

Introduction to Trigonometry

OBJECTIVES:

1. Find the ratios, sine, cosine, and tangent given a right triangle and an angle, theta.
2. Solve a right triangle given an angle and at least one side.
3. Know the trig values for the special angles: 30, 45, 60 degrees.
4. Be able to fill in completely a Unit Circle.
5. Be able to use coordinates of the unit circle to find the trig values for the angle associated with each point.
6. Solve right triangle trig applications.
7. Convert between degrees and radians
8. Relating trigonometry and the Coordinate Plane

Right Triangle Trig

Given the following triangle, state the trigonometric values for both α and β .

$\sin \alpha$

$\cos \alpha$

$\tan \alpha$

$\sin \beta$

$\cos \beta$

$\tan \beta$

Solve the following Right Triangle Problems.

1. Given a right triangle with legs 12 and 18 and angles α , and β , Find sine, cosine, and tangent for both α and β .
2. Given a right triangle with angle θ and $\cos \theta = \frac{5}{13}$, find $\sin \theta$ and $\tan \theta$
3. Given a right triangle with $\theta = 43$ degrees and opposite leg 12 inches. What are the three trig values in terms of θ ?

Constructions of our Special Triangles

Construct an equilateral triangle with sides of length 1 unit.

Construct an equilateral triangle with sides of length 1 unit.

Construct a square with sides of length 1 unit

Fill in the following table

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
0			
30			
45			
60			
90			

What is the definition of the sine function in terms of a point (x, y) on the unit circle?

What is the definition of the cosine function in terms of a point (x, y) on the unit circle?

Illustrate both definitions on a sketch of a unit circle

Fill in the following table

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
120			
135			
150			
180			
210			
225			
240			
270			
300			
315			
330			
360			

Some Definitions

1. Standard position of an angle
2. Terminal side of rotated ray
3. Radian

Converting between degrees and radians

1. 220°
2. 112°
3. -34°
4. 45°

Converting between radians and degrees

1. $\frac{\pi}{3}$
2. $-\pi$
3. $\frac{2\pi}{3}$
4. 2

INTERESTING PROBLEMS

1. What is the range of the sine function? What is the domain of the cosine function?
2. What is $\sin(750)$ (angle in degrees)

NOTES: