

# L<sup>A</sup>T<sub>E</sub>X 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:

$$x_{1_{12}} + y_{1_{23}}$$

Series:

$$a_0 + a_1 + a_2 + \dots + a_n$$

## 3 Greek Letters:

Some Popular Examples:

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

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:

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

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

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

Another Way:

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

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

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

## 6 Roots:

Square Roots:  $\sqrt{2}$

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

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

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

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):

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

In a sentence (Display Mode):

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

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

More Complex Fractions:

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

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

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