# Mathematical Equations

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## Equations

1.
$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

2.
$$\lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n = e$$

3.
$$\lim_{x \to \infty} \frac{1}{x} = 0$$

4.
$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

5.
$$\sum_{k=1}^{n} k = \frac{n(n+1)}{2}$$

6.
$$\sum_{k=0}^{n} x^k = \frac{1 - x^{n+1}}{1 - x}, \quad (x \neq 1)$$

7.
$$x^2 - 4x + 3 = 0$$

8.
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

9.
$$\int_0^1 x^2 \, dx = \frac{1}{3}$$

10.

$$\int_{-\infty}^{\infty} e^{-x^2}\,dx = \sqrt{\pi}$$

11.

$$x_1 + x_2 + \cdots + x_n$$

12.

$$\underbrace{x + y}_{\text{Sum of two numbers}}$$

13.

$$\overbrace{x \cdot y}^{\text{Product of two numbers}}$$

14.

$$\overline{x + y} = \overline{x} + \overline{y}$$

15.

$$\sqrt{a^2 + b^2}$$

16.

$$\sqrt[n]{x}$$

17.

$$\frac{a}{b}$$

18.

$$\frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy}$$

19.

$$x \cdot y = y \cdot x \quad \text{(Commutative Property)}$$

20.

$$e^{i\pi} + 1 = 0 \quad \text{(Euler's Identity)}$$

21.

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

22.

$$\lim_{x \to 0} \frac{e^x - 1}{x} = 1$$

23.

$$\int e^x\,dx = e^x + C$$

24.

$$\lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n = e$$

25.

$$\frac{d}{dx}\sin x = \cos x$$