Each trigonometric function in terms of the other five.[7]

in terms of	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\csc\theta$	$\sec\theta$	$\cot\theta$
$\sin\theta =$	$\sin\theta$	$\pm\sqrt{1-\cos^2\theta}$	$\pm\frac{\tan\theta}{\sqrt{1+\tan^2\theta}}$	$\frac{1}{\csc\theta}$	$\pm\frac{\sqrt{\sec^2\theta-1}}{\sec\theta}$	$\pm\frac{1}{\sqrt{1+\cot^2\theta}}$
$\cos\theta =$	$\pm\sqrt{1-\sin^2\theta}$	$\cos\theta$	$\pm\frac{1}{\sqrt{1+\tan^2\theta}}$	$\pm\frac{\sqrt{\csc^2\theta-1}}{\csc\theta}$	$\frac{1}{\sec\theta}$	$\pm\frac{\cot\theta}{\sqrt{1+\cot^2\theta}}$
$\tan\theta =$	$\pm\frac{\sin\theta}{\sqrt{1-\sin^2\theta}}$	$\pm\frac{\sqrt{1-\cos^2\theta}}{\cos\theta}$	$\tan\theta$	$\pm\frac{1}{\sqrt{\csc^2\theta-1}}$	$\pm\sqrt{\sec^2\theta-1}$	$\frac{1}{\cot\theta}$
$\csc\theta =$	$\frac{1}{\sin\theta}$	$\pm\frac{1}{\sqrt{1-\cos^2\theta}}$	$\pm\frac{\sqrt{1+\tan^2\theta}}{\tan\theta}$	$\csc\theta$	$\pm\frac{\sec\theta}{\sqrt{\sec^2\theta-1}}$	$\pm\sqrt{1+\cot^2\theta}$
$\sec\theta =$	$\pm\frac{1}{\sqrt{1-\sin^2\theta}}$	$\frac{1}{\cos\theta}$	$\pm\sqrt{1+\tan^2\theta}$	$\pm\frac{\csc\theta}{\sqrt{\csc^2\theta-1}}$	$\sec\theta$	$\pm\frac{\sqrt{1+\cot^2\theta}}{\cot\theta}$
$\cot\theta =$	$\pm\frac{\sqrt{1-\sin^2\theta}}{\sin\theta}$	$\pm\frac{\cos\theta}{\sqrt{1-\cos^2\theta}}$	$\frac{1}{\tan\theta}$	$\pm\sqrt{\csc^2\theta-1}$	$\pm\frac{1}{\sqrt{\sec^2\theta-1}}$	$\cot\theta$

$$\frac{d}{dx}\sin x = \cos x, \qquad \frac{d}{dx}\arcsin x = \frac{1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}\cos x = -\sin x, \qquad \frac{d}{dx}\arccos x = \frac{-1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}\tan x = \sec^2 x, \qquad \frac{d}{dx}\arctan x = \frac{1}{1+x^2}$$

$$\frac{d}{dx}\cot x = -\csc^2 x, \qquad \frac{d}{dx}\operatorname{arccot} x = \frac{-1}{1+x^2}$$

$$\frac{d}{dx}\sec x = \tan x \sec x, \qquad \frac{d}{dx}\operatorname{arcsec} x = \frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx}\csc x = -\csc x \cot x, \qquad \frac{d}{dx}\operatorname{arccsc} x = \frac{-1}{|x|\sqrt{x^2-1}}$$

Functions and Identities

$$\sin(\cos^{-1}x) = \sqrt{1-x^2} \qquad \tanh x = \frac{\sinh x}{\cosh x}$$

$$\cos(\sin^{-1}x) = \sqrt{1-x^2} \qquad \coth x = \frac{\cosh x}{\sinh x}$$

$$\sec(\tan^{-1}x) = \sqrt{1+x^2} \qquad \operatorname{csch}(x) = \frac{1}{\sinh x}$$

$$\tan(\sec^{-1}x) = \sqrt{x^2-1}, \text{ if } x \ge 1 \qquad \operatorname{sech}(x) = \frac{1}{\cosh x}$$

$$-\sqrt{x^2-1}, \text{ if } x \le -1 \qquad \cosh^2 x - \sinh^2 x = 1$$

$$\sinh^{-1}x = \ln(x+\sqrt{x^2+1})$$

$$\cosh^{-1}x = \ln(x+\sqrt{x^2-1}), x \ge 1$$

$$\tanh^{-1}x = \tfrac{1}{2}\ln\left(\frac{1+x}{1-x}\right), -1 < x < 1$$

$$\operatorname{sech}^{-1}x = \ln\left(\frac{1+\sqrt{1-x^2}}{x}\right), 0 < x \le 1$$

$$\sinh x = \frac{e^x - e^{-x}}{2}$$

$$\cosh x = \frac{e^x + e^{-x}}{2}$$

Trig Identities

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

$$1 + \tan^2 x = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

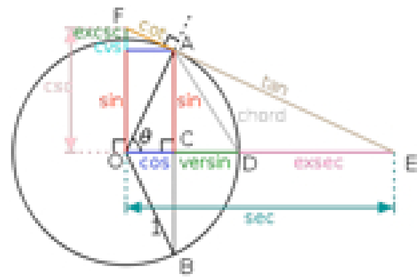
$$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$$

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

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$$

$$\sin 2x = 2\sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x = 1 - 2\sin^2 x = 2\cos^2 x - 1$$



$$\int a\cos nx\, dx = \frac{a}{n}\sin nx + c$$

$$\int \frac{du}{\sqrt{a^2-u^2}} = \sin^{-1}\left(\frac{u}{a}\right) + C$$

$$\int \frac{du}{a^2+u^2} = \frac{1}{a}\tan^{-1}\left(\frac{u}{a}\right) + C$$

$$\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\sec^{-1}\left|\frac{u}{a}\right| + C$$

$$\int \frac{dx}{\sin ax} = \frac{1}{a}\ln\left|\tan\frac{ax}{2}\right| + C$$

$$\int \sin ax\, dx = -\frac{1}{a}\cos ax + C$$

$$\int \sin^2 ax\, dx = \frac{x}{2} - \frac{1}{4a}\sin 2ax + C = \frac{x}{2} - \frac{1}{2a}\sin ax\cos ax + C$$

$$\int x\sin^2 ax\, dx = \frac{x^2}{4} - \frac{x}{4a}\sin 2ax - \frac{1}{8a^2}\cos 2ax + C$$

Integrals

$$\int \frac{1}{x}\,dx = \ln|x| + C \qquad \int \sinh(x)dx = \cosh x + C$$

$$\int e^x\,dx = e^x + C \qquad \int \cosh(x)dx = \sinh x + C$$

$$\int a^x\,dx = \frac{1}{\ln a}a^x + C \qquad \int \tanh(x)\operatorname{sec}h(x)dx = -\operatorname{sec}h(x) + C$$

$$\int x^a\,dx = \frac{x^{a+1}}{a+1} + C \qquad \int \operatorname{sec}h^2(x)dx = \tanh(x) + C$$

$$a = \text{constant}, \; a \ne -1$$

$$\int \frac{1}{\sqrt{1-x^2}}\,dx = \sin^{-1}(x) + C \qquad \int \operatorname{csc}h^2(x)dx = -\coth(x) + C$$

$$\int \frac{1}{1+x^2}\,dx = \tan^{-1}(x) + C \qquad \int \operatorname{csc}h(x)\coth(x)dx = -\operatorname{csc}h(x) + C$$

$$\int \frac{2}{x\sqrt{x^2-1}}\,dx = \sec^{-1}|x| + C$$