
\begin{tikzpicture}
\draw[step=0.5cm, opacity=0.25] (-1.5,-1.5) grid (1.5,1.5);
\draw (-2,0)--(2,0);
\draw (0,-2)--(0,2);
\draw (0,0) circle [radius=1cm];
\end{tikzpicture}

\begin{tikzpicture}[transform canvas={xshift=2cm, yshift=-2cm},scale=1.2]
\draw[color=red,rotate=30,line width=1pt, double, double distance=5mm, double=magenta,
line cap=round] (-2,0)--(2,0);
\draw[color=blue,thick,loosely dash dot] (0,0) circle [radius=1cm];
\end{tikzpicture}

\begin{tikzpicture}
\draw[arrows= <->] (-3,0)--(3,0);
\end{tikzpicture}
```



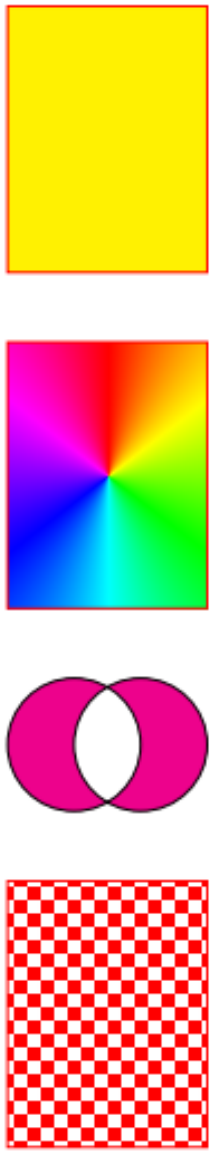
```
%Path actions:
%rotate=<angle>, xshift=<length>, yshift=<length>, scale=<factor>, xscale=<factor>,
yscale=<factor>
%
%Color:
%color = <color name>, opacity =<factor>

%line width= dim.
%
%Predefined line width:
%ultra thin = 0.1pt,
%very thin = 0.2pt,
%thin = 0.4pt (the default width),
%semithick = 0.6pt,
%thick = 0.8pt,
%very thick = 1.2pt,
%ultra thick = 1.6pt
%
```

```
%
%dash pattern= on dim. off dim.
%Predefined line pattern:
%solid, dashed, dotted, densely dotted, loosely dotted,
%loosely dash dot, dash dot dot, densely dash dot,
%loosely dash dot, double, double=color name,
%double distance= dim.
%
%Line end/join:
%line cap= < rect, round, butt >, arrows = < start arrow kind - end arrow kind >
```

```latex
\documentclass[12pt]{article}

\usepackage{tikz}
\usetikzlibrary{shadings,patterns}

\begin{document}

    \begin{tikzpicture}
    \fill[color=yellow] (0,0) rectangle (3,4);
    \draw[color=red] (0,0) rectangle (3,4);
    \end{tikzpicture}

    \vskip1cm
    \begin{tikzpicture}
    \shade[shading=color wheel] (0,0) rectangle (3,4);
    \draw[color=red] (0,0) rectangle (3,4);
    \end{tikzpicture}
```

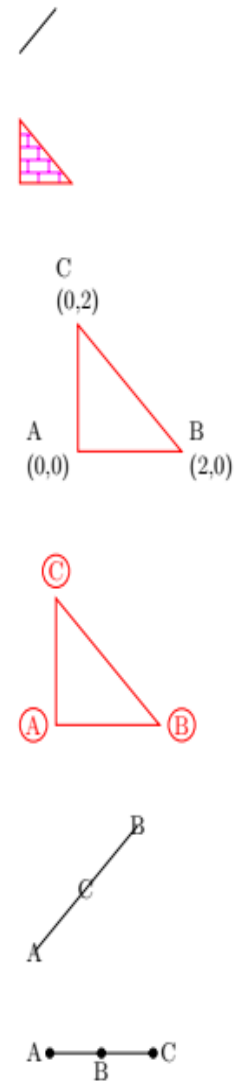


```
\vskip1cm
\begin{tikzpicture}
\fill[magenta,even odd rule] (0,0) circle[radius=1cm] (1,0) circle[radius=1cm]   ;
\draw (0,0) circle[radius=1cm] (1,0) circle[radius=1cm]   ;
\end{tikzpicture}

%Shadings:
%shading=<name>
%name: axis, radial, ball,
%
%shading angle= angle in degree,
%
%shading color:
%left color= color name, right color= color name,
%top color= color name, bottom color=color name, middle color=color name,
%inner color= color name, outer color= color name,
%
%\usetikzlibrary{shadings}
%upper left=color name, upper right=color name, lower left=color name,
%lower right=color name, shading=color wheel, color wheel black center, color wheel
white center,
```

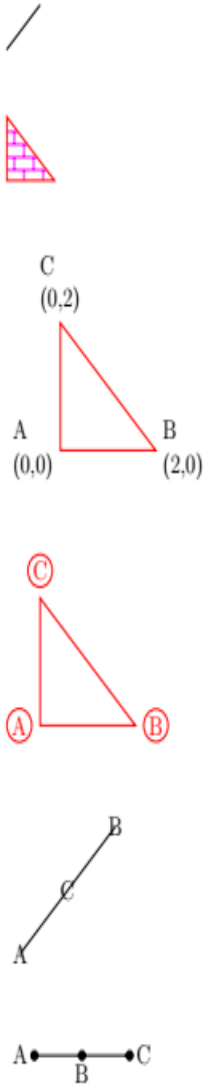


```
    \vskip1cm
    \begin{tikzpicture}
    \pattern[pattern=checkerboard, pattern color=red] (0,0) rectangle (3,4);
    \draw[color=red] (0,0) rectangle (3,4);
    \end{tikzpicture}

    %\usetikzlibrary{patterns}
    %pattern=<name>
    %name: dots, fivepointed stars, sixpointed stars, grid horizontal lines, vertical
lines, north east lines, north west lines, rosshatch, crosshatch dots, bricks,
checkerboard, checkerboard light gray,  horizontal lines light gray, horizontal lines
gray, horizontal lines dark gray, horizontal lines light blue, horizontal lines dark
blue, crosshatch dots gray, crosshatch dots light steel blue
    %
    %pattern color=<color name>

\end{document}
```

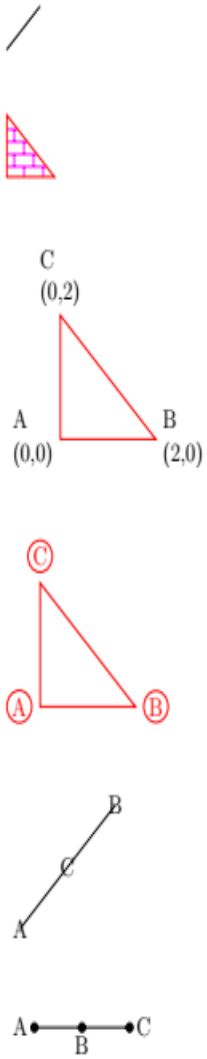
```latex
\documentclass[12pt]{article}

\usepackage{tikz}
\usetikzlibrary{shadings,patterns}

\begin{document}

    \begin{tikzpicture}
    \draw (0,0)--(45:1);
    \end{tikzpicture}

    \vskip1cm
    \begin{tikzpicture}
    %\fill[color=cyan] (0,0)--(1,0)--(0,1)--cycle;
    %\shade[top color=orange] (0,0)--(1,0)--(0,1)--cycle;
    \pattern[pattern=bricks,pattern color=magenta] (0,0)--(1,0)--(0,1)--cycle;
    \draw[color=red,thick] (0,0)--(1,0)--(0,1)--cycle;
    \end{tikzpicture}
```



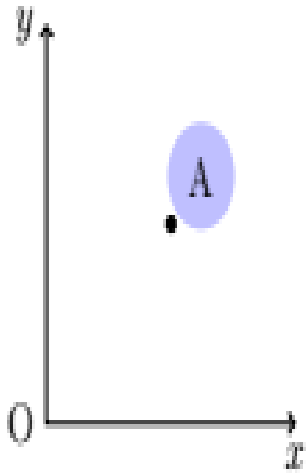
```
    \vskip1cm
    \begin{tikzpicture}
    \draw[color=red,thick] (0,0) node[anchor=east, align=left,text=black]{A\\ (0,0)}--
(2,0) node[right,align=left,text=black]{B\\ (2,0)}--(0,2)
node[above,align=left,text=black]{C \\ (0,2)}--cycle;
    \end{tikzpicture}

    %node[options]{<text>}
    %Node pos:
    %left or anchor=east, right or anchor=west, above or anchor=south, below or
anchor=north.
    %
    %node position on line or curve:
    %pos=<factor> (from 0-1)

    %align=<left/right/center>.
    %text=<color>
```

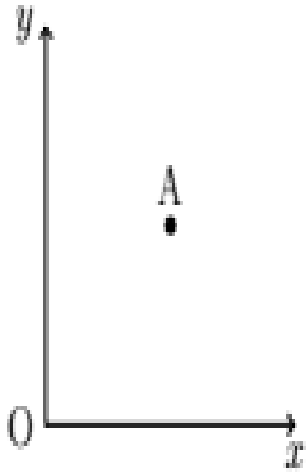


```
    \vskip1cm
    \begin{tikzpicture}
    \draw[color=red,thick] (0,0) node[draw,circle,left,inner sep=1pt,outer sep=5pt]{A}--
(2,0) node[draw,circle,right,outer sep=5pt,inner sep=1pt]{B}--(0,2)
node[draw,circle,above,outer sep=5pt,inner sep=1pt]{C}--cycle;
    \end{tikzpicture}

    %inner sep=<dimension>, outer sep=<dimension>, minimum size=<dimension>, shape
aspect=<aspect ratio>,

    \vskip1cm
    \begin{tikzpicture}
    \draw (0,0) node{A}-- (2,2) node{B} node[pos=0.5]{C}   ;
    \end{tikzpicture}

    \vskip1cm
    \begin{tikzpicture}
    \filldraw[fill=black] (0,0)node[left]{A} circle [radius=2pt]--(1,0)node[below]{B}
circle [radius=2pt]--(2,0)node[right]{C} circle [radius=2pt];
    \end{tikzpicture}
```

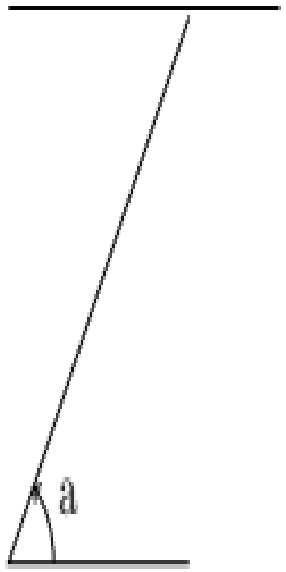


```latex
\documentclass[12pt]{article}

\usepackage{tikz}
\usetikzlibrary{shadings,patterns}

\begin{document}

    \begin{tikzpicture}
    \draw[<->,thick] (3,0)node[below]{$x$}--(0,0)node[left]{O}--(0,3)node[left]{$y$};
    \fill (1.5,1.5) circle [radius=2pt] node[above right=2pt, circle, fill=blue!25]{A};
    \end{tikzpicture}



    \begin{tikzpicture}
    \draw[<->,thick] (3,0)--(0,0)--(0,3);
    \fill (1.5,1.5) circle [radius=2pt];
    \node[below] at (3,0){$x$};
    \node[left] at (0,3){$y$};
    \node[left] at (0,0){O};
    \node[above] at (1.5,1.5){A};
    \end{tikzpicture}
```



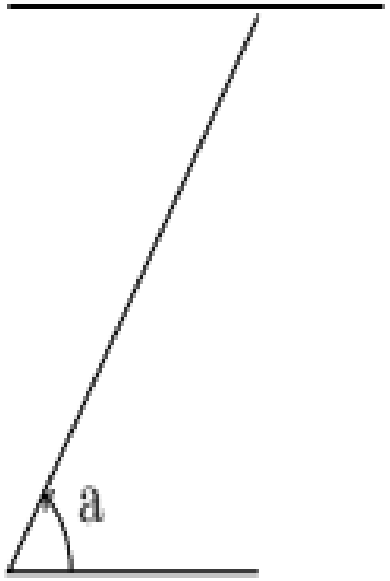


