Differentiation Formulas

$$\frac{d}{dx}k = 0 \tag{1}$$

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

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

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

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

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

$$\frac{d}{dx}x^n = nx^{n-1} \tag{7}$$

$$\frac{d}{dx}\sin x = \cos x \tag{8}$$

$$\frac{d}{dx}\cos x = -\sin x \tag{9}$$

$$\frac{d}{dx}\tan x = \sec^2 x \tag{10}$$

$$\frac{d}{dx}\cot x = -\csc^2 x \tag{11}$$

$$\frac{d}{dx}\sec x = \sec x \tan x \tag{12}$$

$$\frac{d}{dx}\csc x = -\csc x \cot x \tag{13}$$

$$\frac{d}{dx}e^x = e^x \tag{14}$$

$$\frac{d}{dx}\ln|x| = \frac{1}{x} \tag{15}$$

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

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

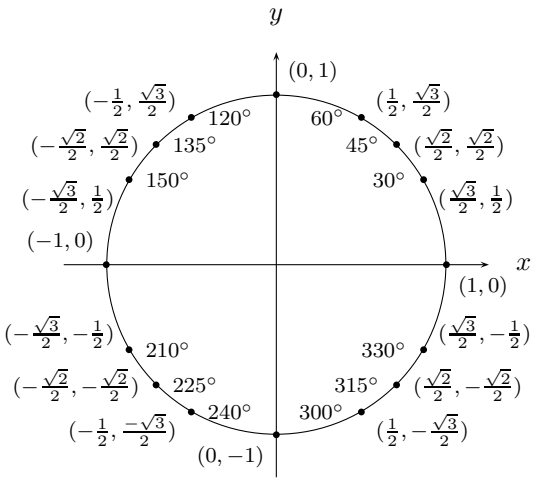
$$\frac{d}{dx}\tan^{-1} x = \frac{1}{x^2+1} \tag{18}$$

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

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

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

Trigonometry



$$\sin\theta = y \qquad \cos\theta = x$$

Basic Identities

$$\tan x = \frac{\sin x}{\cos x} \tag{1}$$

$$\cot x = \frac{1}{\tan x} \tag{2}$$

$$\sec x = \frac{1}{\cos x} \tag{3}$$

$$\csc x = \frac{1}{\sin x} \tag{4}$$

Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1 \tag{5}$$

$$1 + \cot^2 x = \csc^2 x \tag{6}$$

$$\tan^2 x + 1 = \sec^2 x \tag{7}$$

Sum and Difference Formulas

$$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y \tag{8}$$

$$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y \tag{9}$$

Power Reducing Formulas

$$\sin^2 x = \frac{1 - \cos 2x}{2} \tag{10}$$

$$\cos^2 x = \frac{1 + \cos 2x}{2} \tag{11}$$