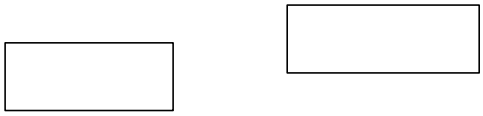
Trig Cheat Sheet

Definition of the Trig Functions

Right triangle definition

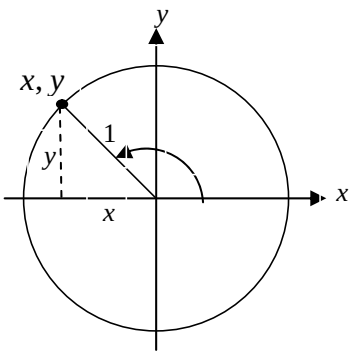
For this definition we assume that $0 < \theta < \frac{\pi}{2}$ or $0^\circ < \theta < 90^\circ$.



$\sin\theta$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\csc\theta$	$\frac{\text{hypotenuse}}{\text{opposite}}$
$\cos\theta$	$\frac{\text{adjacent}}{\text{hypotenuse}}$	$\sec\theta$	$\frac{\text{hypotenuse}}{\text{adjacent}}$
$\tan\theta$	$\frac{\text{opposite}}{\text{adjacent}}$	$\cot\theta$	$\frac{\text{adjacent}}{\text{opposite}}$

Unit circle definition

For this definition θ is any angle.



$\sin\theta$	$\frac{y}{1}$	y	$\csc\theta$	$\frac{1}{y}$	
$\cos\theta$	$\frac{x}{1}$	x	$\sec\theta$	$\frac{1}{x}$	
$\tan\theta$	$\frac{y}{x}$		$\cot\theta$	$\frac{x}{y}$	

Facts and Properties

Domain

The domain is all the values of θ that can be plugged into the function.

$\sin\theta$,	θ can be any angle
$\cos\theta$,	θ can be any angle
$\tan\theta$,	$\theta \neq n\frac{1}{2}$, $n = 0, 1, 2, \ldots$
$\csc\theta$,	$\theta \neq n$, $n = 0, 1, 2, \ldots$
$\sec\theta$,	$\theta \neq n\frac{1}{2}$, $n = 0, 1, 2, \ldots$
$\cot\theta$,	$\theta \neq n$, $n = 0, 1, 2, \ldots$

Range

The range is all possible values to get out of the function.

$-1 \leq$	$\sin\theta$	≤ 1	$\csc\theta$	≤ -1 and $1 \leq \csc\theta$	
$-1 \leq$	$\cos\theta$	≤ 1	$\sec\theta$	≤ -1 and $1 \leq \sec\theta$	
	$\tan\theta$				

Formulas and Identities

Tangent and Cotangent Identities

$\tan \quad \frac{\sin}{\cos} \qquad \cot \quad \frac{\cos}{\sin}$

Reciprocal Identities

$\csc \quad \frac{1}{\sin} \qquad \sin \quad \frac{1}{\csc}$

$\sec \quad \frac{1}{\cos} \qquad \cos \quad \frac{1}{\sec}$

$\cot \quad \frac{1}{\tan} \qquad \tan \quad \frac{1}{\cot}$

Pythagorean Identities

$\sin^2 \quad \cos^2 \quad 1$

$\tan^2 \quad 1 \quad \sec^2$

$1 \quad \cot^2 \quad \csc^2$

Even/Odd Formulas

$\sin \qquad \sin \qquad \csc \qquad \csc$

$\cos \qquad \cos \qquad \sec \qquad \sec$

$\tan \qquad \tan \qquad \cot \qquad \cot$

Periodic Formulas

If n is an integer.

