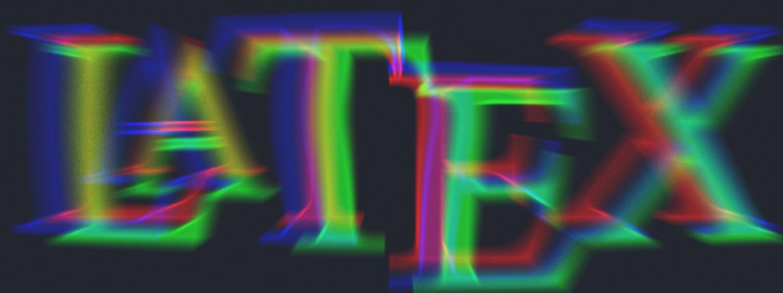


Latex in Examples




Thanks to me

Examples in this book is updated
every week.

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<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\dfrac{x^3}{45a ,\rightarrow^9-23b}\$} \end{equation*}</pre>	<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\dfrac{x^3}{45a ,\rightarrow^9-23b}\$} \end{equation*}</pre>	<pre>\begin{equation*}\label{eq1} \resizebox{.4\textwidth}{!}{ \$\dot{\rho}=\dfrac{x^3}{45a ^9-23b}\$} \end{equation*}</pre>
--	--	--

Figure 1: how CORRECT paste code from example

Chapter 1

Math Tips

1.1 Auto-resizing equation

$$\dot{\rho} = \frac{x^3}{45a^9 - 23b}$$

```
\begin{equation*}\label{eq1}  
\resizebox{.4\textwidth}{!}{ % change .4 to 0.5...  
$\dot{\rho}=\dfrac{x^3}{45a^9-23b}$}  
\end{equation*}
```

1.2 Form for simplest calculation

Fill with number

if it doesn't work try another PDF viewer

a:

b:

c:

$\Sigma =$

```
\documentclass{article}  
\usepackage{hyperref}  
\begin{document}  
\newcommand{\sss}[1]{this.getField("#1").value}  
\begin{Form}  
\noindent%  
Fill with number\\  
  
\TextField[name=a]{a:} \\  
  
\TextField[name=b]{b:} \\  
  
\TextField[name=c]{c:} \\  
\noindent%  
$\sum = \$ \backslash\TextField[name=AvgStat, calculate={  
event.value = (  
  \sss{a} +  
  \sss{b} +  
  \sss{c}) ;  
}, readonly, value=0]{}  
\end{Form}  
\end{document}
```

$$q_1 + \frac{1}{q_2 + \frac{1}{q_3 + \frac{1}{q_4 + \dots + \frac{1}{q_{k-1} + \dots}}}}$$

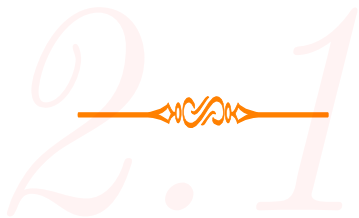
$$\frac{n_0}{n_1} = q_1 + \frac{1}{q_2 + \frac{1}{q_3 + \frac{1}{q_4 + \dots + \frac{1}{q_{k-1} + \frac{1}{q_k}}}}}$$

```
\documentclass{article}
\usepackage{amsmath}
\def\mywd{35pt}
\begin{document}
\[
 \frac{n_0}{n_1} = q_1 + \dfrac{\makebox[\mywd][l]{}}{}
      \rightarrow \$1\$)
    {\makebox[\mywd][l]{$q_2$} + \dfrac{\makebox[\mywd][l]{}}{}
      \rightarrow \$1\$)}
    {\makebox[\mywd][l]{$q_3$} + \dfrac{\makebox[\mywd][l]{}}{}
      \rightarrow \$1\$)}
    {\makebox[\mywd][l]{$q_4$} + 
     \raisebox{-6pt}{$$\ddots$}}
     \raisebox{-12pt}$+\dfrac{\makebox[\mywd][l]{$1$}\kern30pt$}}{}
    {q_{k-1} + \dfrac{1}{q_k}}
\end{document}
```

Chapter 2

Symbols

2.1 New section symbol



```
\usepackage[object=vectorian]{pgfornament}  
\usepackage{lipsum,tikz}  
\newcommand{\sectionlinetwo}[2]{%  
  \nointerlineskip \vspace{.5\baselineskip} \hspace{\fill}  
  {\color{#1} \resizebox{0.5\linewidth}{2ex}  
  {{{\begin{tikzpicture}  
    \node (C) at (0,0) {}; \node (D) at (9,0) {};  
    \path (C) to [ornament=#2] (D);  
  \end{tikzpicture}}}}}%  
  \hspace{\fill} \par \nointerlineskip  
  \vspace{.5\baselineskip}  
  %usage---> \sectionlinetwo{orange}{88}
```

Chapter 3

Code, listings, minted ...