```
\begin{document}

\begin{tikzpicture}
\draw (0,0)node{};
\end{tikzpicture}

\begin{tikzpicture}
\node at (0,0) {};
\end{tikzpicture}



%node[options](label){text}
%\node[options](label) at (coordinate){text}

%node[options](label){} or coordinate[options](label)

%\node[options](label) at (coordinate){} or
%\coordinate[options](label) at (coordinate)
```



```
\begin{tikzpicture}
\coordinate (n1) at (2,0);
\coordinate (n2) at (5,0);

\draw (n1)--(n2) ;
\end{tikzpicture}
```

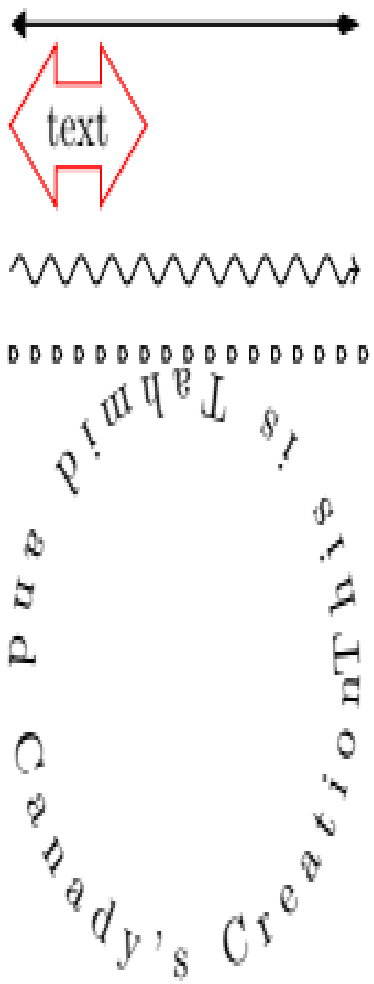
```
\begin{tikzpicture}
\draw (2,0)coordinate(A)--(0,0)coordinate(B)--(2,3)coordinate(C) pic[draw,->, "a", angle
eccentricity=1.5]{angle};
\end{tikzpicture}

%pic[options]{angle}

\end{document}
```



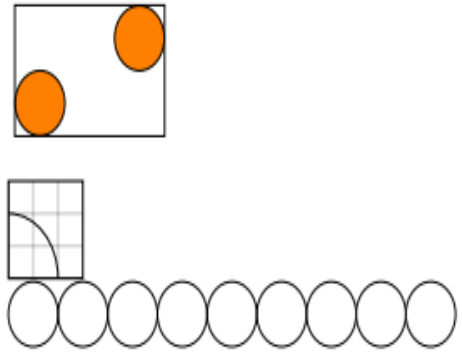
```
\usepackage{tikz}
\usetikzlibrary{shadings, patterns, angles, quotes, arrows.meta, shapes,
decorations.pathmorphing, decorations.shapes, decorations.text}


\begin{document}

\begin{tikzpicture}
\draw[ Triangle-Kite,thick] (0,0)--(4,0);
\end{tikzpicture}

%Arrows:
%1) from tikz: ->, <-, <->, >->, -to, -to reversed, -o, -|, -latex, -stealth, -stealth
reversed.
%
%2) from arrows.meta library: -Arc Barb, -Bar, -Bracket, -Hooks, -Stealth, -Parenthesis,
-Straight Barb, -Tee Barb, -Classical tikz Rightarrow, -Square, -Circle, -Implies, -
Rectangle, -Computer Modern Rightarrow, -Turned Square, -Diamond, -Ellipse, -Kite, -
Latex, -Triangle;
%Combination of two different arrows, e.g., Triangle-Circle.
```

```
\begin{tikzpicture}
\node[draw=red, double arrow] {text};
\end{tikzpicture}

%Geometric Shapes nodes:
%diamond, ellipse, trapezium, semicircle, star, regular polygon, isosceles triangle,
kite, dart, circular sector, cylinder.
%
%Symbol Shapes nodes:
%forbidden sign, magnifying glass, cloud, starburst, tape, signal.
%
%Arrow Shapes nodes:
%single arrow, double arrow, arrow box.
%
%Callout Shapes nodes:
%ellipse callout, rectangle callout, cloud callout.
%
%Miscellaneous Shapes nodes:
%cross out, strike out, rounded rectangle, chamfered rectangle.
```

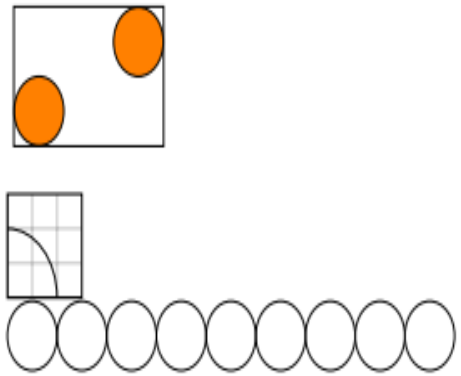
```
\begin{tikzpicture}
\draw[->,decorate, decoration=snake] (0,0)--(4,0);
\end{tikzpicture}

%Pathmorphing decorations:
%straight zigzag, saw, random steps, zigzag, bent, bumps, coil, snake,
%Shapes decorations:
%crosses, triangles, shape backgrounds, (shape backgrounds: dart, rectangle, cloud, star,
starburst, tape, kite, signal).
\begin{tikzpicture}
\draw[decorate, decoration={shape backgrounds, shape=signal}] (0,0)--(4,0);
\end{tikzpicture}

\begin{tikzpicture}
\draw[decorate, decoration={text along path, text={This is Tahmid and Canady's Creation},
text align={fit to path}}] (0,0)circle [radius=2cm];
\end{tikzpicture}

%Text decorations:
%%\draw[decorate,decoration={text along path,text={text}}] (1,1) circle (1);
```



```latex
\documentclass[12pt]{article}

\usepackage{tikz}
\usetikzlibrary{shadings, patterns, angles, quotes, arrows.meta, shapes,
decorations.pathmorphing, decorations.shapes, decorations.text}
\begin{document}

\begin{tikzpicture}
\filldraw[fill=orange, draw=black] (0,0) circle [radius=5mm];
\filldraw[fill=orange, draw=black] (2,1) circle [radius=5mm];

\node (n1) at (current bounding box.south west){};
\node (n2) at (current bounding box.north east){};

\draw (n1) rectangle (n2);
\end{tikzpicture}

\begin{tikzpicture}[remember picture, overlay]
\node[rotate=45, color=red, opacity=0.4, scale=10] (n2) at (current page.center)
{watermark};
\end{tikzpicture}
```



```
\begin{tikzpicture}
\clip[draw] (0,0) rectangle (1.5,1.5);
\draw[step=0.5cm, opacity=0.25] (-1.5,-1.5) grid (1.5,1.5);
\draw (-2,0)--(2,0);
\draw (0,-2)--(0,2);
\draw (0,0) circle [radius=1cm] node[left=2cm, above,red,rotate=90]{\textbf{See
part-03}};
\end{tikzpicture}

%\foreach <variable> in {<list of values>} <commands>

\begin{tikzpicture}
\foreach \x in {1,...,9}
\draw (\x,0) circle [radius=5mm];
\end{tikzpicture}



\end{document}
```



```latex
\documentclass[12pt]{article}

\usepackage{tikz}

\begin{document}

\begin{figure}
    \centering
\begin{tikzpicture}[baseline=1cm]
\useasboundingbox (-1mm,0) rectangle (2.1,2);
\filldraw[fill=olive] (0,0) rectangle (2,2);
\end{tikzpicture}
\caption{This is Tahmid and Canady's Presentation.}
\end{figure}



\begin{tikzpicture}
\node[draw,rectangle,fill=magenta!50,font=\bfseries, text=white] {Md. Tahmid Hasan};
\node[opacity=0.3] {\includegraphics[width=0.5\linewidth]{tahmid}};
\end{tikzpicture}
```

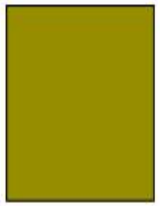


Figure 1: This is Tahmid and Canady's Presentation.

```
\begin{tikzpicture}
\draw[path picture={\node {\includegraphics[width=0.5\linewidth]{tahmid}}; } ] (0,0)
circle [radius=2.5cm];
\end{tikzpicture}

\begin{tikzpicture}
\draw[path picture={\node at (path picture bounding box.east)
{\includegraphics[width=0.5\linewidth]{tahmid}}; } ] (0,0) -- (4,0)--(4,4)--cycle;
\end{tikzpicture}



\end{document}
```

```
%\titleformat{command}[shape]{format}{label}{sep}{before-code}[after-code]

\titleformat{\chapter}[display]{\bfseries\Huge}{%
    \begin{tikzpicture}
    \node[draw, rectangle, fill=black, text=white] {\fontsize{100pt}{120pt}\selectfont
\thechapter };
    \end{tikzpicture}
}
{5mm}{}[{\color{red}\titlerule[2pt]}]

% command: \chapter, \section, \subsection, \subsubsection, \paragraph, \subparagraph
% shape: hang, block, display, runin, leftmargin, rightmargin, drop, wrap, frame
% format: format for whole title---> label + text
% label: label for sections
% sep: sep. (distance) between label and title body
% before-code: code for before chapter title text
% after-code: code for after chapter title text


\begin{document}
```

```
\begin{document}
\chapter{Introduction}

\begin{tikzpicture}
\node[draw=red, rectangle, ultra thick, fill=yellow!30, rounded corners, inner sep=20pt]
(box1) {
    \begin{minipage}{0.75\textwidth}
    In the bulk concentration of solute where $\phi|_{y\to \infty} = 0 \text{\ and\ } n|
_{y\to\infty} = n_\infty $, chemical potential $\mu^{\text{outer}}$ can be written as
    \begin{equation}
    \mu^{\text{outer}} = \mu^0 + k_BT\,\ln n_\infty.
    \end{equation}
    Equations can be equated at equilibrium: $\mu^{\text{inner}} = \mu^{\text{outer}}$,
i.e.
    \begin{equation}
    n(y) = n_\infty\,\exp\left[-\frac{\phi(y)}{k_BT}\right].
    \end{equation}
    \end{minipage}
 };
\node[ellipse, fill=red, text=white, font={\bfseries}, right=5mm] at (box1.north west)
{My fancy title};
\node[rectangle, fill=red, text=white] at (box1.east) {$\clubsuit$};

\end{tikzpicture}
```

1

Introduction

My fancy title

In the bulk concentration of solute where $\phi|_{y\to\infty} = 0$ and $n|_{y\to\infty} = n_\infty$, chemical potential μ^{outer} can be written as

$$\mu^{\text{outer}} = \mu^0 + k_BT \ln n_\infty. \tag{1.1}$$

Equations can be equated at equilibrium: $\mu^{\text{inner}} = \mu^{\text{outer}}$, i.e.

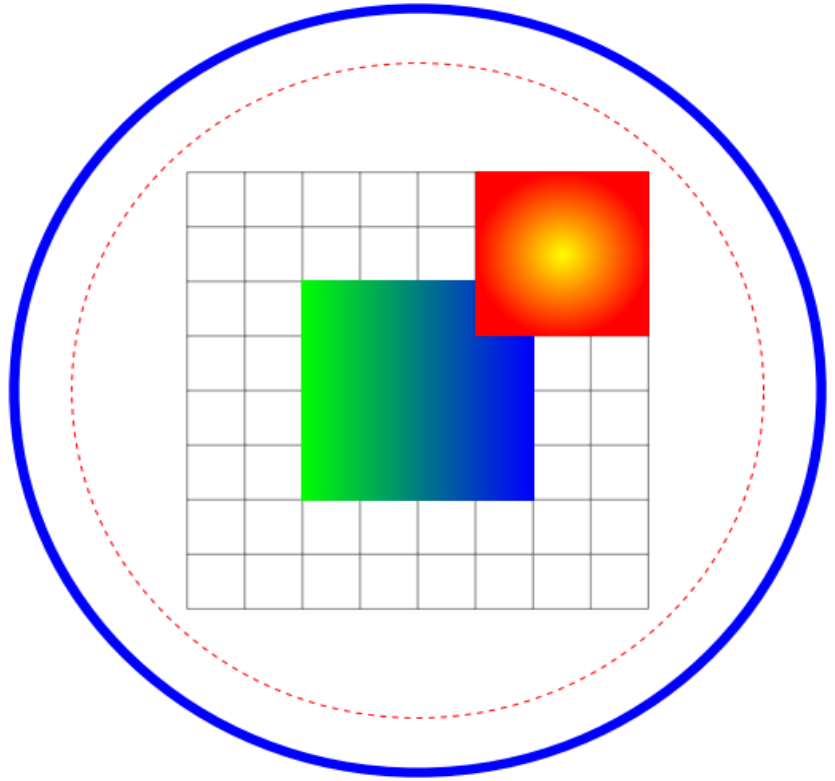
$$n(y) = n_\infty \exp\left[-\frac{\phi(y)}{k_BT}\right]. \tag{1.2}$$

BASIC SHAPE AND COLOURING

FR

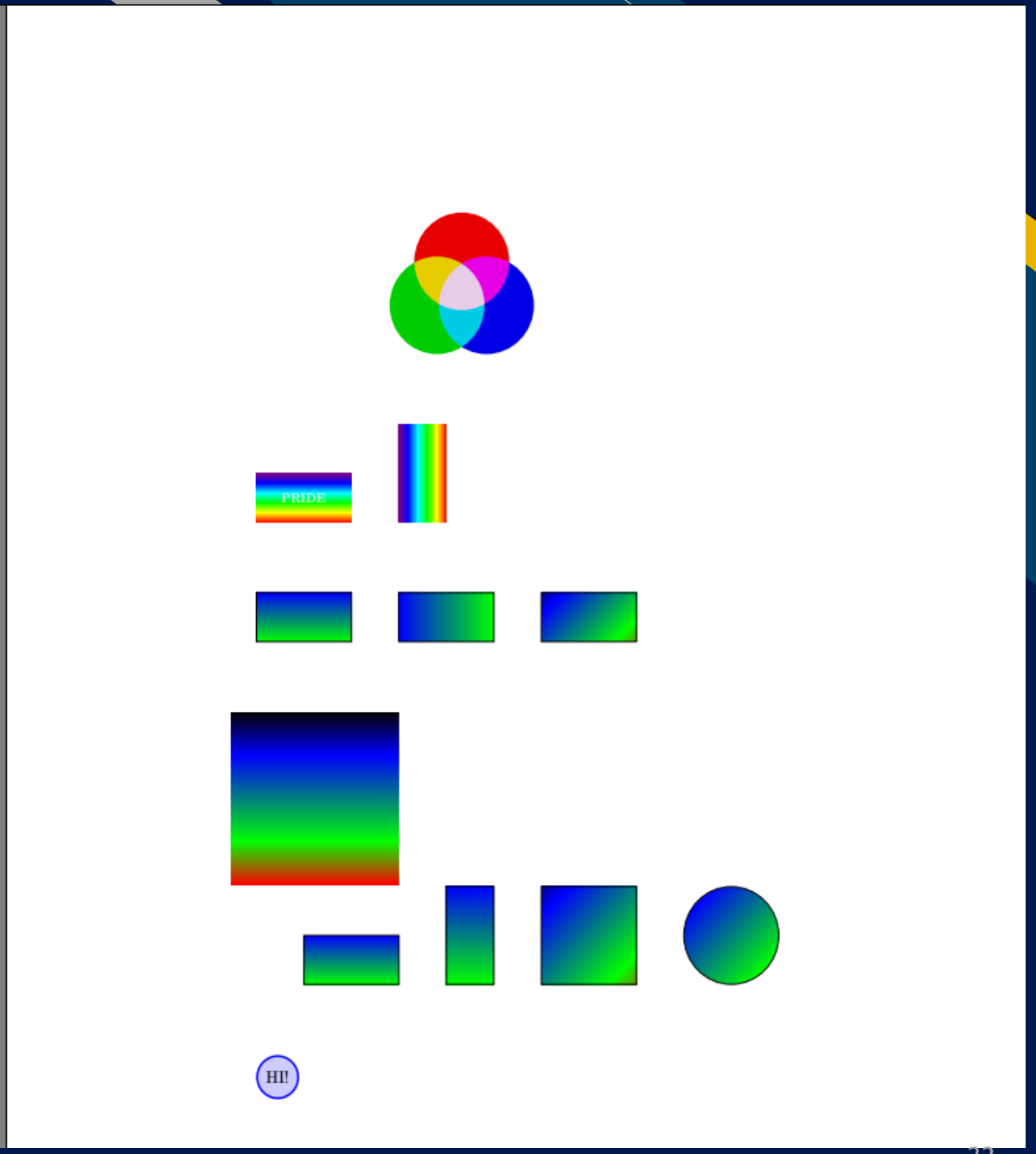
```
\documentclass{article} % say
\usepackage{tikz}
\begin{document}
Welcome to demo of TikZ and graph

\vskip60pt

\begin{tikzpicture}[line width=5pt]
\draw [step=1cm,gray,very thin] (-2,-2) grid (6,6);
\shade[left color=green,right color=blue] (0,0) rectangle (4,4);
\shade[inner color=yellow,outer color=red] (3,3) rectangle (6,6);
\draw[red,thick,dashed] (2,2) circle (6cm);
\draw[blue](2,2) circle (7cm);

\end{tikzpicture}


\end{document}
```

Welcome to demo of TikZ and graph



```
\pgfdeclareverticalshading{myshadingG}{100bp}
{color(0bp)=(red); color(25bp)=(green); color(75bp)=(blue); color(100bp)=(black)}
\begin{pgfpicture}
\pgfpathrectangle{\pgfpointorigin}{\pgfpoint{2cm}{1cm}}
\pgfshadepath{myshadingG}{0}
\pgfusepath{stroke}
\pgfpathrectangle{\pgfpoint{3cm}{0cm}}{\pgfpoint{2cm}{1cm}}
\pgfshadepath{myshadingG}{90}
\pgfusepath{stroke}
\pgfpathrectangle{\pgfpoint{6cm}{0cm}}{\pgfpoint{2cm}{1cm}}
\pgfshadepath{myshadingG}{45}
\pgfusepath{stroke}
\end{pgfpicture}
\vskip40pt
\pgfdeclareverticalshading{myshadingE}{100bp}
{color(0bp)=(red); color(25bp)=(green); color(75bp)=(blue); color(100bp)=(black)}
\pgfuseshading{myshadingE}
\hskip 1cm
\begin{pgfpicture}
\pgfpathrectangle{\pgfpointorigin}{\pgfpoint{2cm}{1cm}}
\pgfshadepath{myshadingE}{0}
\pgfusepath{stroke}
\pgfpathrectangle{\pgfpoint{3cm}{0cm}}{\pgfpoint{1cm}{2cm}}
\pgfshadepath{myshadingE}{0}
\pgfusepath{stroke}
\pgfpathrectangle{\pgfpoint{5cm}{0cm}}{\pgfpoint{2cm}{2cm}}
\pgfshadepath{myshadingE}{45}
\pgfusepath{stroke}
\pgfpathcircle{\pgfpoint{9cm}{1cm}}{1cm}
\pgfshadepath{myshadingE}{45}
\pgfusepath{stroke}
\end{pgfpicture}

\vskip40pt
\usepgfmodule {animations}
\tikz {
\pgfanimateattribute{opacity}{
whom = node, begin on = {click}, entry = {0s}{1}, entry = {2s}{0} }
\node (node) [fill = blue!20, draw = blue, very thick, circle] {HI!};
}


\end{document}
```

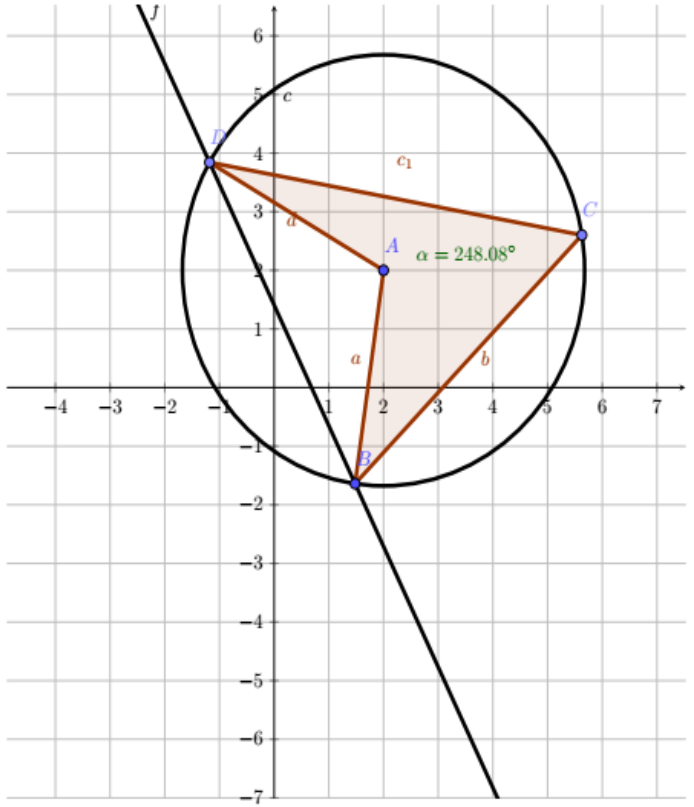
File	Type	Line	Message
colour0.1.tex	Warning	line 59	Your graphic driver pgfsys-pdftex.def does not support animations. This warning is given only once



GRAPHICS USING TIKZ

FR

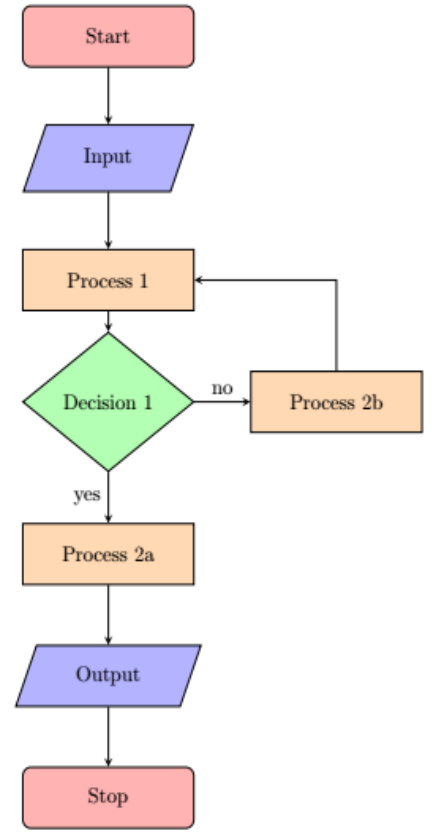
```
\usepackage{pgfplots}
\pgfplotsset{compat=1.15}
\usepackage{mathrsfs}
\usetikzlibrary{arrows}
\pagestyle{empty}
\newcommand{\degre}{\ensuremath{^\circ}}
\begin{document}
\definecolor{qqwuqq}{rgb}{0,0.39215686274509803,0}
\definecolor{zzttqq}{rgb}{0.6,0.2,0}
\definecolor{xdxdff}{rgb}{0.49019607843137253,0.49019607843137253,1}
\definecolor{ududff}{rgb}{0.30196078431372547,0.30196078431372547,1}
\begin{tikzpicture}[line cap=round,line join=round,>=triangle 45,x=1cm,y=1cm]
\begin{axis}[
x=1cm,y=1cm,
axis lines=middle,
ymajorgrids=true,
xmajorgrids=true,
xmin=-4.879999999999997,
xmax=7.519999999999995,
ymin=-7.000000000000003,
ymax=6.520000000000002,
xtick={-4,-3,...,7},
ytick={-7,-6,...,6},]
\clip(-4.88,-7) rectangle (7.52,6.52);
\fill[line width=2pt,color=zzttqq,fill=zzttqq,fill opacity=0.10000000149011612] (2,2) --
(1.48,-1.64) -- (5.62746652819137,2.6012375461090667) --
(-1.1825904399452467,3.841498870911715) -- cycle;
\draw [shift={(2,2)},line width=2pt,color=qqwuqq,fill=qqwuqq,fill
opacity=0.10000000149011612] (0,0) -- (-98.13010235415598:0.6) arc
(-98.13010235415598:149.94562391712563:0.6) -- cycle;
\draw [line width=2pt] (2,2) circle (3.676955262170047cm);
\draw [line width=2pt,color=zzttqq] (2,2)-- (1.48,-1.64);
\draw [line width=2pt,color=zzttqq] (1.48,-1.64)-- (5.62746652819137,2.6012375461090667);
\draw [line width=2pt,color=zzttqq] (5.62746652819137,2.6012375461090667)--
(-1.1825904399452467,3.841498870911715);
\draw [line width=2pt,color=zzttqq] (-1.1825904399452467,3.841498870911715)-- (2,2);
\draw [line width=2pt,domain=-4.88:7.52] plot(\x,
{(-3.7459700074391336--5.4814988709117145*\x)/-2.6625904399452467});
\begin{scriptsize}
\draw [fill=ududff] (2,2) circle (2.5pt);
\draw[color=ududff] (2.16,2.43) node {$A$};
\draw [fill=ududff] (1.48,-1.64) circle (2.5pt);
\draw[color=ududff] (1.64,-1.21) node {$B$};
\draw[color=black] (0.24,4.97) node {$c$};
```



CREATING FLOWCHARTS WITH TIKZ

FR

```
\documentclass{article} % say
\usepackage{tikz}
\usetikzlibrary{shapes.geometric, arrows}
\tikzstyle{startstop} = [rectangle, rounded corners, minimum width=3cm, minimum height=1cm,text centered, draw=black, fill=red!30]
\tikzstyle{io} = [trapezium, trapezium left angle=70, trapezium right angle=110, minimum width=3cm, minimum height=1cm, text centered, draw=black, fill=blue!30]
\tikzstyle{process} = [rectangle, minimum width=3cm, minimum height=1cm, text centered, draw=black, fill=orange!30]
\tikzstyle{decision} = [diamond, minimum width=3cm, minimum height=1cm, text centered, draw=black, fill=green!30]
\tikzstyle{arrow} = [thick,->,>=stealth]

\begin{document}
\hskip110pt
\begin{tikzpicture}[node distance=2cm]
\node (start) [startstop] {Start};
\node (in1) [io, below of=start] {Input};
\node (pro1) [process, below of=in1] {Process 1};
\node (dec1) [decision, below of=pro1] {Decision 1};
\node (pro2a) [process, below of=dec1, yshift=-0.5cm] {Process 2a};
\node (pro2b) [process, right of=dec1, xshift=2cm] {Process 2b};
\node (out1) [io, below of=pro2a] {Output};
\node (stop) [startstop, below of=out1] {Stop};
\draw [arrow] (start) -- (in1);
\draw [arrow] (in1) -- (pro1);
\draw [arrow] (pro1) -- (dec1);
\draw [arrow] (dec1) -- node[anchor=east] {yes} (pro2a);
\draw [arrow] (dec1) -- node[anchor=south] {no} (pro2b);
\draw [arrow] (pro2b) |- (pro1);
\draw [arrow] (pro2a) -- (out1);
\draw [arrow] (out1) -- (stop);

\end{tikzpicture}


\end{document}
```

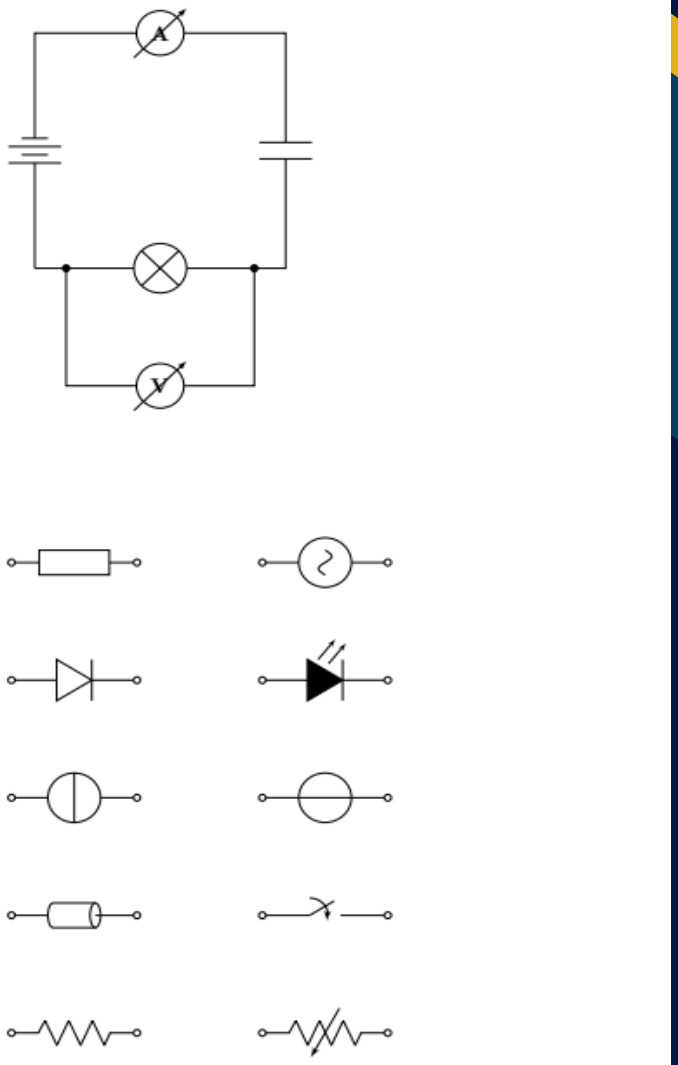


CIRCUIT DIAGRAMS USING CIRCUITIKZ

FR

```
\documentclass{article}
%\usepackage{tikz}
\usepackage{circuitikz}

%Circuit Diagrams Using Circuitikz
\begin{document}
\begin{circuitikz} \draw
(0,0) to[battery] (0,4)
  to[ammeter] (4,4)
  to[C] (4,0) -- (3.5,0)
  to[lamp, *-*] (0.5,0) -- (0,0)
(0.5,0) -- (0.5,-2)
  to[voltmeter] (3.5,-2) -- (3.5,0)
;
\end{circuitikz}
%List of some Circuit
\vskip60pt
\begin{circuitikz}
\draw
(0,0) to[R, o-o] (2,0)
(4,0) to[vR, o-o] (6,0)
(0,2) to[transmission line, o-o] (2,2)
(4,2) to[closing switch, o-o] (6,2)
(0,4) to[european current source, o-o] (2,4)
(4,4) to[european voltage source, o-o] (6,4)
(0,6) to[empty diode, o-o] (2,6)
(4,6) to[full led, o-o] (6,6)
(0,8) to[generic, o-o] (2,8)
(4,8) to[sinusoidal voltage source, o-o] (6,8)
;
\end{circuitikz}


\end{document}
```

File | Type | Line | Message



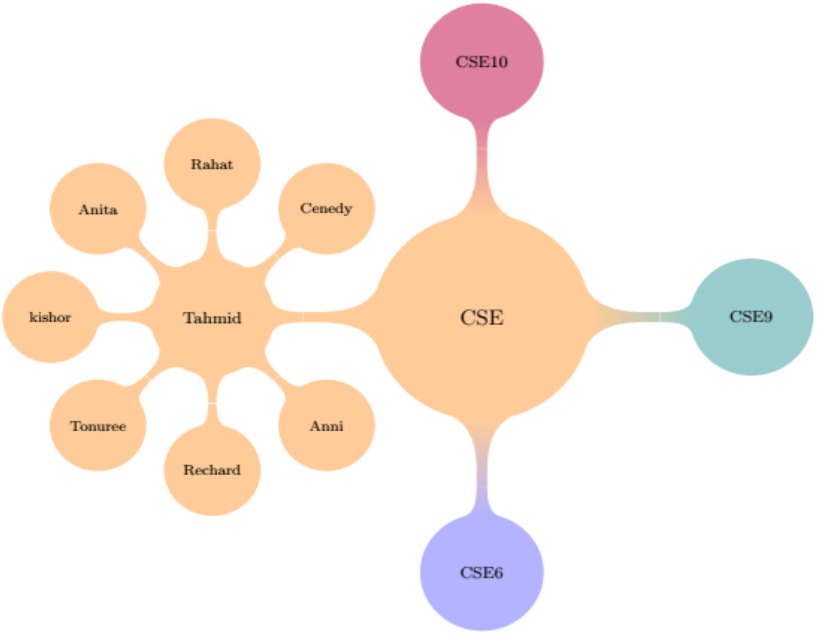
CREATING MIND MAPS WITH TIKZ

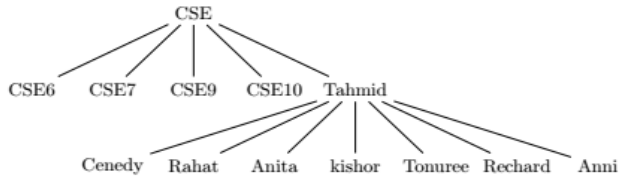
FR

mind.tex

```
\documentclass{article}
%Userpackage and library for mind map
\usepackage{tikz}
\usetikzlibrary{mindmap}
\pagestyle{empty}

%code of colored Mind map
\begin{document}
%\hskip55pt
\begin{tikzpicture}[mindmap, grow cyclic, every node/.style=concept, concept color=orange!
40,
    level 1/.append style={level distance=5cm,sibling angle=90},
    level 2/.append style={level distance=3cm,sibling angle=45},]
\node{CSE}
    child [concept color=yellow!30] { node {CSE7}}
    child [concept color=blue!30] { node {CSE6}}
    child [concept color=teal!40] { node {CSE9}}
    child [concept color=purple!50] { node {CSE10}}
child { node {Tahmid}
    child { node {Cenedy}}
    child { node {Rahat}}
    child { node {Anita}}
    child { node {kishor}}
    child { node {Tonuree}}
    child { node {Rechard}}
    child { node {Anni}}
}
;
\end{tikzpicture}

