

Introduction to L^AT_EX with Mathematics

Math Mode

In L^AT_EX, mathematics is written in **math mode**. There are two main types:

- **Inline math:** inside text, use dollar signs: `$a^2 + b^2 = c^2$` gives $a^2 + b^2 = c^2$.
- **Display math:** centered on its own line, use `\[... \]`:

$$a^2 + b^2 = c^2$$

Superscripts and Subscripts

- Superscripts: `x^2` gives x^2
- Subscripts: `x_1` gives x_1
- Group multiple characters with `{ }`: `x^{10}` gives x^{10}

Fractions, Roots, and Sums

- Fractions: `\frac{a}{b}` gives $\frac{a}{b}$
- Square root: `\sqrt{x}` gives \sqrt{x}
- nth root: `\sqrt[n]{x}` gives $\sqrt[n]{x}$
- The quadratic formula can be written with:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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- Summation: `\sum_{n=1}^{\infty} \frac{1}{n^2}`

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$

- A set: `S = \{2,3,5,7,11,...\}` gives $S = \{2,3,5,7,11,...\}$

Greek Letters

Use a backslash followed by the letter name:

$$\alpha, \beta, \gamma, \Delta, \pi, \theta, \mu, \Omega$$

Example code: `\alpha, \beta, \gamma, \Delta, \pi, \theta, \mu, \Omega`

Some Symbols

$$\pm \quad \cdot \quad \leq \quad \geq \quad \neg \quad \wedge \quad \vee \quad \infty \quad \cap \quad \cup \quad \in$$

`\pm` `\cdot` `\leq` `\geq` `\neg` `\land` `\lor` `\infty` `\cap` `\cup` `\in`

Lists

An list is either numbered with `enumerate` or bulleted with `itemize`.

Code	Result
<pre>\begin{itemize} \item First \begin{itemize} \item Sublist first \item Sublist second \end{itemize} \item Second \item Third \end{itemize}</pre>	<ul style="list-style-type: none">• First<ul style="list-style-type: none">– Sublist first– Sublist second• Second• Third

Table

Tables are made using the `tabular` environment.

Code	Result												
<pre>\begin{tabular}{ c c c } \hline \$a\$ & \$b\$ & \$a+b\$ \\ \hline 1 & 2 & 3 \\ 2 & 3 & 5 \\ 3 & 4 & 7 \\ \hline \end{tabular}</pre>	<table><tr><th>a</th><th>b</th><th>$a + b$</th></tr><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>2</td><td>3</td><td>5</td></tr><tr><td>3</td><td>4</td><td>7</td></tr></table>	a	b	$a + b$	1	2	3	2	3	5	3	4	7
a	b	$a + b$											
1	2	3											
2	3	5											
3	4	7											

Matrices

Matrices are made with a `matrix` environment in math mode.

Code	Result
<pre>\[\begin{vmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{vmatrix} \]</pre>	$\begin{vmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{vmatrix}$
<pre>\[\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix} \]</pre>	$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$