



The Circular Functions

FUNCTION	GRAPH	DOMAIN	RANGE	PERIOD	FORMULAS
sine (odd fn)		all real numbers	$[-1, 1]$	2π	$\sin x = \sin(x + 2k\pi)$ $\sin(-x) = -\sin x$ $\sin(x + \pi) = -\sin x$ $\sin(x - \pi) = -\sin x$ $\cos x = \cos(x + 2k\pi)$ $\cos(-x) = \cos x$ $\cos(x + \pi) = -\cos x$ $\cos(x - \pi) = -\cos x$
cosine (even fn)		all real numbers	$[-1, 1]$	2π	$\csc x = \frac{1}{\sin x}$ $\sec x = \frac{1}{\cos x}$ $\tan x = \frac{\sin x}{\cos x} = \frac{1}{\cot x}$ $\cot x = \frac{\cos x}{\sin x} = \frac{1}{\tan x}$
tangent (odd fn)		all real numbers except $\frac{\pi}{2} + k\pi$	all real numbers	π	PYTHAGOREAS $\sin^2 x + \cos^2 x = 1$ $1 + \cot^2 x = \csc^2 x$ $1 + \tan^2 x = \sec^2 x$ COFACTOR IDENTITIES $\sin(x + \frac{\pi}{2}) = \cos x$ $\cos(x + \frac{\pi}{2}) = -\sin x$
cosecant (odd fn)		all real numbers except $k\pi$	$(-\infty, -1] \cup [1, \infty)$	2π	 Signs of Trig Functions even: $f(x) = f(-x)$ odd: $f(-x) = -f(x)$
secant (even fn)		all real numbers except $\frac{\pi}{2} + k\pi$	$(-\infty, -1] \cup [1, \infty)$	2π	 SPECIAL TRIANGLES Quadrant 2: sin, csc are + Quadrant 3: tan, cot are + Quadrant 4: cos, sec are + Quadrant 1: all are + Right triangles with angles 30°, 45°, 60° and their corresponding side ratios.
cotangent (odd fn)		all real numbers except $k\pi$	all real numbers	π	

	QUADRANT 1				QUADRANT 2				QUADRANT 3				QUADRANT 4				
degrees θ	0°	30°	45°	60°	90°	120°	135°	150°	180°	210°	225°	240°	270°	300°	315°	330°	360°
radians θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	2π
sin θ																	
cos θ																	
tan θ																	
csc θ																	
sec θ																	
cot θ																	

*** On this page, k represents any integer.