%code of normal Mind map
\vskip60pt
%\hskip110pt
\begin{tikzpicture}
\node{CSE}
    child  { node {CSE6}}
    child  { node {CSE7}}
    child  { node {CSE9}}
    child  { node {CSE10}}
child { node {Tahmid}
    child { node {Cenedy}}
    child { node {Rahat}}
    child { node {Anita}}
    child { node {kishor}}
    child { node {Tonuree}}
    child { node {Rechard}}
    child { node {Anni}}
}
```

File	Type	Line	Message
mind.tex	Badbox	line 28	Overfull \hbox (97.99129pt too wide) in paragraph at lines 28--29



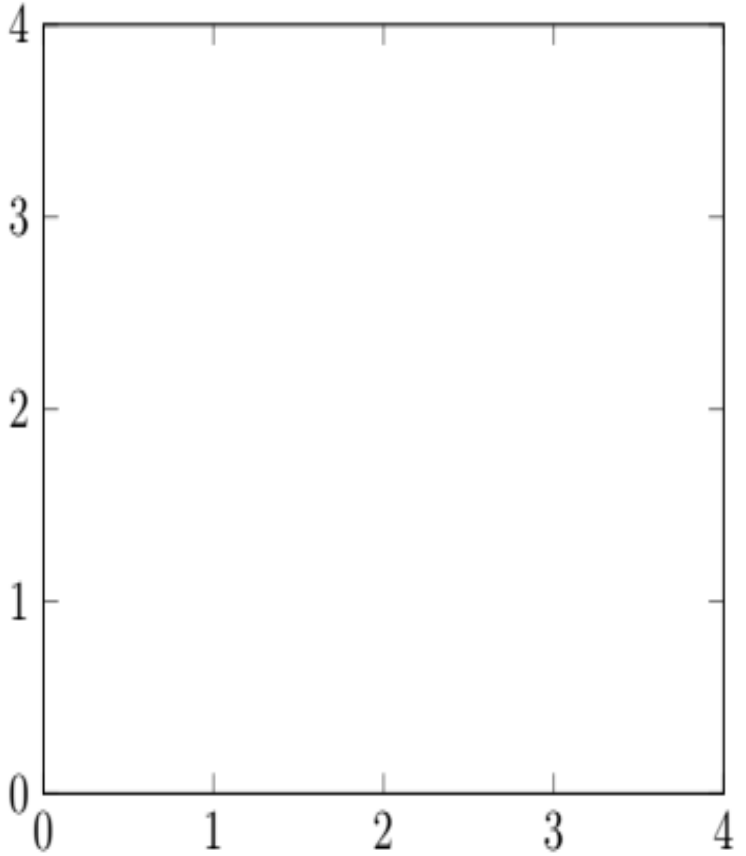


GRAPHING IN LATEX USING TIKZ

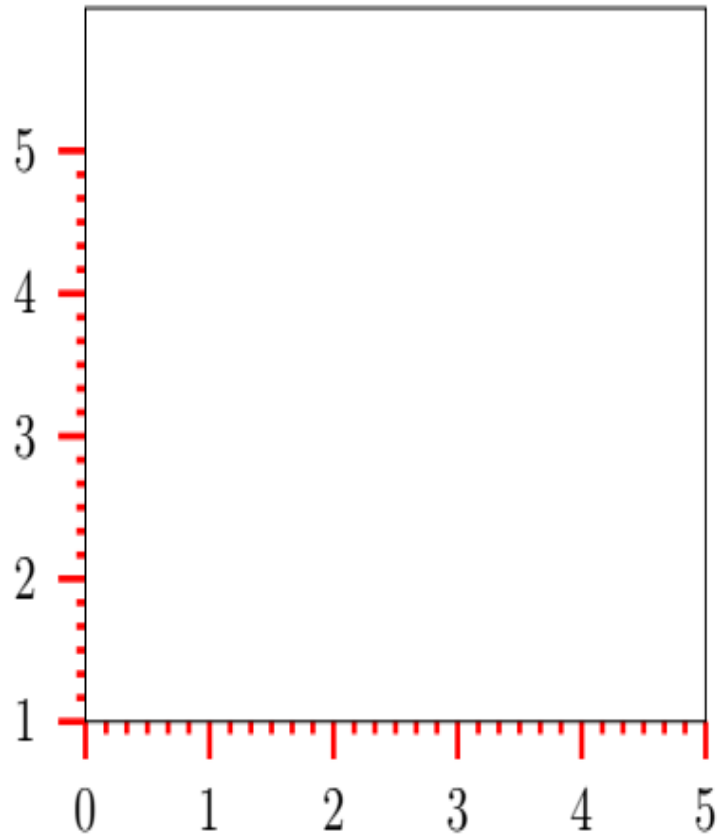
FR

```
\begin{tikzpicture}
\begin{axis}[axis options]
\addplot[plot options] <formula>;
\end{axis}
\end{tikzpicture}
```

```
\documentclass[12pt]{article}

%\usepackage{tikz}
\usepackage{pgfplots}

\begin{document}

\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=4, ymin=0, ymax=4]

\end{axis}
\end{tikzpicture}

\end{document}
```

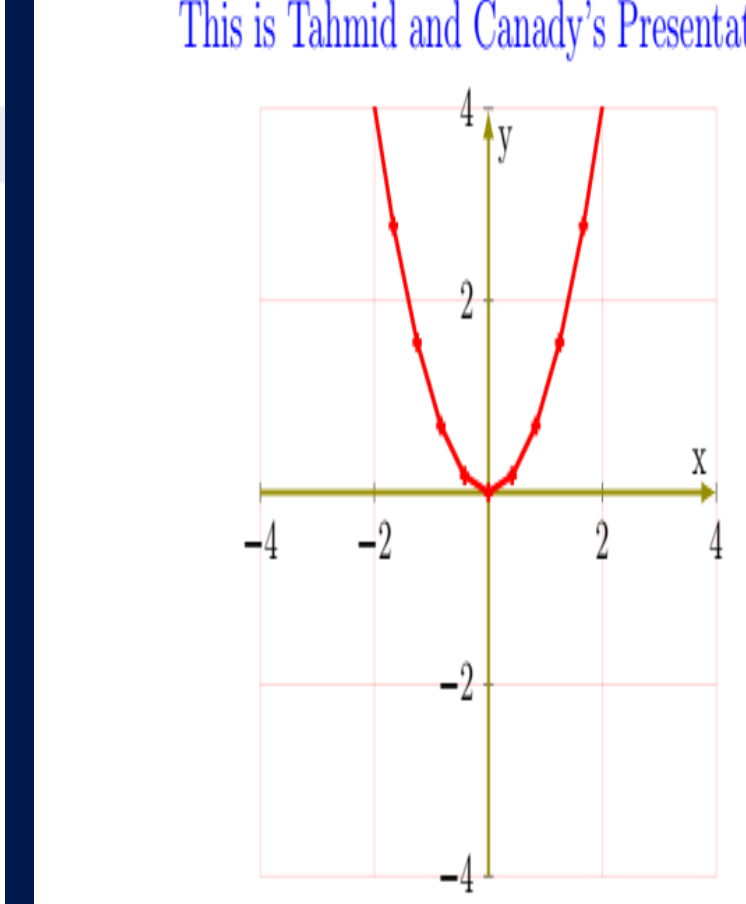


```
\documentclass[12pt]{article}

%\usepackage{tikz}
\usepackage{pgfplots}

\begin{document}

\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=5, ymin=1, ymax=6, tick align=outside,xtick distance=1.5, xtick
pos=left,ytick pos=left, minor tick num=5,major tick length=3mm, minor tick length=1mm,
xtick= {0,1,2,3,4,5},ytick= {1,2,3,4,5}, tick style={red, ultra thick}, xticklabel
style={yshift=-1mm, font=\large}, yticklabel style={xshift=-1mm, font=\large} ]

\end{axis}
\end{tikzpicture}

%Tick options:
%xtick align=inside|outside
%ytick align=inside|outside
%ztick align=inside|outside

%xtick distance=<value>; e.g., xtick distance=3
%ytick distance=<value>;
%ztick distance=<value>;
```



```
%xtick pos=left|right
%ytick pos=left|right
%ztick pos=left|right

%minor tick num={number}
%minor x tick num={number}
%minor y tick num={number}
%minor z tick num={number}

%major tick length=<dimension>
%minor tick length=<dimension>

%xtick = {<coordinate list>}; e.g., xtick= {1,2,3,4,5}, xtick=\empty
%ytick = {<coordinate list>}
%ztick = {<coordinate list>}

%tick style={<key-value-list>}
%xtick style={<key-value-list>}
%ytick style={<key-value-list>}
%ztick style={<key-value-list>}

%xticklabel style={<key-value-list>}
%yticklabel style={<key-value-list>}
%zticklabel style={<key-value-list>}
%minor tick style={<key-value-list>}
```

```
\documentclass[12pt]{article}

%\usepackage{tikz}
\usepackage{pgfplots}
\begin{document}

\begin{tikzpicture}
\begin{axis}[xmin=-4, xmax=4, ymin=-4, ymax=4, xlabel={x}, ylabel={y }, xlabel style= {font=
\bfseries\itshape }, ylabel style= {font=\bfseries\itshape, align=center}, axis x
line=middle, axis y line=middle, axis line style = {-latex, very thick, olive}, title={This
is Tahmid and Canady's Presentation}, title style={blue, font=\large}, grid=major, grid
style ={very thin, opacity=0.15, red} ]
\addplot[ultra thick, red, mark=+] expression  {x^2};
\end{axis}
\end{tikzpicture}
```



```
%Axis-options:
%1) Axis types:
%axis, semilogxaxis, semilogyaxis, loglogaxis
%
%2) Label options:
%xlabel={<text>}, ylabel= {<text>}, zlabel={<text>}
%
%3) Label styles:
%label style= {<key-value-list>},
%xlabel style= {<key-value-list>},
%ylabel style= {<key-value-list>},
%zlabel style= {<key-value-list>}
%
%---->key-value-list: text width=<dimension>, color name, xshift=<dimension>,
yshift=<dimension>, align=<left|center|right>, font=<command>
%
%4) Lines:
%axis lines  =<|left|middle|center|right|none>,
%axis x line=<|top|middle|center|bottom|none>,
%axis y line=<|left|middle|center|right|none>
%
```

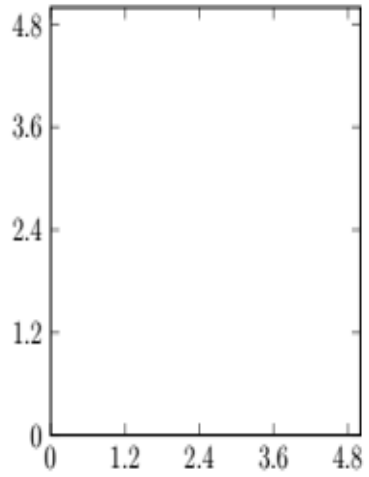
```
%5) Line styles:
%axis line style = {<key-value-list>},
%x axis line style = {<key-value-list>},
%y axis line style = {<key-value-list>},
%z axis line style = {<key-value-list>}
%
%axis line shift=<dimension>,
%axis x line shift=<dimension>,
%axis y line shift=<dimension>,
%axis z line shift=<dimension>
%
%6) Title, legend, grid options:
%title style={<key-value-list>},
%
%grid style={<key-value-list>},
%grid =major, xmajorgrids=true|false, ymajorgrids=true|false
%
%legend entries={<legend 1, legend 2, legend 3,...>}
%legend style={<key-value-list>},
```

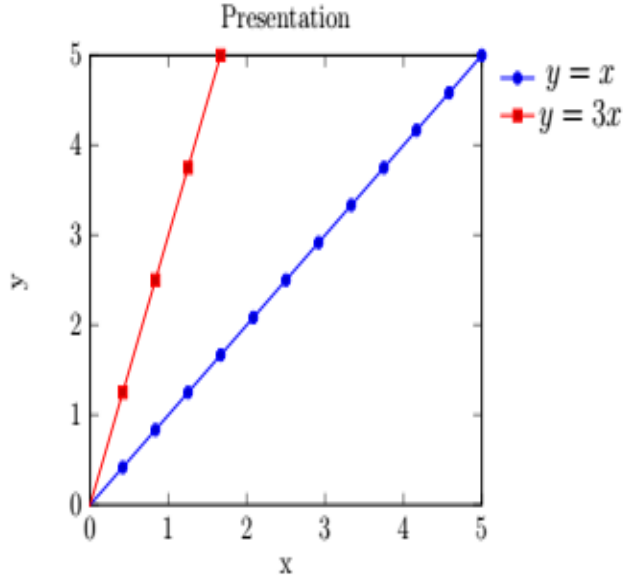
```
%styles for legend---> draw=none, shape=<shape name>, at={(point)}, legend columns=<num>,
legend cell align=<left|center|right>, legend pos={<north east, outer north east, south
east, north west, south west, ...>},

