

Hello World! Hello L^AT_EX!

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1 Text

1.1 General

Hello World!

Paragraphs are useful as they make reading large blocks of text easier.
It really is great.

1.2 Formatting

This text will be *italised*.

This text will be **bold**.

This text will be SMALL CAPS.

This text will be typewriter typeface.

This text will be tiny.

This text will be small.

This text will be normal.

This text will be large.

This text will be Large.

This text will be huge.

This text will be Huge.

1.3 Alignment

This text is centre aligned.

This text is right aligned.

This text is left aligned.

1.4 Set Notation

Natural Numbers: \mathbb{N}

Integers Numbers: \mathbb{Z}

Real Numbers: \mathbb{R}

Complex Numbers: \mathbb{C}

2 Maths Notation

2.1 General

Suppose we are given a rectangle with sides of length $(x + 1)$ and $(x + 3)$. The equation $A = x^2 + 4x + 3$ represents the area of the rectangle.

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$$A = x^2 + 4x + 3$$

represents the area of the rectangle.

About $\frac{2}{3}$ of the glass is full.

2.2 Superscript

$$\begin{aligned} 2x^3 \\ 2x^{34} \\ 2x^{2x^4+5} \end{aligned}$$

2.3 Subscript

$$\begin{aligned} x_1 \\ x_1, \dots, x_{10} \\ x_{1_2} \end{aligned}$$

2.4 Greek Letters

$$\begin{aligned} \alpha, \beta, \dots, \omega \\ A = \pi r^2 \end{aligned}$$

2.5 Trigonometry

$$1 = \sin^2 x + \cos^2 x$$

2.6 Logs

$$\begin{aligned} \log x, \log_{10} x, \log_2 x \\ \ln x \end{aligned}$$

2.7 Roots

$$\begin{aligned} \sqrt{4} &= \pm 2 \\ \sqrt[3]{8} &= 2 \\ z &= \sqrt{x^2 + y^2} \end{aligned}$$

2.8 Fractions

About $\frac{2}{3}$ of the glass is full.

2.9 Brackets

$$\begin{aligned}(x+1) \\ 3[2+(x+1)] \\ \{a,b,c\} \\ 3\left(\frac{2}{5}\right) \\ 3\left[\frac{2}{5}\right] \\ 3\left\{\frac{2}{5}\right\} \\ \left|\frac{x}{x+1}\right| \\ \left.\frac{dy}{dx}\right|_{x=1}\end{aligned}$$

2.10 Tables

x	1	2
$f(x)$	11	12

2.11 Equation Arrays

$$\begin{aligned}5x^2-9 &= x^2+3 \\ 4x^2 &= 12 \\ x^2 &= 3 \\ x &= \pm\sqrt{3}\end{aligned}$$

2.12 Calculus

The equation $f(x) = (x-3)^2 + \frac{1}{2}$ with domain $D_f : (-\infty, \infty)$ has range $R_f : [-\frac{1}{2}, \infty]$

$$\lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a} = f'(a)$$

$$\int \sin(x) \, dx = -\cos(x) + c$$

$$\int_a^b \sin(x) \, dx = \cos(a) - \cos(b)$$

$$\sum_{n=1}^{\infty} ar^n = a + ar + ar^2 + \cdots + ar^n$$

2.13 Matrices

$$\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$

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

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$