

Differentiation Formulas

$$\frac{d}{dx} k = 0 \quad (1)$$

$$\frac{d}{dx} [f(x) \pm g(x)] = f'(x) \pm g'(x) \quad (2)$$

$$\frac{d}{dx} [k \cdot f(x)] = k \cdot f'(x) \quad (3)$$

$$\frac{d}{dx} [f(x)g(x)] = f(x)g'(x) + g(x)f'(x) \quad (4)$$

$$\frac{d}{dx} \left(\frac{f(x)}{g(x)} \right) = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2} \quad (5)$$

$$\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x) \quad (6)$$

$$\frac{d}{dx} x^n = nx^{n-1} \quad (7)$$

$$\frac{d}{dx} \sin x = \cos x \quad (8)$$

$$\frac{d}{dx} \cos x = -\sin x \quad (9)$$

$$\frac{d}{dx} \tan x = \sec^2 x \quad (10)$$

$$\frac{d}{dx} \cot x = -\csc^2 x \quad (11)$$

$$\frac{d}{dx} \sec x = \sec x \tan x \quad (12)$$

$$\frac{d}{dx} \csc x = -\csc x \cot x \quad (13)$$

$$\frac{d}{dx} e^x = e^x \quad (14)$$

$$\frac{d}{dx} \ln|x| = \frac{1}{x} \quad (15)$$

$$\frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1-x^2}} \quad (16)$$

$$\frac{d}{dx} \cos^{-1} x = \frac{-1}{\sqrt{1-x^2}} \quad (17)$$

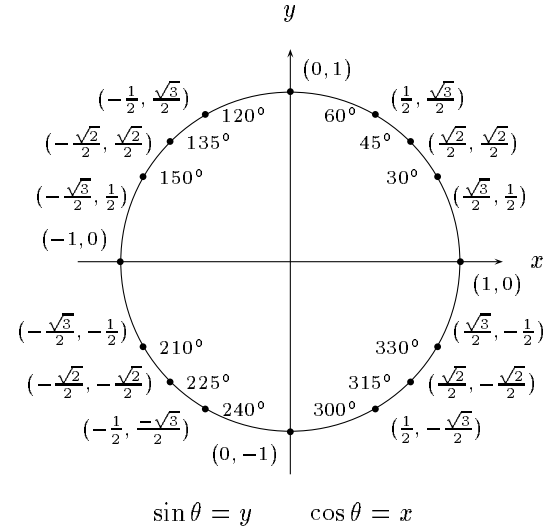
$$\frac{d}{dx} \tan^{-1} x = \frac{1}{x^2+1} \quad (18)$$

$$\frac{d}{dx} \cot^{-1} x = \frac{-1}{x^2+1} \quad (19)$$

$$\frac{d}{dx} \sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}} \quad (20)$$

$$\frac{d}{dx} \csc^{-1} x = \frac{-1}{|x|\sqrt{x^2-1}} \quad (21)$$

Trigonometry



Basic Identities

$$\tan x = \frac{\sin x}{\cos x} \quad (1)$$

$$\cot x = \frac{1}{\tan x} \quad (2)$$

$$\sec x = \frac{1}{\cos x} \quad (3)$$

$$\csc x = \frac{1}{\sin x} \quad (4)$$

Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1 \quad (5)$$

$$1 + \cot^2 x = \csc^2 x \quad (6)$$

$$\tan^2 x + 1 = \sec^2 x \quad (7)$$

Sum and Difference Formulas

$$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y \quad (8)$$

$$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y \quad (9)$$

Power Reducing Formulas

$$\sin^2 x = \frac{1 - \cos 2x}{2} \quad (10)$$

$$\cos^2 x = \frac{1 + \cos 2x}{2} \quad (11)$$