

# Sample LaTeX Document with Math Equations

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## 1 Introduction

This document provides examples of various mathematical equations formatted in LaTeX.

## 2 Basic Equations

Here are some basic equations:

$$a^2 + b^2 = c^2 \tag{1}$$

$$E = mc^2 \tag{2}$$

## 3 Fractions and Sums

LaTeX makes it easy to write fractions and sums:

$$\frac{a}{b} \tag{3}$$

$$\sum_{i=1}^n i = \frac{n(n+1)}{2} \tag{4}$$

## 4 Integrals and Derivatives

You can also write integrals and derivatives:

$$\int_0^\infty e^{-x} dx = 1 \tag{5}$$

$$\frac{d}{dx} (x^2) = 2x \tag{6}$$

## 5 Matrices

Matrices are another important part of LaTeX math:

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \tag{7}$$

## 6 Greek Letters and Special Symbols

LaTeX supports Greek letters and special symbols:

$$\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega \tag{8}$$

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0} \tag{9}$$

## 7 Advanced Equations

Here are some more advanced equations:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1 \tag{10}$$

$$\int_a^b f(x) \, dx = F(b) - F(a) \tag{11}$$