Mathematics in LaTeX

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1 Introduction

LaTeX is the de facto standard for writing mathematical documents.

2 Inline vs Display Math

The equation for a line is $y = mx + b$.

For more complex equations, use display mode:

$$E = mc^2$$

3 Fractions and Roots

Simple Fraction: $\frac{1}{2}$ Nested Fraction: $\frac{1}{1+\frac{1}{x}}$ Square Root: $\sqrt{2}$ Cube Root: $\sqrt[3]{27}$

4 Common Notation

4.1 Greek Letters

$\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega$

$\Gamma, \Delta, \Theta, \Lambda, \Xi, \Pi, \Sigma, \Upsilon, \Phi, \Psi, \Omega$

4.2 Operators

Summation: $\sum_{i=1}^{n} i^2$ Integral: $\int_a^b f(x)dx$ Limit: $\lim_{x\to\infty} \frac{1}{x} = 0$

5 Matrices

Matrix using `pmatrix`:

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

Matrix using `bmatrix`:

$$\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$$

6 Aligned Equations

$$
\begin{aligned}
(a+b)^2 &= (a+b)(a+b) && (1)\\
&= a^2 + ab + ba + b^2 && (2)\\
&= a^2 + 2ab + b^2 && (3)
\end{aligned}
$$