LaTeX Tutorial 2: Basic Math Notation

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1 Superscripts:

$$2x^3$$

More than 1 character in the exponent:

$$2x^{34}$$

Functions in the exponent:

$$2x^{3x+4}$$

Power to a Power exponents:

$$2x^{3x^4+5}$$

2 Subscripts:

$$x_1 + x_{12}$$

Subscript in a subscript:

$$x_{1_{12}} + y_{1_{2_3}}$$

Series:

$$a_0 + a_1 + a_2 + \ldots + a_n$$

3 Greek Letters:

Some Popular Examples:

$$\pi \ \Pi \ \alpha \ \varepsilon$$

Equations With Greek Letters: Area of a circle:

$$A = \pi r^2$$

4 Trigonometric Functions:

Some Popular Examples:

$$y = \sin(x)$$

$$y = \cos(\theta)$$

$$\theta = \tan^{-1}\left(\frac{y}{x}\right)$$

$$\theta = \arcsin\left(\frac{y}{r}\right)$$

5 Log Functions:

$$\text{Common Log (Base 10) : } \ y = \log(x)$$

$$\text{Log Base 2 (Binary) : } \ y = \log_2(x)$$

$$\text{Log Base } e \text{ (Natural Log) : } \ y = \ln(x)$$

An Easier Way:

$$\text{Common Log (Base 10): } y = \log(x)$$

$$\text{Log Base 2 (Binary): } y = \log_2(x)$$

$$\text{Log Base } e \text{ (Natural Log): } y = \ln(x)$$

6 Roots:

$$\text{Square Roots: } \sqrt{2}$$

$$\text{Cube Roots: } \sqrt[3]{8} = 2$$

$$n\text{th root: } \sqrt[n]{x}$$

$$\text{Pythagorean Theorem: } r = \sqrt{x^2 + y^2}$$

$$\text{Square Root Inside a Square Root: } \sqrt{1 + \sqrt{3x^2 + 3}}$$

7 Fractions:

A Simple Fraction (Display Mode):

$$\frac{2}{3}$$

In a sentence (resized):

$$\text{Is the glass } \tfrac{1}{2} \text{ empty or } \tfrac{1}{2} \text{ full?}$$

In a sentence (Display Mode):

$$\text{Is the glass } \frac{1}{2} \text{ empty or } \frac{1}{2} \text{ full?}$$

$$\text{With ams packages: } \frac{1}{2} \text{ empty or } \frac{1}{2} \text{ full?}$$

More Complex Fractions:

$$\frac{\sqrt{x+1}}{\sqrt{x+2}}$$

$$\frac{1}{1+\alpha e^{-x}}$$

$$\frac{x^3}{1+\frac{1}{\sqrt{x}}}$$