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

%Plot formula:
%\addplot expression  {}; (which samples from some mathematical expression)
%\addplot coordinates {}; (which uses the data from the given coordinates)
%\addplot table       {}; (loads data from tables)
%\addplot table       {}; (combination of expression and table, loads data from
%                          table and applies mathematical expressions)
%\addplot gnuplot     {}; (which uses gnuplot as "desktop calculator" and imports
%                          numerical data)
%\addplot graphics    {}; (which loads an image together with meta data and
%                          draws only the associated axis)
%
%Plot options:
%The axis- and the plot-options are largely the same: it is just that the plot-options
override corresponding attributes set in the axis-options.
%
```

```
%color name, thickness, dashed, solid, dotted, dashdotted, dashdotdotted, sample=<num>,
sample at = {x values separated by comma}, domain=m:n, draw, draw=none, mark=<symbol (e.g.,
ball, +, *, -, x,)>, no marks, only mark, mark size=<dimension>, mark options={<key-value-
list, e.g., color=red, rotate=45>},  mark repeat=n, nodes near coords, smooth, sharp plot,
%
%Graph size:
%width=<dimension>, height=<dimension>
%
%Available colors: blue, red, brown, green, cyan, magenta, yellow, black, gray, white,
darkgray, lightgray, lime, olive, orange, pink, purple, teal,
%violet.
```

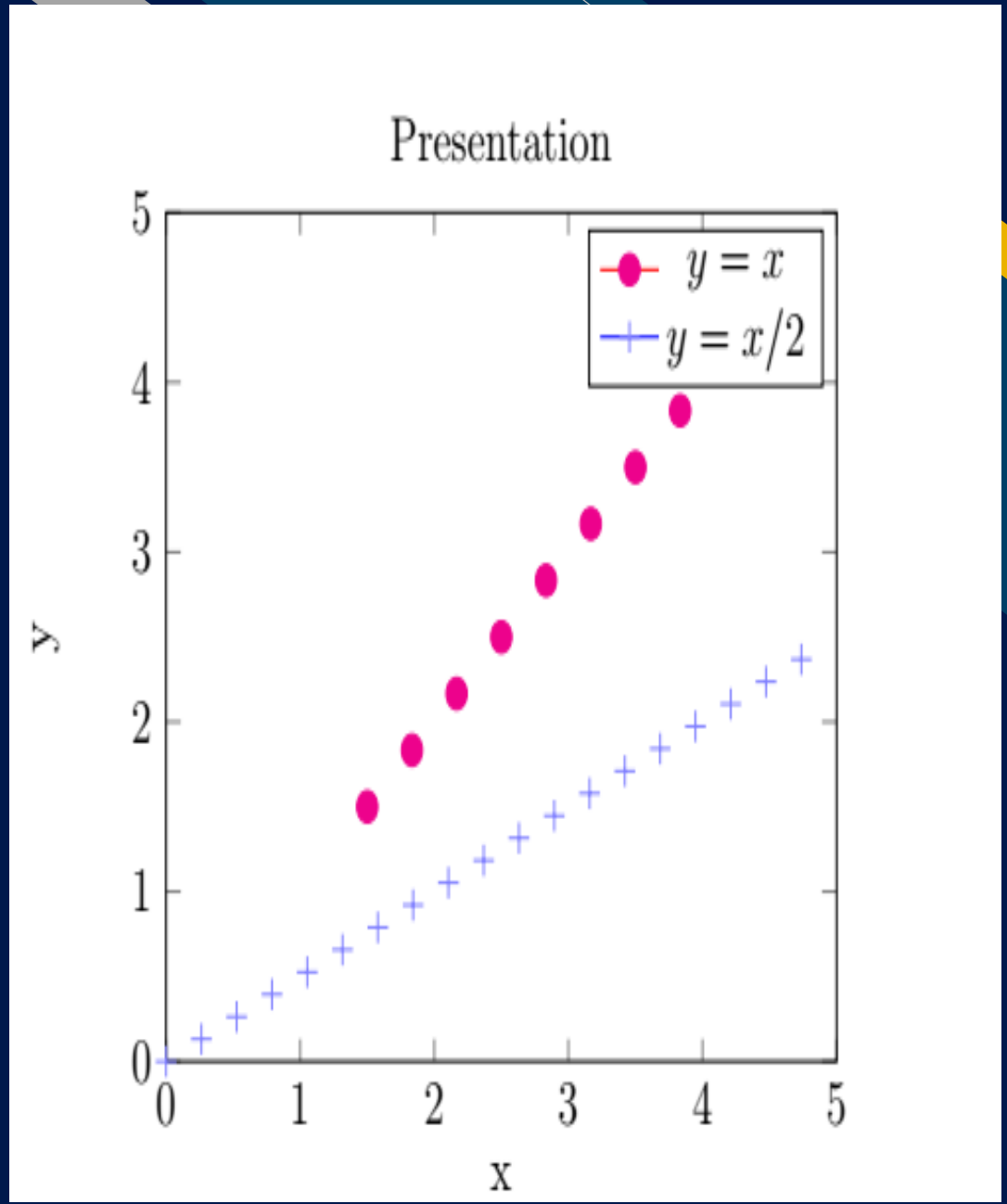
```
\documentclass[12pt]{article}

%\usepackage{tikz}
\usepackage{pgfplots}

\begin{document}

%1. axis range: [xmin, xmax, ymin, ymax]
%2. domain: sampling interval in the form of a:b
%3. Samples: samples=N, samples at={x1,x2,x3,...}, no. of samlples inserted into the
sampling interval

%Expressions:
%1. polynomial
%2. trigonometric
%3. exponential
%4. logarithmic
```

```
\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=5, ymin=0, ymax=5, width=7cm, height=7cm, xtick distance=1.2,
ytick distance=1.2]

\end{axis}
\end{tikzpicture}

\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=5, ymin=0, ymax=5, xlabel=x, ylabel=y, title=Presentation, legend
entries={$y=x$, $y=3x$}, legend style={font=\large, draw=none, legend pos=outer north east}
]
\addplot  {x};
\addplot  {3*x};
\end{axis}
\end{tikzpicture}
```

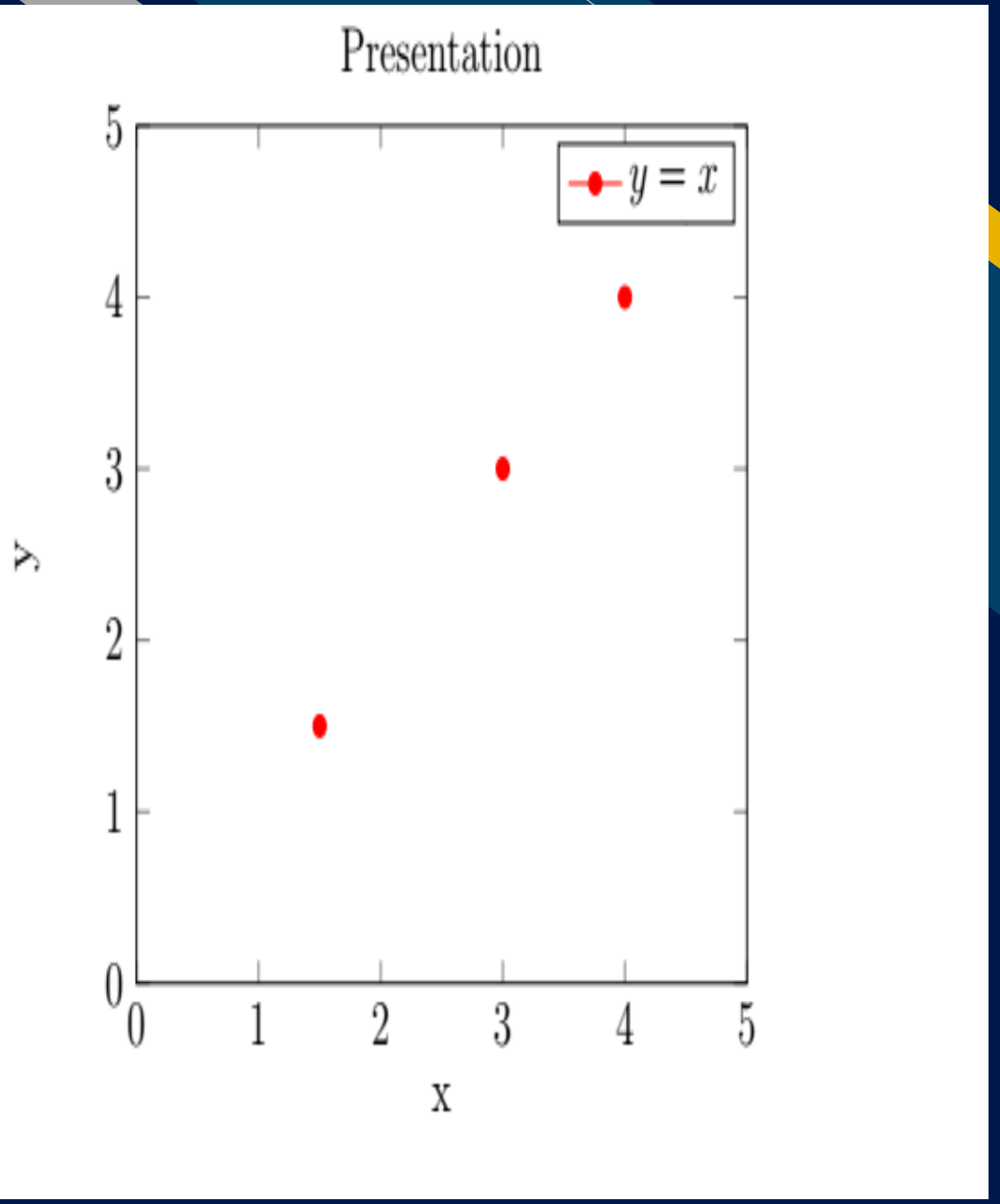




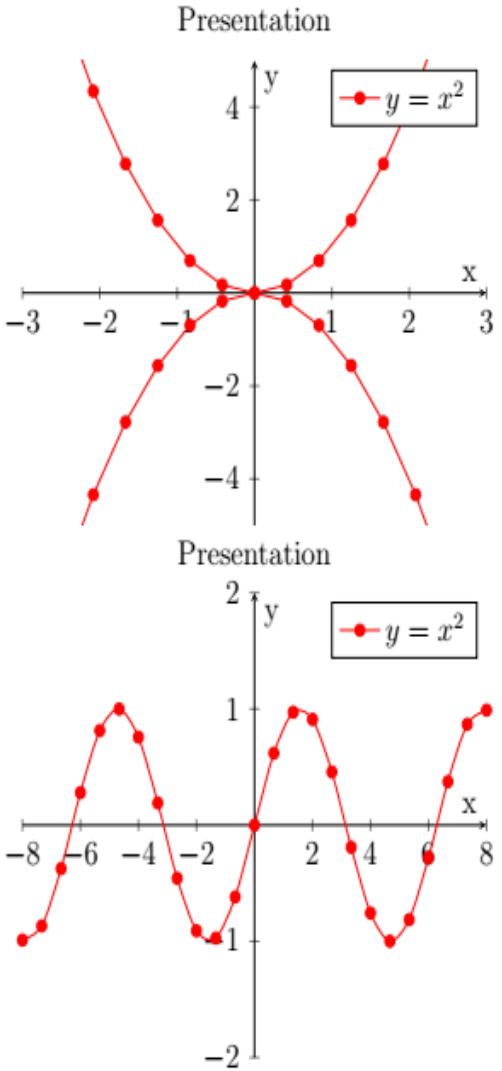
```
\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=5, ymin=0, ymax=5, xlabel=x, ylabel=y, title=Presentation, legend entries={$y=x$, $y=x/2$} ]
\addplot[draw=none, domain=1.5:4.5, mark=*, samples=10, red, mark options={magenta, mark size=3pt}]  {x};
\addplot[draw=none, domain=0:5, samples=20, mark=+, blue, mark options={blue!50, mark size=3pt}]  {x/2};
\end{axis}
\end{tikzpicture}

