

LaTeX in SLATE

| | |
|---------------------------------|---|
| Common Symbols | 1 |
| Subscripts & Superscripts | 3 |
| Fractions & Roots | 4 |
| Brackets | 5 |
| Multiline Formulas | 6 |
| Matrices | 7 |
| Limits & Integrals | 8 |

Operations

\times \times

\pm \pm

\otimes \otimes

\div \div

\oplus \oplus

\oslash \oslash

\cdot \cdot

\ominus \ominus

\odot \odot

Relations

\leq \leq

\approx \approx

\geq \geq

\equiv \equiv

Big Operators

Σ \sum

\bigcup \bigcup

Π \prod

\bigcap \bigcap

Set Notation

\emptyset \emptyset

\in \in

\supset \supset

\cap \cap

\subset \subset

\supseteq \supseteq

\cup \cup

\subseteq \subseteq

Logic

\neg \neg

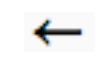








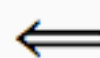


\forall \forall

\wedge \wedge








\exists \exists

\vee \vee

Arrows








| | | | | | |
|---|-----------------------------|---|------------------------------|---|----------------------------------|
|  | <code>\leftarrow</code> |  | <code>\rightarrow</code> |  | <code>\leftrightarrow</code> |
|  | <code>\longleftarrow</code> |  | <code>\longrightarrow</code> |  | <code>\longleftrightarrow</code> |
|  | <code>\Leftarrow</code> |  | <code>\Rightarrow</code> |  | <code>\Leftrightarrow</code> |
|  | <code>\Longleftarrow</code> |  | <code>\Longrightarrow</code> |  | <code>\Longleftrightarrow</code> |

Other Symbols

| | | | | | |
|---|---------------------|---|------------------------|---|---------------------|
|  | <code>\pi</code> |  | <code>\infty</code> |  | <code>\angle</code> |
|  | <code>\perp</code> |  | <code>\parallel</code> |  | <code>\cdots</code> |
|  | <code>\ldots</code> | | | | |







Not

Using the command `\not` in front of a symbol command, you can negate that symbol. For example:

| | | | | | |
|---|--------------------------|---|-----------------------|---|----------------------------|
|  | <code>\not=</code> |  | <code>\not<</code> |  | <code>\not\geq</code> |
|  | <code>\not\subset</code> |  | <code>\not\in</code> |  | <code>\not\parallel</code> |
|  | <code>\not\exists</code> | | | | |

Greek Letters

You can produce a lowercase Greek letter by typing the name of the letter after a `\` or an uppercase Greek letter by typing the name of the letter after a `\` with the first letter capitalized. For example:

| | | | | | |
|---|---------------------|---|----------------------|---|-----------------------|
|  | <code>\alpha</code> |  | <code>\theta</code> |  | <code>\sigma</code> |
|  | <code>\Gamma</code> |  | <code>\Lambda</code> |  | <code>\Upsilon</code> |

Subscripts & Superscripts

Add a single character subscript using the `_` button.

| | | | | | |
|-------|------------------|-------|------------------|----------------|---------------------------|
| x_6 | <code>x_6</code> | r_0 | <code>r_0</code> | $c_1 \leq c_2$ | <code>c_1 \leq c_2</code> |
|-------|------------------|-------|------------------|----------------|---------------------------|

Add a subscript with more than one character using the `_` button and putting the subscript in `{ }`.

| | | | | | |
|----------|---------------------|----------------------|---------------------------------------|---------------------|--------------------------------|
| x_{20} | <code>x_{20}</code> | $\sum_{0 < x < 100}$ | <code>\sum_{0 < x < 100}</code> | $\bigcup_{s \in S}$ | <code>\bigcup_{s \in S}</code> |
|----------|---------------------|----------------------|---------------------------------------|---------------------|--------------------------------|

Add a superscript the same way you add a subscript, except using the `^` button instead of `_`.

| | | | | | |
|-------|------------------|----------|---------------------|--------------|-------------------------|
| x^4 | <code>x^4</code> | x^{2a} | <code>x^{2a}</code> | $a^{2^{10}}$ | <code>a^{2^{10}}</code> |
|-------|------------------|----------|---------------------|--------------|-------------------------|

You can add both subscripts and superscripts to the same character. It does not matter what order you apply the subscript and superscript.

| | | | | | |
|---------|--------------------|---------|--------------------|--------------------|-------------------------------|
| x_0^2 | <code>x_0^2</code> | x^2_0 | <code>x^2_0</code> | $\sum_{i=1}^{100}$ | <code>\sum_{i=1}^{100}</code> |
|---------|--------------------|---------|--------------------|--------------------|-------------------------------|

To have the subscript and superscript appear slightly separated, add the empty `{ }` brackets before you add the second script.

| | | | | | |
|---------|--------------------|---------|--------------------|---------------|--------------------------|
| x_0^2 | <code>x_0^2</code> | x^2_0 | <code>x^2_0</code> | t_{ab}^{cd} | <code>t_{ab}^{cd}</code> |
|---------|--------------------|---------|--------------------|---------------|--------------------------|

Fractions

You can create a fraction in LaTeX using the command $\frac{\text{numerator}}{\text{denominator}}$.

