

Trigonometric Ratios

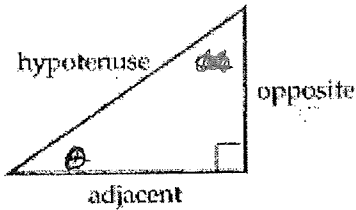


Figure 6.1-6

For a given acute angle θ in a right triangle:

The *sine* of θ , written as $\sin \theta$, is the ratio

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}} \quad \text{CSC}$$

The *cosine* of θ , written as $\cos \theta$, is the ratio

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}} \quad \text{SEC}$$

The *tangent* of θ , written as $\tan \theta$, is the ratio

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}} \quad \text{COT}$$

In addition, the reciprocal of each ratio above is also a trigonometric ratio.

cosecant of θ

secant of θ

cotangent of θ

$$\csc \theta = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\sec \theta = \frac{\text{hypotenuse}}{\text{adjacent}}$$

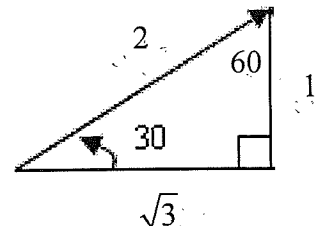
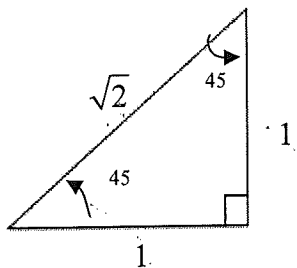
$$\cot \theta = \frac{\text{adjacent}}{\text{opposite}}$$

$$= \frac{1}{\sin \theta}$$

$$= \frac{1}{\cos \theta}$$

$$= \frac{1}{\tan \theta}$$

NOTE The Greek letter θ (theta) is commonly used to label the measure of an angle in trigonometry.



$\sin 45 = \frac{1}{\sqrt{2}}$	$\sin 30 = \frac{1}{2}$	$\sin 60 = \frac{\sqrt{3}}{2}$
$\cos 45 = \frac{1}{\sqrt{2}}$	$\cos 30 = \frac{\sqrt{3}}{2}$	$\cos 60 = \frac{1}{2}$
$\tan 45 = \frac{1}{1}$	$\tan 30 = \frac{1}{\sqrt{3}}$	$\tan 60 = \frac{\sqrt{3}}{1}$
$\csc 45 = \frac{\sqrt{2}}{1}$	$\csc 30 = \frac{2}{1}$	$\csc 60 = \frac{2}{\sqrt{3}}$
$\sec 45 = \frac{\sqrt{2}}{1}$	$\sec 30 = \frac{2}{\sqrt{3}}$	$\sec 60 = \frac{2}{1}$
$\cot 45 = \frac{1}{1}$	$\cot 30 = \frac{\sqrt{3}}{1}$	$\cot 60 = \frac{1}{\sqrt{3}}$

Part 1: Complete the unit circle. Identify each angle measure and ordered pair for each point along the circle.

