

# College Algebra Trigonometry

College Algebra Core Concept Cheat Sheet

## 22: Trigonometry

**Key Geometry and Trigonometry Terms**

- Degree** - unit of angle measurement equal to  $1/360$  of a circle's circumference.
- Radian** - unit of angle measurement that is the ratio of the circle arc cut off by an angle to the central angle.
- Sine** - on a unit circle, the "y" coordinate for any intersection between a standard angle and the circle. In a right triangle, the ratio of the length of the opposite side to the length of the hypotenuse.
- Cosine** - on a unit circle, the "x" coordinate for any intersection between a standard angle and the circle. In a right triangle, the ratio of the length of the adjacent side to the length of the hypotenuse.
- Tangent** - the ratio of sine to cosine or, in a right triangle, the ratio of the length of the opposite side to the length of the adjacent side.
- Secant** - reciprocal of cosine ( $\sec \theta = 1 / \cos \theta$ ).
- Cosecant** - reciprocal of sine ( $\csc \theta = 1 / \sin \theta$ ).
- Cotangent** - reciprocal of tangent ( $\cot \theta = 1 / \tan \theta$ ).
- General Form of a Trig Function** - trig functions take the form  $y = A \cdot f(Bx + C) + D$  where A, B, C, and D are coefficients that change the characteristics of that trig function.

**Common Trig Function Values**

Angle in Degrees	Angle in Radians	Sine	Cosine	Tangent	Secant	Cosecant	Cotangent
0	0	0	1	0	1	1	∞
30	$\pi/6$	$1/2$	$\sqrt{3}/2$	$1/\sqrt{3}$	$\sqrt{3}$	2	$\sqrt{3}$
45	$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1	1	$\sqrt{2}$	1
60	$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$	$1/\sqrt{3}$	2	$1/\sqrt{3}$
90	$\pi/2$	1	0	∞	0	1	0
180	$\pi$	0	-1	0	-1	-1	∞

**Degrees and Radians**

Common Angles in Both Degrees and Radians

Angle in Degrees	Angle in Radians
0	0
30	$\pi/6$
45	$\pi/4$
60	$\pi/3$
90	$\pi/2$
180	$\pi$

Converting Between Degrees and Radians

using the fact that  $180^\circ = \pi$  radians

Convert  $20^\circ$  to radians:  $20 \cdot \frac{\pi}{180} = \frac{\pi}{9}$

Convert  $\pi/3$  radians to degrees:  $\frac{\pi}{3} \cdot \frac{180}{\pi} = 60^\circ$

**Trig Functions: Sine**

Definition for a Sine Function:  $y = \sin x$

Graph of  $y = \sin x$  showing the sine wave. The x-axis is labeled with  $0, \pi, 2\pi$  and the y-axis with  $-1, 1$ .

Important traits for  $y = \sin x$ :

- Domain: All real nos.
- Range:  $[-1, 1]$
- Repeats every  $2\pi$  over the entire x axis

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