3.1 Code listing using *minted* in beamer



```
Python Code Example
1 import glob
2
```

```
\documentclass{beamer}
\usepackage{amsmath}
\usepackage{tcolorbox}
\tcbuselibrary{minted,skins,breakable}
\newtcblisting{pythoncode}[2][]{
  listing engine=minted, breakable, colback=bg,
  colframe=black!70, listing only,
  minted style=colorful, minted language=python,
  minted options={numbersep=3mm,texcl=true,#1},
  left=5mm,enhanced,
  overlay={\begin{tcbclipinterior}\fill[black!25] (frame.south west)
rectangle ([xshift=5mm]frame.north west);\end{tcbclipinterior}},
#2,}
\begin{document}
\begin{frame}[fragile]
  \frametitle{Premature Optimization}
  \begin{pythoncode}[linenos=true,]{title=Python Code
    ↪ Example}
    import glob
  \end{pythoncode}
\end{frame}
\end{document}
```


3.2 "Zebra" style listing

```
/**
 * Prints Hello World.
 **/
#include <stdio.h>

int main(void) {
    printf("Hello World!");
    return 0;
}
```

```
\documentclass{article}
\usepackage[T1]{fontenc}
\usepackage{beramono}
\usepackage{listings}
\usepackage{xcolor}
\newcommand\realnumberstyle[1]{%
\makeatletter
\newcommand{\zebra}[3]{%
  {\realnumberstyle{#3}}%
  \begin{group}
  \lst@basicstyle
  \ifodd\value{lstnumber}%
    \color{#1}%
  \else
    \color{#2}%
  \fi
  \rlap{\hspace*{\lst@numbersep}%
    \color@block{\linewidth}{\ht\strutbox}{\dp\strutbox}%
  }%
  \end{group}
\makeatother
\begin{document}
\begin{lstlisting}[language=C,basicstyle=\ttfamily,
numberstyle=\zebra{green!35}{yellow!35},numbers=left]
/**
 * Prints Hello World.
 **/
#include <stdio.h>
int main(void) {
    printf("Hello World!");
    return 0;
}
\end{lstlisting}
\end{document}
```

3.3 Listing with russian language

```
print("English comment"); // English comment
print("Russian comment"); // Русский комментарий
```

```
\documentclass{article}
\usepackage[T2A]{fontenc}
\usepackage[utf8]{inputenc}
\usepackage[russian]{babel}
\usepackage{listings}
\usepackage{xcolor}

\begin{document}
\lstset{ keepspaces=true,
backgroundcolor=\color{blue},
showstringspaces=false,
language=C,
extendedchars=true,
framexrightmargin=0pt,
framexleftmargin=0pt,
framextopmargin=15pt,
framebottommargin=15pt,
frame=tb, framerule=0pt,
basicstyle=\color{yellow}\ttfamily\small}

\begin{lstlisting}% <<<<<<<<< add "/"
print("English comment"); // English comment
print("Russian comment"); // %here can be russian words
\end{lstlisting}% <<<<<<<<< add "/"

\end{document}
```

Chapter 4

Tables, boxes and so on

4.1 Nice tcolorbox

1	22
333	
Source	

```
\PassOptionsToPackage{svgnames}{xcolor}
\documentclass[twocolumn,a4paper]{article}
\usepackage{tcolorbox}
\tcbuselibrary{skins,breakable}
\usetikzlibrary{shadings,shadows}%preamble
\begin{tcolorbox}[colback=white!100,colframe=red!75!black,width
  ↳ =7cm,righttitle=0.5cm, subtitle style={boxrule=0.4pt,
  ↳ colback=yellow!50!red!25!white},title= \bf{1}\hfill \bf{22}]
  \begin{center}\bf{333}\end{center}
  \tcblower
  \href{https://tools.ietf.org/doc/texlive-doc/latex/tcolorbox
    ↳ /tcolorbox.pdf}{URL}
\end{tcolorbox}
```

4.2 Words highlighting

The quick brown fox jumps over
the lazy dog.

The quick brown fox
jumps over the lazy dog.

```
\documentclass{article}
\usepackage{tcolorbox}
\newtcbbox{\mybox}[1][red]{on line,
  arc=0pt,outer arc=0pt,colback=#1!10!white,colframe=#1!50!black,
  boxsep=0pt,left=1pt,right=1pt,top=2pt,bottom=2pt,
  boxrule=0pt,bottomrule=1pt,toprule=1pt}
\newtcbbox{\xmybox}[1][red]{on line,
  arc=7pt,colback=#1!10!white,colframe=#1!50!black,
  before upper={rule[-3pt]{0pt}{10pt}},boxrule=1pt,
  boxsep=0pt,left=6pt,right=6pt,top=2pt,bottom=2pt}
\begin{document}
The \mybox[green]{quick} brown \mybox{fox}...\par
The \xmybox[green]{quick} brown \xmybox{fox} ...
\end{document}
```

4.3 Unusual words highlighting

Here You can see
TYP more examples and learn
 something new.

```
\usepackage[many]{tcolorbox}
\newtcbbox{\mylib}{enhanced,nobeforeafter, tcbox raise base, boxrule=0.4pt,
  ↳ top=0mm, bottom=0mm,
  right=0mm, left=4mm, arc=1pt, boxsep=2pt, before upper={\vphantom{dlg
  ↳ }}, colframe=green!50!black, coltext=green!25!black, colback=green
  ↳ !10!white, overlay={\begin{tcbclipinterior} \fill[green!75!blue!50!
  ↳ white] (frame.south west) rectangle node[text=white,font=\sffamily\
  ↳ bfseries\tiny,rotate=90] {TYP} ([xshift=4mm]frame.north west);\
  ↳ end{tcbclipinterior}}}}
\begin{document}
\mylib{recieve}
\end{document}
```

4.4 Table with the desired length.

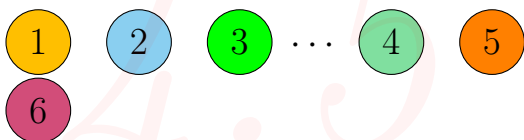
Table 1: Caption

Variant	res	Variaty of waters f_0 , res	C, res	L, res
5	1	2	1.26	5

*a command was also created to
 make a new cell view in the table*

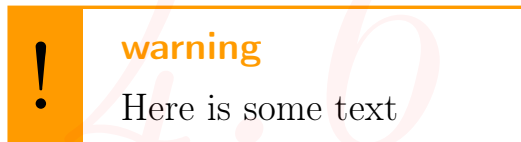
```
\usepackage{graphicx}
\usepackage{tabularx}
\newcolumntype{Y}{>{\centering\arraybackslash}X}
\begin{document}
\begin{table}[h!]
\begin{center}
\caption{\textbf{Caption}}
\begin{tabularx}{14cm}{|Y|Y|c|Y|Y|}
\hline
Variant & res & Variaty of waters  $f_0$ , res & C, res & L, res \\
\hline
5 & 1 & 2 & 1.26 & 5 \\
\hline
\end{tabularx}
\end{center}
\end{table}
```

4.5 Colored circles



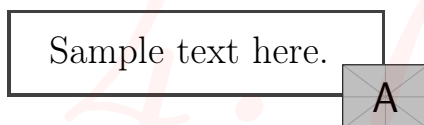
```
\usepackage{tikz}
\usepackage[framemethod=TikZ]{mdframed}
\usepackage{xcolor}
\usetikzlibrary{calc}
\makeatletter
\newlength{\mylength}
\xdef\CircleFactor{1.1}
\setlength\mylength{\dimexpr\fontdimen\scriptsize pt}
\newsavebox{\mybox}
\newcommand*\circled[2][draw=blue]{\savebox\mybox{\vbox{\vphantom{
  ↳ WL1/#1}}\setlength\mylength{\dimexpr\CircleFactor\dimexpr\ht\
  ↳ mybox+\dp\mybox\relax\relax}\tikzset{mystyle/.style={circle,#1,
  ↳ minimum height={\mylength}}}\tikz[baseline=(char.base)]
  ↳ node[mystyle] (char) {#2};}
\makeatother
\definecolor{amber}{rgb}{1.0, 0.75, 0.0}
\definecolor{babyblue}{rgb}{0.54, 0.81, 0.94}
usage --> \circled[fill=amber,draw=black]{1}
```

4.6 Warning banner



```
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
\usepackage[most]{tcolorbox}
\definecolor{orang}{RGB}{255,155,0}
\newtcolorbox[auto counter,number within=section]{caja}[1][]{
enhanced jigsaw,colback=white,colframe=orang,coltitle=orang,
fonttitle=\bfseries\sffamily,
sharp corners,
detach title,
lefrule=10mm,
% What you need %%%%%%%%%%%
underlay unbroken and first={\node[below,text=black,anchor=east]
at ([xshift=-5.5pt]interior.base west) {\Huge \textbf{!}};},
%%%%%%%%%%
breakable,pad at break=1mm,
#1,
code={\ifdefempty{\tcbtitletext}{\tcbset{before upper={\
    ↳ tcbtitle\par\medskip}}},}
\begin{document}
\begin{caja}[title=warning]
The vertical alignment settings
\end{caja}
\end{document}
```

4.7 Photo positioning



```
\documentclass{article}
\usepackage[most]{tcolorbox}
\usepackage{graphicx}
\begin{document}
\begin{tcolorbox}[enhanced,sharp corners,
width={5cm},
colback=white,
overlay={\node at (frame.south east) {\includegraphics[scale=0.1]{
    ↳ example-image-a}};}]
Sample text here.
\end{tcolorbox}
\end{document}
```

4.8 Absolutely centered cells (vertically and horison- tally)

all	in	cells
are	centered	vertically
and	horisontally	Σ

```

\documentclass{article}
\usepackage{float}
\usepackage{array, makecell}
\setcellgapes{5pt}

\begin{document}
\begin{table}[H]
\center
\makegapedcells
\begin{tabular}{|c|c|c|c|}
\hline
1&1&1&1 \\ \hline
1&1&1&1 \\ \hline
1&1&1&1 \\ \hline
\end{tabular}
\end{table}

\end{document}

```

4.9 Martix made of table

$$d_{n+1} \begin{vmatrix} a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ \dots\dots\dots \\ a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ a_{1,1} & \dots, a_{1,n} & 0 \\ \dots\dots\dots \\ a_{1,1} & \dots, a_{1,n} & 0 \end{vmatrix} = 0$$

```

\documentclass[a4paper,14pt]{extreport}
\begin{document}
\begin{table}[]
\begin{tabular}{|l| c r|l}
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
& \multicolumn{3}{|l|}{\dotfill} & & \\
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
& $d_{n+1}$ & & & $ = $ & $\pm 2ad_n = 0$ \\
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
& \multicolumn{3}{|l|}{\dotfill} & & \\
& $a_{1,1}$ & $ \dots, a_{1,n}$ & $ 0$ & & \\
\end{tabular}
\end{table}
\end{document}

```

4.10 Centering cells with NiceTabular

1	1	EVERY
1	1	CELL
1	1	CENTERED

```

\documentclass{article}
\usepackage[table]{xcolor}
\usepackage{nicematrix}
\NiceMatrixOptions{cell-space-top-limit=5pt,cell-space-bottom-
    ↪ limit=5pt}

\begin{document}
\begin{table}[htbp]
\centering
\begin{NiceTabular}{|c|c|c|}
\hline
\cellcolor{red}1&\cellcolor{green}1&1\\ \hline
\cellcolor{orange}1&\cellcolor{red!35}1&1\\ \hline
\cellcolor{green!35}1&\cellcolor{blue!45}1&1\\ \hline
\end{NiceTabular}
\end{table}
\end{document}

```

4.11 Centered cells in longtable

Enum	Example	Description
1	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.
2a	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.
2b	test	Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris rutrum sodales sapien. Fusce hendrerit sem vel lorem. Integer pellentesque massa vel augue. Integer elit tortor, feugiat quis, sagittis et, ornare non, lacus. Vestibulum posuere pellentesque eros. Quisque venenatis ipsum dictum nulla. Aliquam quis quam non metus eleifend interdum. Nam eget sapien ac mauris malesuada adipiscing. Etiam eleifend neque sed quam. Nulla facilisi. Proin a ligula. Sed id dui eu nibh egestas tincidunt. Suspendisse arcu.

```

\documentclass{article}
\usepackage[left=1.5cm,right=1.5cm,
top=1.5cm,bottom=2cm,bindingoffset=0cm]{geometry}
\usepackage{float}
\usepackage{array, makecell}
\usepackage{utf8}{inputenc}
\usepackage{lipsum}
\usepackage{booktabs}
\usepackage{multirow}
\usepackage{pdfscape}
\usepackage{longtable, array}

\begin{document}
\begin{landscape}
\begin{longtable}{@{} *{2}{m{.15\paperwidth}} *{1}{m{.40\paperwidth}} @{}}
\endfirsthead
\endhead
\toprule
\textbf{Enum} & \textbf{Example} & \textbf{Description} \\
\midrule
1 & test & \lipsum[50] \\
\midrule
2a & test & \lipsum[50] \\
2b & test & \lipsum[50] \\
\bottomrule
\end{longtable}
\end{landscape}
\end{document}

```

4.12 If table is not wide enough

	Item1	Item2	Item3
Group1	0.8	0.1	0.1
Group2	0.1	0.8	0.1
Group3	0.1	0.1	0.8
Group4	0.34	0.33	0.33

```
\documentclass{article}
\usepackage[left=1.5cm,right=1.5cm,
top=1.5cm,bottom=2cm,bindingoffset=0cm]{geometry}
\usepackage{graphicx}
\usepackage{booktabs}
\usepackage{tabularx}

\begin{document}

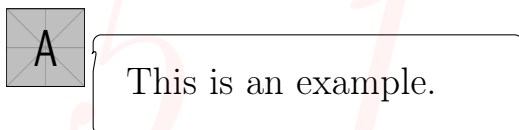
\begin{table}[!ht]
\caption{Vertical and lateral stresses of mortar.}
\vspace{0.5cm}
\begin{tabularx}{\textwidth}{X X X X}
& Item1 & Item2 & Item3 \\ \midrule
Group1 & 0.8 & 0.1 & 0.1 \\
Group2 & 0.1 & 0.8 & 0.1 \\
Group3 & 0.1 & 0.1 & 0.8 \\
Group4 & 0.34 & 0.33 & 0.33 \\ \bottomrule
\end{tabularx}
\label{c}
\end{table}

\end{document}
```

Chapter 5

Figures

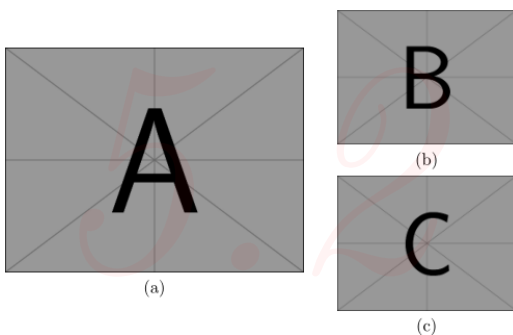
5.1 Comment to figure



```
\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{shapes.callouts}

\begin{document}
\begin{tikzpicture}
  \node [anchor=south west] at (0,0) (cartoon) {\includegraphics[width
    ↳=.15\textwidth,height=.15\textwidth]{example-image-a}};
  \node [anchor=north west,rectangle callout,draw=black,
    ↳callout absolute pointer=(cartoon.east),
    ↳rounded corners=3pt,text width=0.7\textwidth, inner sep=2ex] at (.19\
    ↳textwidth,.125\textwidth) {This is an example.};
\end{tikzpicture}
\end{document}
```

5.2 Positioning 1 | 2



```
\documentclass{article}
\usepackage{graphicx}
\usepackage{subfig}
\begin{document}
\begin{figure}[htp]
\centering
\begin{tabular}{@{}c@{}}
\subfloat{\includegraphics[width=0.5\linewidth]{example-image-a.png}}\\ (a)
\end{tabular}
\quad % some space
\begin{tabular}{@{}c@{}}
\subfloat{\includegraphics[width=0.3\linewidth]{example-image-b.png}}\\ (b)
\subfloat{\includegraphics[width=0.3\linewidth]{example-image-c.png}}\\ (c)
\end{tabular}
\caption{Caption.}
\end{figure}
\end{document}
```


5.3 Placing image anywhere You want



```
\usepackage{graphicx}
\usepackage{tikz}
\begin{document}
\begin{tikzpicture}[overlay, remember picture]
\node[anchor=north west,xshift=4cm,yshift=-11cm]
at (current page.north west)
{\includegraphics[width=5.5cm]{example-image-a.png}};
\end{tikzpicture}
\end{document}
```

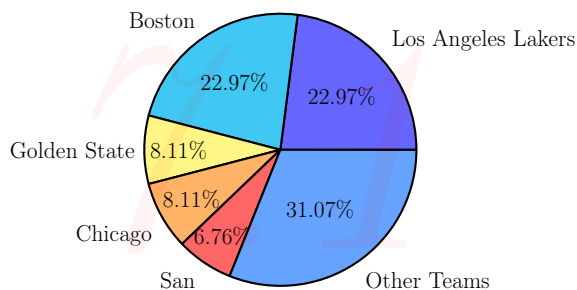
Chapter 6

Numbering

Chapter 7

Plots, tikz, pie charts ...

