Contents

Common Template

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1 Math Expressions

1.1 Display Mode

superscipts:

$$2x^3$$

$$2x^{2x+3}$$

subscripts:

$$2x_3$$

$$x_{123}$$

$$a_0, a_1, a_2, \ldots, a_{100}$$

Greek letters

$$\pi$$

$$\Pi$$

Trig functions

$$y = \sin x$$

$$y = \sin^{-1} \theta$$

$$y = \arcsin x$$

Log functions

$$y = \log_5 x$$

$$y = \ln x$$

Roots

$$\sqrt{2}$$

$$\sqrt[3]{27}$$

$$\sqrt{x^2 + y^2}$$

Fractions

$$\frac{2}{3}$$

Mathbb

$$\mathbb{R}$$

Parentheses with larger size:

$$2\left(\frac{1}{2}\right)$$

brackets

$$\left(\frac{1}{2}\right)$$

$$\left[\frac{1}{2}\right]$$

$$\left\{\frac{1}{2}\right\}$$

$$\left\langle\frac{1}{2}\right\rangle$$

$$\left|\frac{1}{2}\right|$$

$$\left.\frac{dy}{dx}\right|_{x=1}$$

$$\left(\frac{1}{1+\left(\frac{1}{2}\right)}\right)$$

2 Notations for Calculus

The function $f(x) = (x-3)^2 + \frac{1}{2}$ has domain $\mathrm{D}_f : (-\infty, \infty)$ and range $\mathrm{R}_f : \left[\frac{1}{2}, \infty\right)$

$\lim\limits_{x \to a^-} f(x)$

$\lim\limits_{x \to a} \frac{f(x)-f(a)}{x-a} = f'(a)$

$\int \sin x dx$

$\int sinx\, dx$

$\int\limits_a^b x^2\, dx = \left[\frac{x^3}{3}\right]_a^b$

$\int\limits_{t_0}^{t} e^{-\alpha(t-\tau)} f(\tau)\, d\tau$

$e^{-\alpha t} \int\limits_{t_0}^{t} e^{\alpha t} f(t)\, dt$

$\sum\limits_{n=1}^{\infty} ar^n = a + ar + ar^2 + \cdots + ar^n$

$\vec{v} = v_1\vec{i} + v_2\vec{j} = \langle v_1, v_2 \rangle$

3 Table

Graph Border Encoding		
Bit	plot	splot
1	bottom	bottom left front
2	left	bottom left back
4	top	botton right front
8	right	bottom right back
16	no effect	left vertical
32		back vertical
64		right vertical
128		front vertical
256		top left back
512		top right back
1024		top left front
2048		top right front

Table 1: Table Template

The position of table is decided by compiler, unless you specify where it should be.

1	2	3	4	5	6
$f(x)$	10	5	5	4	5

1	2	3	4	5	6
1	2	3	4	5	6

Table 2: Test Table

$f(x)$	$f'(x)$
$x > 0$	The function $f(x)$ is increasing. The function $f(x)$ is increasing. The function $f(x)$ is increasing.

4 list

4.1 basic options

1. pencil
2. calculator
3. ruler
    (a) steel ruler
        i. long steel ruler
        ii. short steel ruler

6. pencil
7. calculator
8. ruler

Bullet list

- pencil
- calculator
- ruler

Custom bullet for enumerate environment

one pencil

two calculator

ruler

5 text document formatting

5.1 font size and style

This will produce *italicized* text.

This will produce **bold face** text.

This will produce SMALL CAPS text.

This will produce `typewriter font` text.

Please visit Michelle Krummel's website at `http://michellekrummel.com` Use href to set text you want to display for hyperlink like This This will produce large font

This will produce Large font

This will produce huge font

This will produce Huge font

This will produce normal font

This will produce small font

This will produce footnotesize font

This will produce scriptsize font

This will produce tiny font

5.2 text color

Define textcolor by yourself

```
\definecolor{rublue}{HTML}{0036A7} %self-defined color
\newcommand{\bluetext}[1]{\textcolor{blue}{#1}} %for faster colouring
```

This can change color of text

5.3 alignment

This line is centered

This line is left-justified

This line is right-justified

5.4 verbatim

Use verbatim to "display normally", ignoring all latex commands. Useful when typing contents containing programming language. Beware that verbatim environment ignores **tab**, but preserves **space**.

```
#include<iostream>
int main(){
std::out << Hello World << std::endl;
return 0;
}
```

5.5 listings

ChatGPT strongly recommend using `listings` for program-related content. To use it, you have to include use package `listings` adn use the command `lstset` first:

```
\lstset{
basicstyle=\ttfamily, %use typewriter font
keywordstyle=\color{*}
commentstyle=\color{*},
stringstyle=\color{*}, % Strings in red
tabsize=4, % Set tab size to 4 spaces
showspaces=false, % Do not show spaces
showstringspaces=false, % Do not show string spaces
breaklines=true, % Automatic line breaking
frame=single % Add a frame around the code
}
```

Then you can use display your code in a "IDE" way

```
    def example_function():
    # This is a comment
    print("Hello, world!") # Print statement

    if True:
    print("Condition met")
    else:
    print("Condition not met")
```

6 Picture

Figure 1: picture