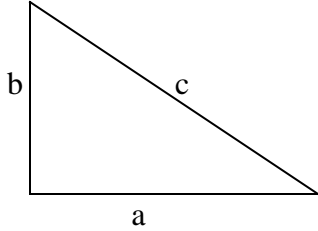


Math 108 Exam #1

Find the exact values of all trigonometric functions of θ if $c = 4$ and $\sin(\theta) = 1/4$.



Find the exact values of all trigonometric functions of an angle θ in standard position if the terminal side of the angle goes through the point $(2, -3)$.

Find the exact values of all trigonometric functions of θ if $\cos(\theta) = -3/7$ and $180^\circ < \theta < 270^\circ$.

Find the reference angles for the given angles in standard position.

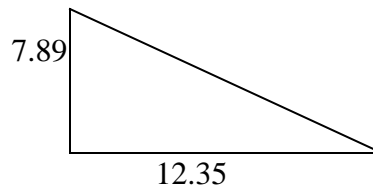
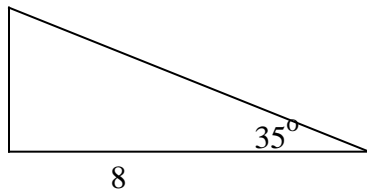
- (a) 135° (b) -245° (c) 999° (d) -1223°

Find the exact values of all trigonometric functions of the angle θ if the sine of the reference angle of θ is the same as the sine of the angle θ and $\cos(\theta) = -1/2$.

Find the area, to the nearest square mile, of the Bermuda Triangle if the sides of the triangle have lengths of 846 miles, 925 miles and 1306 miles, and the largest angle in this triangle is 95° .

$\tan(\theta)/\sec(\theta) + \cot(\theta)\cos(\theta)$ is equal to what single trigonometric function of θ ?

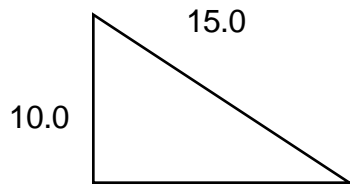
Solve the right triangles. Round your answers to two decimal places.



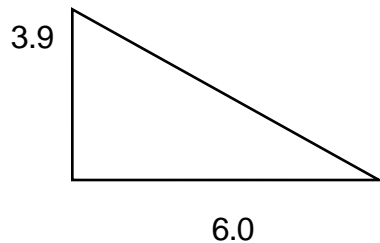
A surveyor is measuring the distance across a river that has uniform width. A transit is set up on the same side of the river 100 feet down stream from a piling that is directly across from a pier on the other side. From the transit, the angle between the two lines of sight to the piling and the pier is 40° . To the nearest foot, how wide is the river?

A building 210 feet tall casts a 60 feet long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of elevation of the person's line of sight to the top of the building if the person's eyes are 6 feet above the ground?

Solve the right triangle using degrees and two decimal places.



Solve the right triangle using degrees and two decimal places.



A person measures the shadow of a flagpole to be 18 feet when the angle of elevation of the sun is 35° . Calculate the height of the flagpole.

An engineer wishes to know the width of a river walks 100 yards downstream from a point that is directly across from a tree on the opposite bank. If the angle between the riverbank and the line of sight to the tree at this second point is 50.8° , what is the width of the river at the original point directly across from the tree?

Six holes are to be drilled in a circular cover plate of a rocket motor. The holes are to be equally spaced on a circle of radius 5 in. What is the straight-line distance between any two adjacent holes?

You are 30 feet away from a large cylindrical oil storage tank with a circular base and top. At ground level, you sight directly at the middle of the part of the tank which you can see. Then you sight to the edge of the tank where it disappears from view. The angle between these two lines of sight is 40° . What is the radius of the tank to two decimal places?

Given the indicated parts of right triangle ABC with $C = 90^\circ$, find the exact values of the remaining parts

if $A = 60^\circ$ and $c = 6$

if $b = 7\sqrt{2}$ and $c = 14$

Given the indicated parts of right triangle ABC with $C = 90^\circ$, find approximate values for the remaining parts to three decimal places

if $A = 31^\circ 10'$ and $a = 510$

if $a = .42$ and $c = .68$

A guy wire is attached to the top of a radio antenna and to a point on horizontal ground 40 meters from the base of the antenna. If the wire makes an angle of $58^\circ 20'$ with the ground, find the length of the wire to eight decimal places.

An airplane takes off at a 10° angle and travels at the rate of 250 ft/sec. How long does it take the airplane to reach an altitude of 15,000 feet? Write your answer in minutes and seconds, like 14 minutes and 37 seconds. Use one decimal place.

A builder wishes to construct a ramp with a surface which is 24 feet long and which rises to a height of 5 feet above the level ground. What is the angle that the ramp should make with the ground? Use three decimal places.

From a point that is 8.2 meters above level ground, the angle of elevation of the top of a building is $31^{\circ}20'$ and the angle of depression of the base of the building is $12^{\circ}50'$. Find the height of the building. Use three decimal places.

An antenna is located on the corner of the top of a garage that is 16 feet tall. From a point on level ground 100 feet from the base of the same corner of the garage, the antenna subtends an angle of 12° . Find the length of the antenna to three decimal places.

A motorist traveling along a level highway at a speed of 60 miles per hour directly toward a mountain observes that between 1:00 pm and 1:15 pm the angle of elevation of the top of the mountain changes from 10° to 70° . Find the height of the mountain to the nearest foot.

Reduce each expression to a single trigonometric function.

$$\cos(x)\csc(x)$$

$$[\cos^2(x) - 1][\tan^2(x) + 1]$$

$$\frac{\sec(x) - \cos(x)}{\tan(x)}$$

$$[\tan(x)][\sin(x) + \cot(x) \cos(x)]$$

$$\frac{\tan(x) \sin(x)}{\sec^2(x) - 1}$$