7.1 Simple pie chart



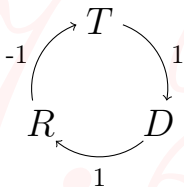
```
\documentclass[border=0.2cm]{standalone}
\usepackage{pgf-pie}

\begin{document}

\begin{tikzpicture}
\pie{22.97/Los Angeles Lakers,
22.97/Boston Celtics,
8.11/Golden State Warriors,
8.11/Chicago Bulls,
6.76/San Antonio Spurs,
31.07/Other Teams}
\end{tikzpicture}

\end{document}
```

7.2 Circled arrows with text



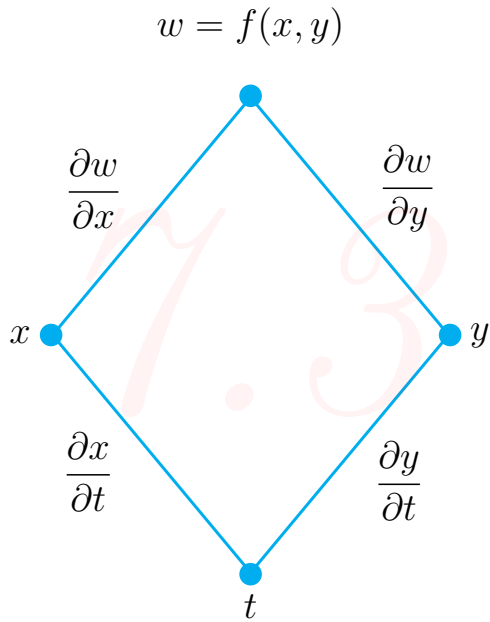
```
\documentclass{article}
\usepackage{tikz}

\begin{document}

\begin{tikzpicture}[->,scale=.7]
\node (i) at (90:1cm) {$T$};
\node (j) at (-30:1cm) {$D$};
\node (k) at (210:1cm) {$R$};
\draw (70:1cm) arc (70:-10:1cm) node[midway, right] {{\footnotesize 1}};
\draw (-50:1cm) arc (-50:-130:1cm) node[midway, below] {{\footnotesize 1}};
\draw (190:1cm) arc (190:110:1cm) node[midway, left] {{\footnotesize -1}};
\end{tikzpicture}

\end{document}
```

7.3 Diamond with text



```

\documentclass[a4paper,14pt]{extreport}
\usepackage[left=1.5cm,right=1.5cm,top=1.5cm,bottom=2cm,bindingoffset=0
  cm]{geometry}
\usepackage{amsmath}
\usepackage{tikz}
\usetikzlibrary{shapes.geometric}

\begin{document}
\begin{tikzpicture}
\node[diamond,font=\small,
line width=0.4mm,scale=0.7,
draw = cyan, minimum width = 7.5cm, %text = red,
minimum height = 9cm] (d) at (0,0) { };
\node [above=0.5cm] (a) at (d.90) {$w = f(x,y)$};
\node [above=0.5cm,right=0.1cm] (b) at (d.45) {$\dfrac{\partial w}{\partial y}$};
\node [above=0.5cm,left=0.1cm] (c) at (d.135) {$\dfrac{\partial w}{\partial x}$};
\node [left=0.1cm] (dd) at (d.180) {$x$};
\node [right=0.1cm] (e) at (d.0) {$y$};
\node [below=0.1cm] (f) at (d.270) {$t$};
\node [below=0.9cm,right=-0.3cm] (g) at (d.-30) {$\dfrac{\partial y}{\partial t}$};
\node [below=0.5cm,left=-0.1cm] (h) at (d.220) {$\dfrac{\partial x}{\partial t}$};
\node at (d.90) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.180) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.0) [cyan,circle,fill,inner sep=3pt]{};
\node at (d.270) [cyan,circle,fill,inner sep=3pt]{};
\end{tikzpicture}
\end{document}

```