%Plot options:
%The axis- and the plot-options are largely the same: it is just that the plot-options override corresponding attributes set in the axis-options.
%
%color name, thickness, dashed, solid, dotted, dashdotted, dashdotdotted, samples=<num>, samples at = {x values separated by comma}, domain=m:n, draw, draw=none, mark=<symbol (e.g., ball, +,*, -, x,)>, no markers, only marks, mark size=<dimension>, mark options={<key-value-list, e.g., color=red, rotate=45>},  mark repeat=n, nodes near coords, smooth, sharp plot, variable=<name>
```



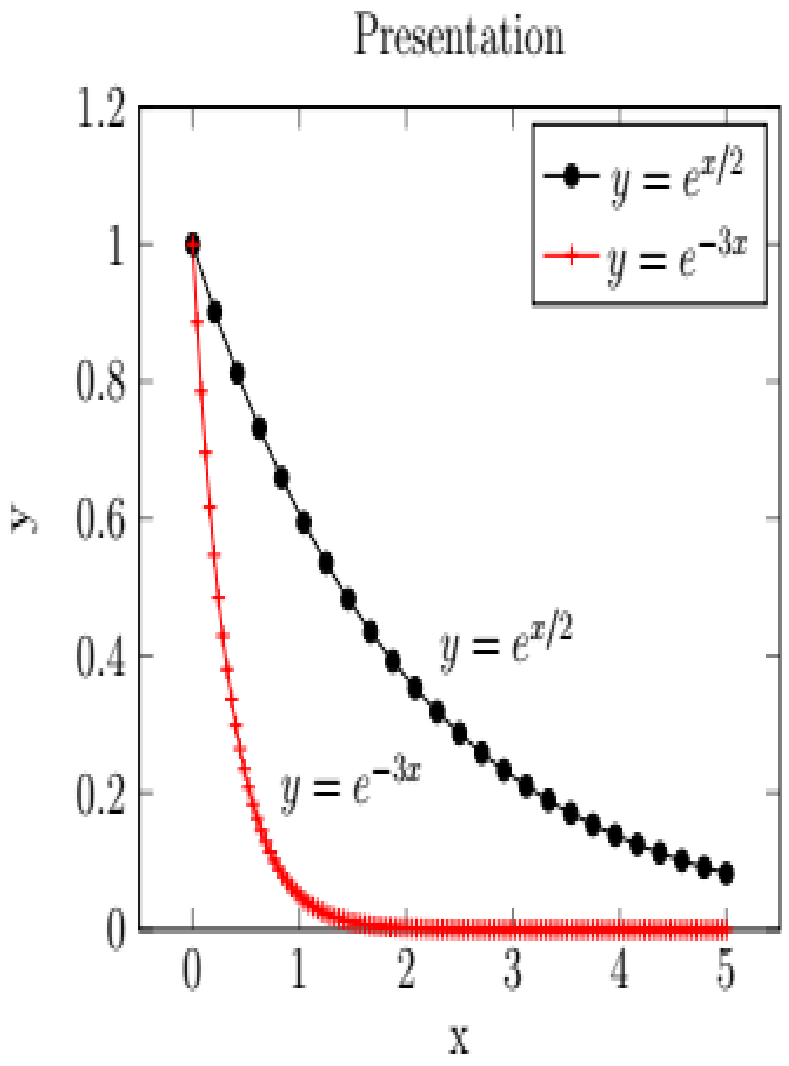
```
\begin{tikzpicture}
\begin{axis}[xmin=0, xmax=5, ymin=0, ymax=5, xlabel=x, ylabel=y, title=Presentation, legend
entries={$y=x$} ]
\addplot[draw=none, domain=1.5:4.5, mark=*, samples at ={1.5, 3, 4, 4.5}, red]  {x};
\end{axis}
\end{tikzpicture}
```



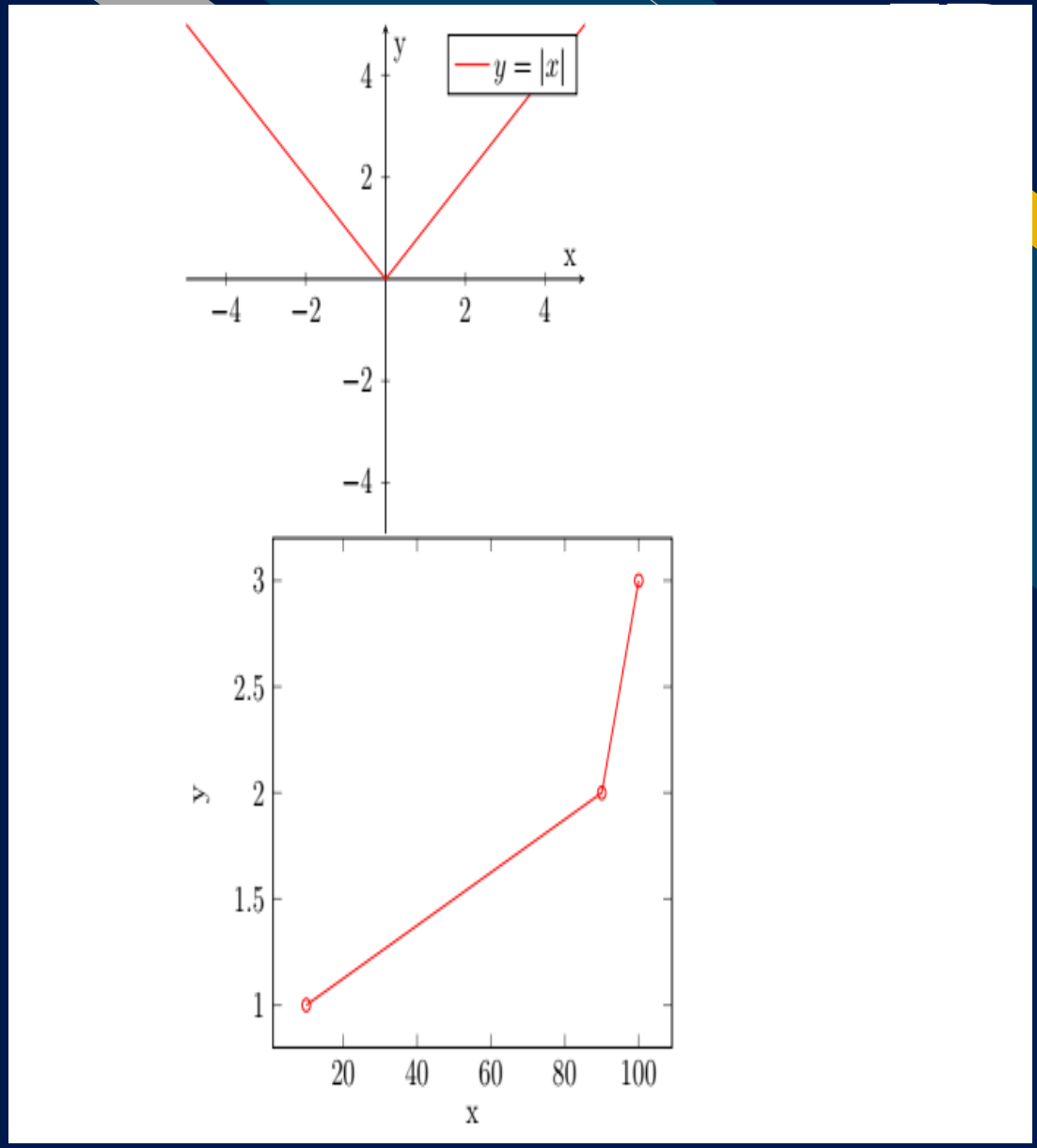
```
\begin{tikzpicture}
\begin{axis}[xmin=-3, xmax=3, ymin=-5, ymax=5, xlabel=x, ylabel=y, title=Presentation,
legend entries={$y=x^2$}, axis lines=center ]
\addplot[mark=*, red]  {x^2};
\addplot[mark=*, red]  {-x^2};
\end{axis}
\end{tikzpicture}

\begin{tikzpicture}
\begin{axis}[xmin=-8, xmax=8, ymin=-2, ymax=2, xlabel=x, ylabel=y, title=Presentation,
legend entries={$y=x^2$}, axis lines=center ]
\addplot[mark=*, red, domain=-8:8, smooth]  {sin(deg (x))};
\end{axis}
\end{tikzpicture}
```



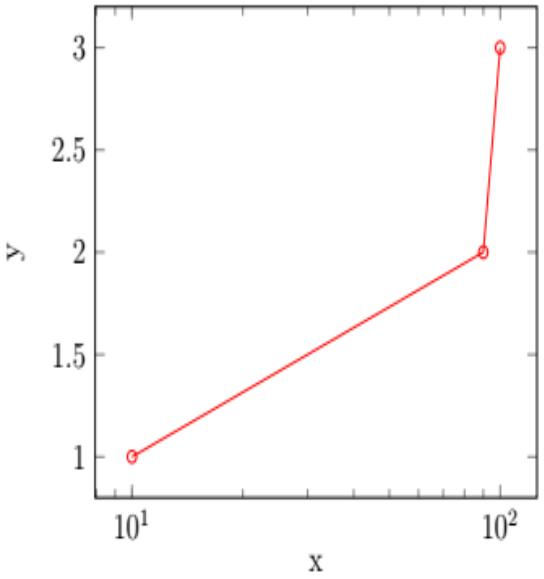
```
\begin{tikzpicture}
\begin{axis}[ymin=0, ymax=1.2, xlabel=x, ylabel=y, title=Presentation, legend
entries={$y=e^{x/2}$, $y= e^{-3x}$}]
\addplot[mark=*, domain=0:5]  {exp(-x/2)};
\addplot+[mark=+, domain=0:5, samples=125]  {exp(-3*x)};
\node[above=2cm, right=2.5cm] {$y=e^{x/2}$};
\node[above=1cm, right=0.8cm] {$y= e^{-3x}$};
\end{axis}
\end{tikzpicture}



