Mathematics and Lists

Your Name

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1 Inline Mathematics

LaTeX excels at typesetting mathematics. Use dollar signs for inline math: $y = mx + b$. Greek letters are easy: α, β, γ, σ, μ.

2 Display Mathematics

For standalone equations, use backslash-brackets:

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

Or use the equation environment for numbered equations:

$$S_n = \frac{1}{n} \sum_{i=1}^{n} X_i \tag{1}$$

We can reference Equation 1 later in the text.

2.1 Aligned Equations

The `align` environment is used for multi-line equations with alignment points (marked by `&`):

$$f(x) = x^2 + 2x + 1 \tag{2}$$
$$= (x + 1)^2 \tag{3}$$

Each line gets its own equation number. We can reference them: Equation 2 and Equation 3.

The starred version `align*` suppresses all equation numbers:

$$\begin{aligned} \mathbb{E}[X] &= \mu \\ \mathrm{Var}(X) &= \mathbb{E}[(X - \mu)^2] \\ &= \mathbb{E}[X^2] - \mu^2 \end{aligned}$$

The difference: The `*` in `align*` means "no numbering." This convention is consistent across many LaTeX environments—adding `*` removes automatic numbering (e.g., `equation*`, `gather*`).

3 Common Math Notation

Subscripts and superscripts: x_i, x^2, x_i^2, e^{-rt}

Fractions: $\frac{a}{b}$, $\frac{\partial f}{\partial x}$

Square roots: $\sqrt{2}$, $\sqrt[3]{8}$

Summations and products:

$$\sum_{i=1}^{n} x_i \quad \prod_{j=1}^{m} y_j \quad \int_0^{\infty} e^{-x} dx$$

4 Lists

4.1 Numbered Lists

1. First item
2. Second item
3. Third item

4.2 Bullet Points

- Apples
- Oranges
- Bananas

5 Text Formatting

You can make text **bold**, *italic*, or `monospace`.

Use *emphasis* for semantic markup—it's italic in regular text but upright in italic context.