$$\frac{1}{2}$$

$\frac{1}{2}$

$$m = \frac{\Delta y}{\Delta x}$$

$m = \frac{\Delta y}{\Delta x}$

$$\frac{1}{1 - \frac{1}{x}}$$

$\frac{1}{1 - \frac{1}{x}}$

$$\frac{d}{dx} \sin(x) = \cos(x)$$

$\frac{d}{dx} \sin(x) = \cos(x)$

Roots

You can create a square root in LaTeX using the command $\sqrt{\text{expression}}$.

$$\sqrt{100} = 10$$

$\sqrt{100} = 10$

$$\sqrt{b^2}$$

$\sqrt{b^2}$

You can create an nth root in LaTeX using the command $\sqrt[n]{\text{expression}}$.

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

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

$$\sqrt[n]{x - \sqrt{x^2 - x}}$$

$\sqrt[n]{x - \sqrt{x^2 - x}}$

Brackets

In addition to the `() [] ||` brackets which you type normally, the following brackets are available:

`[` `\lfloor`
`]` `\rceil`

`]` `\rfloor`
`{` `\{`

`[` `\lceil`
`}` `\}`

You can create large brackets that adjust to the size of the formula they surround using the commands `\left` and `\right` before the bracket.

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

`(\frac{1}{2})`

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

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

$$\left\lfloor \frac{1}{1 + \frac{1}{x}} \right\rfloor$$

`\left\lfloor \frac{1}{1 + \frac{1}{x}} \right\rfloor`

Multiline Formulas

You can create multiline formulas in LaTeX as follows:

1. Enter the command `\begin{eqnarray*}`. Press enter for clarity.
2. Enter each line of your formula on a separate line. On each line:
 - Place `&` symbols surrounding the symbol you want your formulas to be aligned under.
 - Place `\\` at the end of each line.
3. After you have entered each line of your formula, enter the command `\end{eqnarray*}`

$$\begin{aligned}
 y &= 2x^2 - 8x - 24 \\
 &= 2(x^2 - 4x - 12) \\
 &= 2(x + 2)(x - 6)
 \end{aligned}$$

```

\begin{eqnarray*}
y &=& 2x^2-8x-24 \\
&=& 2(x^2-4x-12) \\
&=& 2(x+2)(x-6)
\end{eqnarray*}

```

TIP: If you want more space between your lines, add `\\` instead of `\\` at the end of each line of your formula.

$$\begin{aligned}
 \frac{4}{x} &\geq \frac{10}{3} \\
 10x &\geq 4(3) \\
 10x &\geq 12 \\
 x &\geq \frac{10}{12} \\
 x &\geq \frac{5}{6}
 \end{aligned}$$

```

\begin{eqnarray*}
\frac{4}{x} &\geq& \frac{10}{3} \\
10x &\geq& 4(3) \\
10x &\geq& 12 \\
x &\geq& \frac{10}{12} \\
x &\geq& \frac{5}{6}
\end{eqnarray*}

```

Matrices

We can create matrices in LaTeX using our knowledge of brackets and multiline formulas.

1. If you want your matrix to be enclosed by brackets, use the `\left` command followed by your bracket type to enter the opening bracket.
2. Enter the command `\begin{array}{alignment}`. Under *alignment*, we will enter how we want each column of our matrix to be aligned using the commands l for left, c for centre, and r for right. For example, if we have 3 columns, and want the first column to be aligned left, second column to be aligned centre, and third column to be aligned right, the command would be `\begin{array}{lcr}`.
Hit enter.
3. Enter each row of your matrix on a separate line. On each line:
 - Place a `&` symbol between each entry in the matrix.
 - Place `\\` at the end of each line.
4. Enter the command `\end{array}`.
5. If you want your matrix to be enclosed by brackets, use the `\right` command followed by your bracket type to enter the closing bracket.

$$\begin{bmatrix} \lambda - 1 & 0 & 0 \\ 0 & \lambda - 1 & 0 \\ 0 & 0 & \lambda - 1 \end{bmatrix}$$

```
\left[ \begin{array}{ccc}
\lambda -1 & 0 & 0 \\
0 & \lambda -1 & 0 \\
0 & 0 & \lambda -1
\end{array} \right]
```

To only include a large left bracket, use the command `\left.` to void the right bracket (or vice versa).

$$|a| = \begin{cases} a & \text{if } a \geq 0 \\ -a & \text{if } a < 0 \end{cases}$$

```
|a| = \left\{ \begin{array}{cl}
a & \text{if } a \geq 0 \\
-a & \text{if } a < 0
\end{array} \right.
```


Limits

We create limits using the command `\lim` and subscripts.

$$\lim_{x \rightarrow -\infty}$$

`\lim_{x \rightarrow -\infty}`

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2$$

`\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = 2`

Integrals

Likewise, we create integrals using the command `\int` and subscripts and superscripts (for definite integrals).

$$\int_a^b f(x) dx = F(b) - F(a)$$

`\int_a^b f(x) dx = F(b) - F(a)`

$$\int \cos \theta d\theta = \sin \theta$$

`\int \cos \theta d\theta = \sin \theta`