\end{document}
```

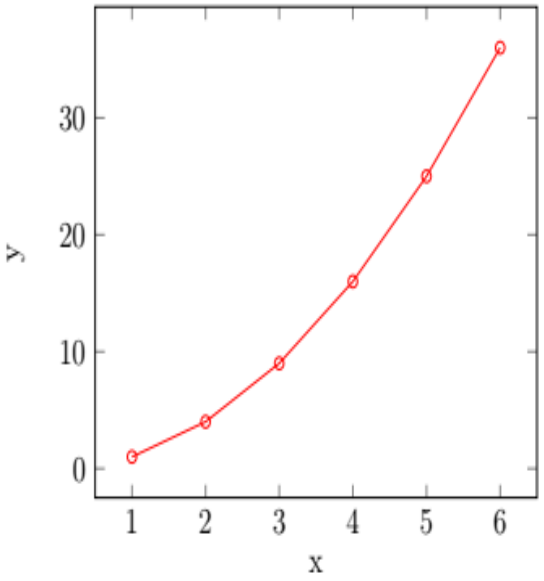


```
\begin{tikzpicture}
\begin{axis}[chstyle]
\addplot[red] {abs(x)};
\end{axis}
\end{tikzpicture}

\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y]
\addplot[red, mark=o] coordinates {(10,1) (90, 2) (100,3)};
\end{axis}
\end{tikzpicture}
```

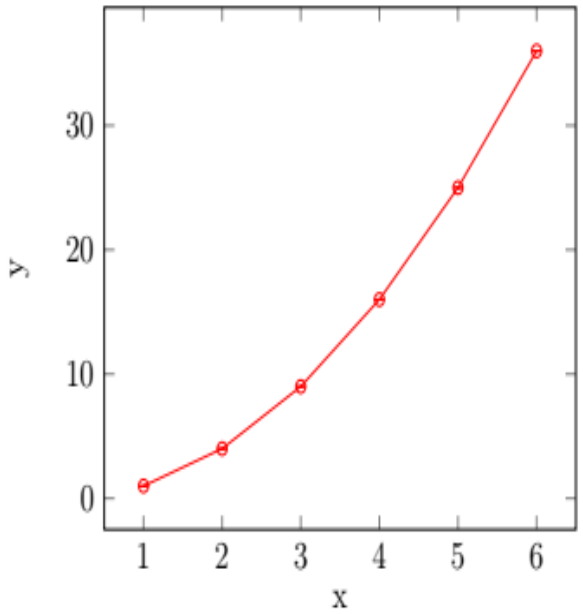


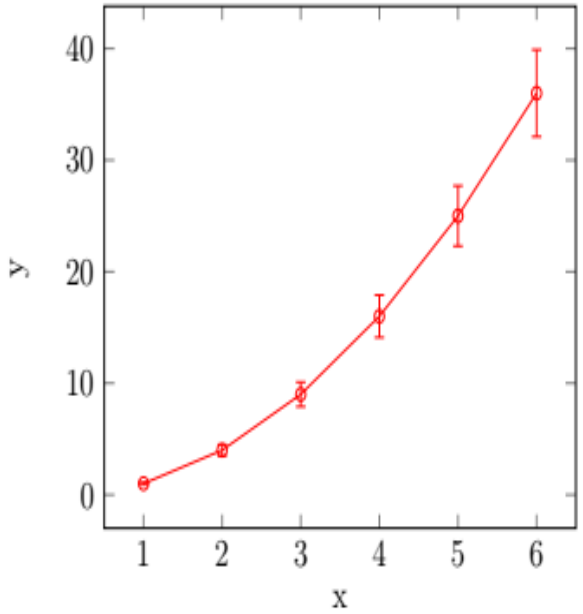
```
\begin{tikzpicture}
\begin{semilogxaxis}[xlabel=x, ylabel=y]
\addplot[red, mark=o] coordinates {(10,1) (90, 2) (100,3)};
\end{semilogxaxis}
\end{tikzpicture}

\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y]
\addplot[red, mark=o] table[x=xdata, y=ydata] {
xdata   ydata
1   1
2   4
3   9
4   16
5   25
6   36
};
\end{axis}
\end{tikzpicture}
```



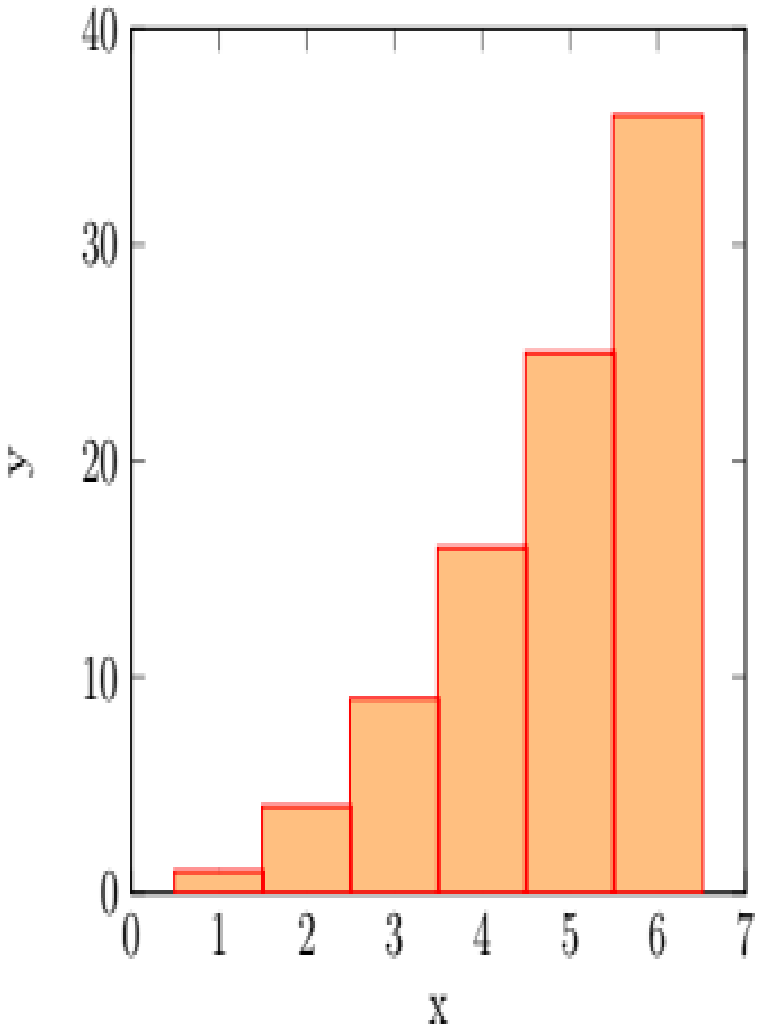


```
\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y]
\addplot[red, mark=o, error bars/.cd, y dir=both] table[x=xdata, y=ydata, y error=ybar] {
xdata   ydata   ybar
1   1   0.1
2   4   0.5
3   9   1.1
4   16  1.9
5   25  2.7
6   36  3.9

};
\end{axis}
\end{tikzpicture}


\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y]
\addplot[red, mark=o, error bars/.cd, y dir=both, y explicit] table[x=x, y=y, y error=ybar]
{tbdata.txt};
\end{axis}
\end{tikzpicture}
```

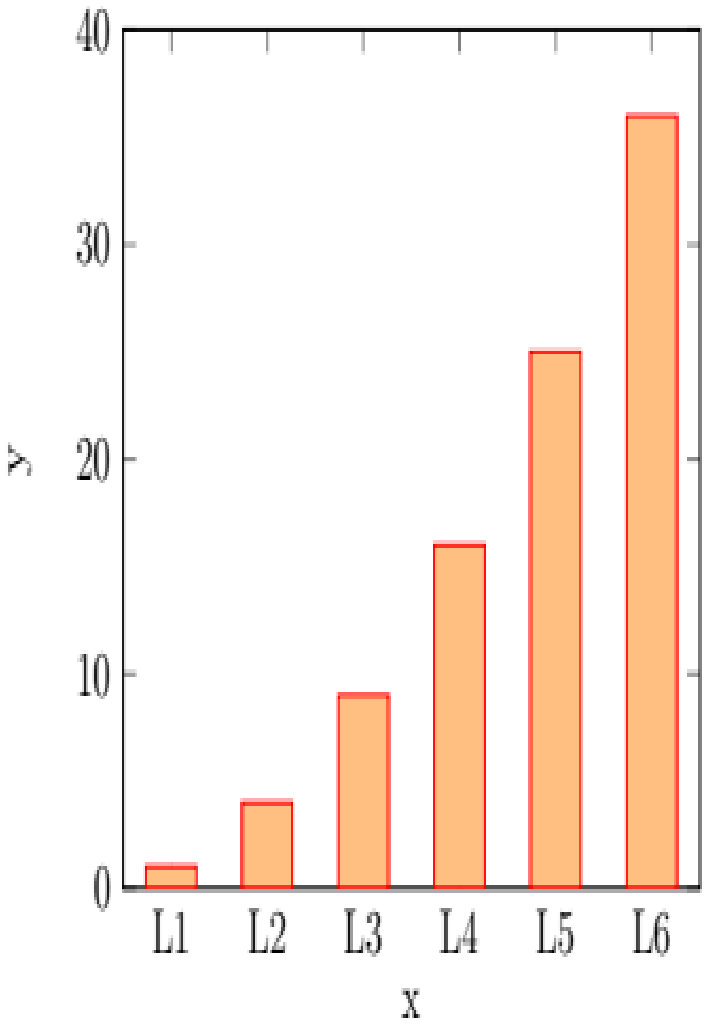




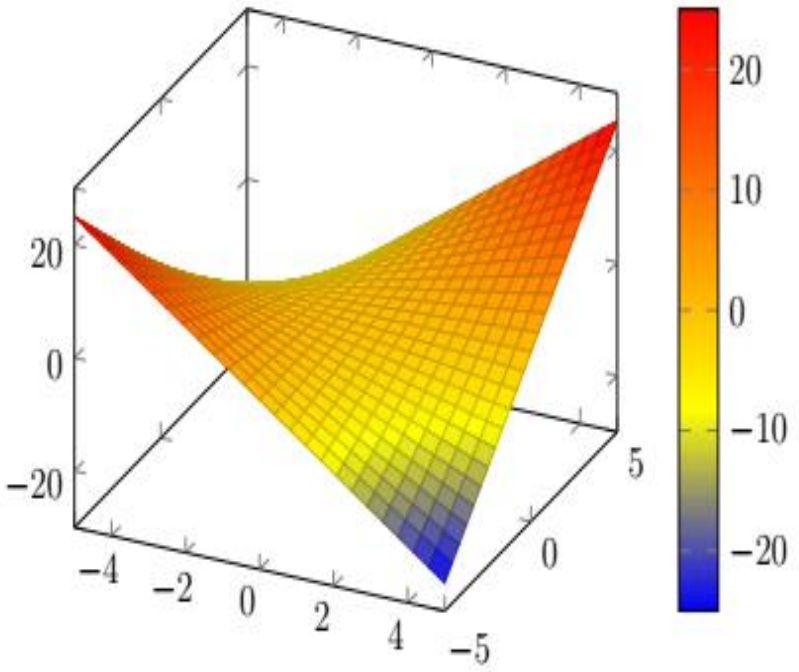
```
\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y, xmin=0, xmax=7, ymin=0, ymax=40]
\addplot[ybar, red, bar width=1cm, fill=orange!50] table[x=xdata, y=ydata] {
    xdata   ydata
    1   1
    2   4
    3   9
    4   16
    5   25
    6   36
};
\end{axis}
\end{tikzpicture}
```



```
\begin{tikzpicture}
\begin{axis}[xlabel=x, ylabel=y, ymin=0, ymax=40, symbolic x coords = {L1, L2, L3, L4, L5,
L6}]
\addplot[ybar, red, bar width=6mm, fill=orange!50] table[x=xdata, y=ydata] {
    xdata   ydata
    L1  1
    L2  4
    L3  9
    L4  16
    L5  25
    L6  36
};
\end{axis}
\end{tikzpicture}
```



```
\begin{tikzpicture}
\begin{axis}[colorbar]
\addplot3[surf] {x*y};
\end{axis}
\end{tikzpicture}

\end{document}
```



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Thank You!!!

REFERENCES

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