Latex Example and Snippet

```
\[\text{Latex Example and Snippet} \]
```

Derive circle parametric equation

$$\mathcal{V} \quad \mathcal{W}$$

```
\mathcal{V}
\mathcal{W}
```

multiple line search(matrix block)	`/\\begin{bmatrix}*\_.\{-}\\end{bmatrix}`
multiple line search	`/\\begin{bmatrix}*\_.\{-}\\end{bmatrix}`

Greek Symbols

A α \alpha	E ϵ
B β	Z ζ
Γ γ	E η
Δ δ	Θ θ
E ϵ	I ι

crazy symbols

`\cdot`	$\cdot$
`\cdots`	$\cdots$
`\ddots`	$\ddots$
`\reflectbox{$\ddots$}`	$\reflectbox{$\ddots$}$
`\vdots`	$\vdots$
`\vdots`	$\vdots$
`\frac{dy}{dx}`	$\frac{dy}{dx}$
`\dfrac{dy}{dx}`	$\dfrac{dy}{dx}$
`\frac{dy}{dx}`	$\frac{dy}{dx} = \frac{d^2y}{dx^2}$
`\dfrac{dy}{dx}`	$\dfrac{dy}{dx} = \dfrac{d^2y}{dx^2}$

```
\frac{\partial u}{\partial x} = h^2
    \left( \frac{\partial^2 u}{\partial x^2} +
    \frac{\partial^2 u}{\partial y^2} +
    \frac{\partial^2 u}{\partial z^2}
    \right)
```

$$\frac{\partial u}{\partial x} = h^2 \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \right)$$

Table

10	20	30	40	50
0.8	28	38	48	58
28	38	48	58	68
0.7	108	118	128	99
98	108	118	128	88

```
    \begin{tabular}{|c|c|c|c|c|}
    \hline
    10  & 20  & 30  & 40  & 50 \\ \hline
    0.8 & 28  & 38  & 48  & 58 \\ \hline
    28  & 38  & 48  & 58  & 68 \\ \hline
    0.7 & 108 & 118 & 128 & 99 \\ \hline
    98  & 108 & 118 & 128 & 88 \\ \hline
    \end{tabular}
```

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ n+1 & \text{if } n \text{ is odd} \end{cases}$$

```
    f(n) =
    \begin{cases}
        n/2 \quad \text{ if } n \text{ is even} \\
        n+1 \quad \text{ if } n \text{ is odd} \\
    \end{cases}
```

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

```
    A= \begin{bmatrix}
    1 & 2 & 3\\
    4 & 5 & 6\\
    7 & 8 & 9
    \end{bmatrix}
```

$$A = \left| \begin{array}{ccc} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{array} \right|$$

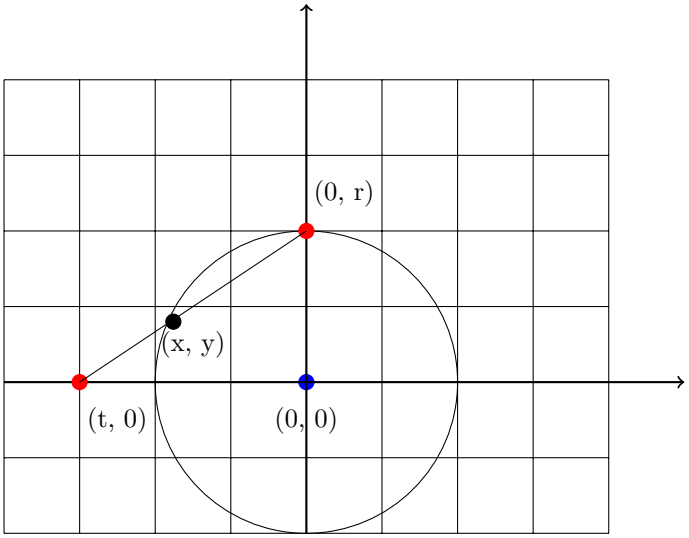
```
    A= \left| \begin{array}{ccc}
    1 & 2 & 3\\
    4 & 5 & 6\\
    7 & 8 & 9
    \end{array} \right|
```

$$A = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$$

```
A= \begin{matrix}
1 & 2 & 3\\
4 & 5 & 6\\
7 & 8 & 9
\end{matrix}
```