$\sin \quad 2 \ n \quad \sin \qquad \csc \quad 2 \ n \quad \csc$

$\cos \quad 2 \ n \quad \cos \qquad \sec \quad 2 \ n \quad \sec$

$\tan \quad n \quad \tan \qquad \cot \quad n \quad \cot$

Double Angle Formulas

$\sin \ 2 \qquad 2\sin \quad \cos$

$\cos \ 2 \qquad \cos^2 \quad \sin^2$

$2\cos^2 \quad 1$

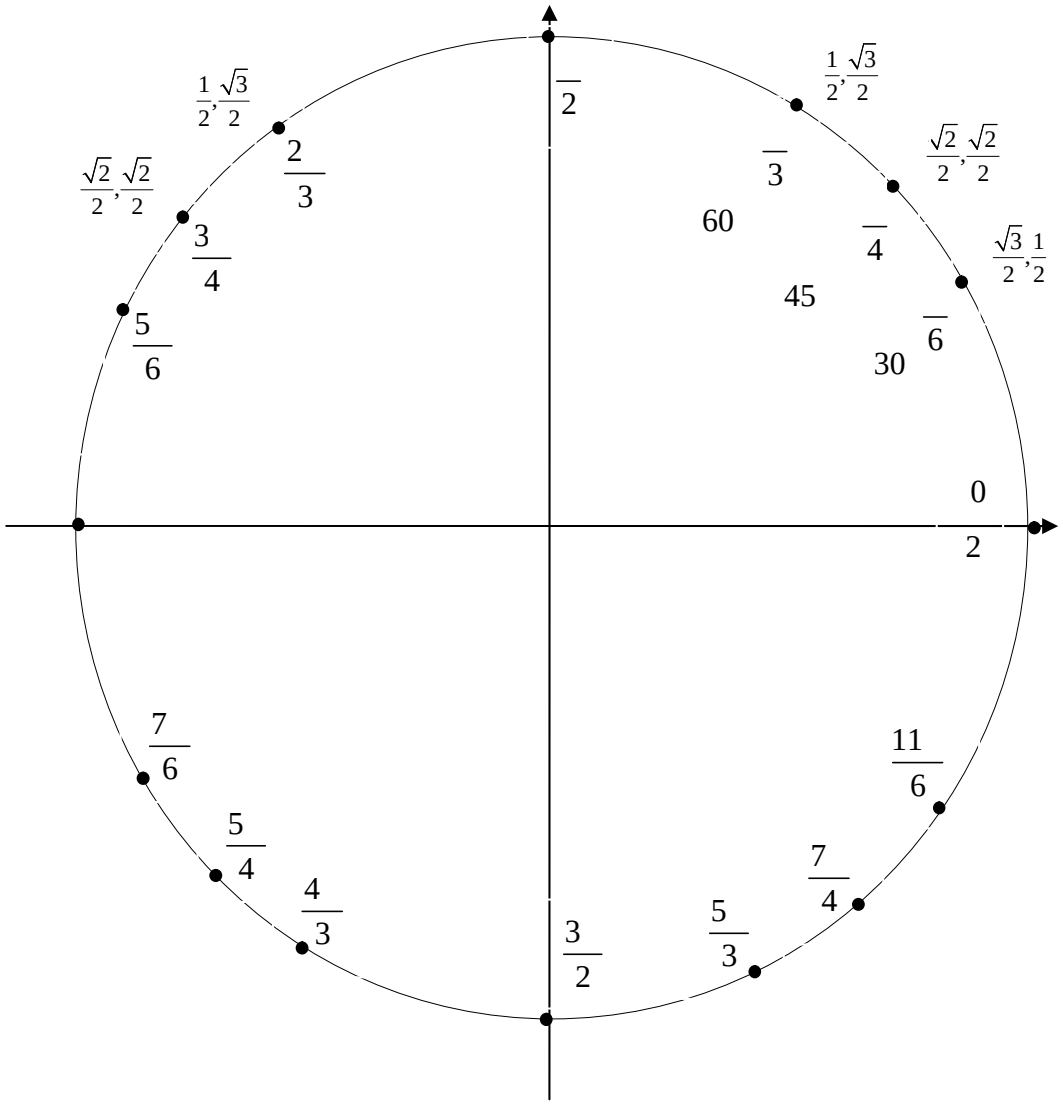
$1 \quad 2\sin^2$

$\tan \ 2 \qquad \frac{2\tan}{1 \quad \tan^2}$

Degrees to Radiant54 4SL5/TT2 1Tf0 04 Tm 4 Tc (24 Tc (2 3 Dn d TT6 and t 4 4 S E D] T Tw Double Anglt 0 4 Tm 4 (2

h±A±A

Unit Circle



For any ordered pair on the unit circle x, y : cos x and sin y

Example

$$\cos\frac{5}{3}\quad\frac{1}{2}\qquad\sin\frac{5}{3}\quad\frac{\sqrt{3}}{2}$$