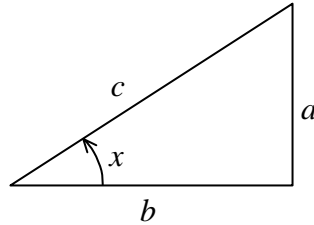


Basic relations

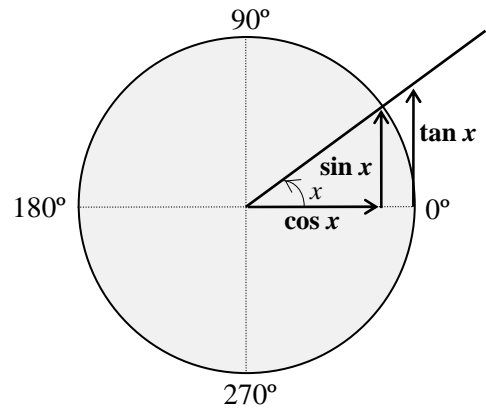
$$\sin x = \frac{\text{opposite side}}{\text{hypotenuse}} = \frac{a}{c}$$

$$\cos x = \frac{\text{adjacent side}}{\text{hypotenuse}} = \frac{b}{c}$$

$$\tan x = \frac{\text{opposite side}}{\text{adjacent side}} = \frac{a}{b}$$



Unit circle



$$\sin^2 x + \cos^2 x = 1 \quad 1 + \tan^2 x = \frac{1}{\cos^2 x} \quad \tan x = \frac{\sin x}{\cos x}$$

$$\sec x = \frac{1}{\cos x} \quad \operatorname{cosec} x = \frac{1}{\sin x} \quad \operatorname{cotan} x = \frac{\cos x}{\sin x} = \frac{1}{\tan x}$$

Special values

Deg.	0	30	45	60	90	120	135	150	180	210	225	240	270	300	315	330	360
Rad	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$	$2\pi/3$	$3\pi/4$	$5\pi/6$	π	$7\pi/6$	$5\pi/4$	$4\pi/3$	$3\pi/2$	$5\pi/3$	$7\pi/4$	$11\pi/6$	2π
sin x	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0
cos x	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
tan x	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	∞	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	∞	$-\sqrt{3}$	-1	$-\frac{\sqrt{3}}{3}$	0

Quadrants and signs