$$\left[\begin{array}{ccc|c} 1 & 2 & 3 & 1 \\ 4 & 5 & 6 & 2 \\ 7 & 8 & 10 & 5 \end{array}\right]$$

```
&\left[\begin{array}{ccc|c}
1 & 2 & 3  & 1\\
4 & 5 & 6  & 2\\
7 & 8 & 10 & 5\\
\end{array}\right]
```




```
\begin{tikzpicture}[yscale=-1]
    % 4x4 grid
    \draw (-2, 0) grid (6, 6);
    % origin point
    \draw [color=blue, fill=blue] (2, 4) circle (0.1);
    % x-axis
    \draw [thick,->] (-2, 4) -- (7, 4);
    % y-axis
    \draw [thick,->] (2, 6) -- (2, -1);
    % origin label
    \node at (2, 4.5) {(0, 0)};
    \draw (2, 4) circle (2);
    \draw [color=red, fill=red] (2, 2) circle(0.1);
    \node at (2.5, 1.5){(0, r)};
    \draw [color=red, fill=red] (-1, 4) circle(0.1);
    \node at (-0.5, 4.5){(t, 0)};
    \draw (2, 2)--(-1, 4);
    \node at (0.5, 3.5){(x, y)};
    \draw [color=black, fill=black] (0.24, 3.2) circle(0.1);
\end{tikzpicture}\\ \\
```

1 Small Subscript

```
https://tex.stackexchange.com/questions/262295/make-subscript-size-smaller-always

\documentclass{article}
\catcode`_=\active
\newcommand_[1]{\ensuremath{\sb{\scriptscriptstyle #1}}}
Original: $A_{\scriptstyle 1}^2$ \\
new: $A_{\scriptscriptstyle 1}^2$ \\
```

Original: $A_{\scriptstyle 1}^2$
new: $A_{\scriptscriptstyle 1}^2$

2 Matrix dots

$$L_k = I + v_k e_k^* = \begin{bmatrix} 1 & & & & \\ & \ddots & & & \\ & & 1 & & \\ & & l_{k+1,k} & & \\ & & \vdots & \ddots & \\ & & l_{m,k} & & 1 \end{bmatrix}$$

```
    L_k = I + v_k e_{k}^{*} = \begin{bmatrix}
                    1 &        &            &        & \\
                      & \ddots &            &        & \\
                      &        & 1          &        & \\
                      &        & l_{k+1,k}  &        & \\
                      &        & \vdots     & \ddots & \\
                      &        & l_{m,k}    &        & 1 \\
                    \end{bmatrix} \\
```

3 Change the width and height of a page

```
%
\usepackage{geometry}
\geometry{paperwidth=18cm, paperheight=80cm}
```

4 Math Mode Text

$$x + y = z$$
$$x + y = z$$

This is long text for math mode x, y, z

$$x + y = z$$
$$x + y = z$$

```
    x + y &= z \\
    x + y &= z \\
\intertext{This is long text for math mode $x, y, z$}
    x + y &= z \\
    x + y &= z \\
```

$$x + y = z$$
$$x + y = z \qquad \text{(Where is } x\text{)}$$
$$x + y = z$$
$$x + y = z$$

```
    x + y &= z \\
    x + y &= z \tag{ Where is $x$} \\
    x + y &= z \\
    x + y &= z \\
```

$$x + y = z$$
$$x + y = z \quad \text{Where is } x$$
$$x + y = z$$
$$x + y = z$$

```
    x + y &= z \\
    x + y &= z  \quad \mbox{ Where is $x$} \\
    x + y &= z \\
    x + y &= z \\
```

5 Math mode inside verbatim

abc α, β, ϕ

The limit of function

$$\lim_{h \to 0} \frac{f(x + h) - f(x)}{h}$$

```
\begin{alltt}
\usepackage{alltt}
The limit of function \( \lim_{h \to 0} \frac{f(x + h) - f(x)}{h} \)
\end{alltt}
```

6 Set

$\emptyset \quad \cap \quad \cup \quad \mid$ \\
$\{1, 2, 3, \dots \}$ \\
$\{ x \mid x < 3 \mbox{ and } x > 10 \}$ \\
$\mathcal{A} = \cup (U_{\alpha}, \phi_{\alpha})$

```
    $\emptyset \quad \cap \quad \cup \quad \mid$ \\
    $\{1, 2, 3, \dots \}$ \\
    $\{ x \mid x < 3 \mbox{ and } x > 10 \}$ \\
    $\mathcal{A} = \cup (U_{\alpha}, \phi_{\alpha})$
```

- C++
- Java
- Haskell

```
\begin{itemize}
\item C++
\item Java
\item Haskell
\end{itemize}
```

1. C++
2. Java
3. Haskell

```
\begin{enumerate}
\item C++
\item Java
\item Haskell
\end{itemize}
```