

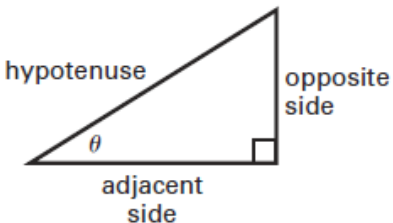
13.1	Right Triangle Trigonometry
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Objectives

1. Use trigonometric relationships to evaluate trigonometric functions of acute angles.
2. Use trigonometric functions in real-life problems.

RIGHT TRIANGLE DEFINITION OF TRIGONOMETRIC FUNCTIONS

Let θ be an acute angle of a right triangle. The six trigonometric functions of θ are defined as follows.



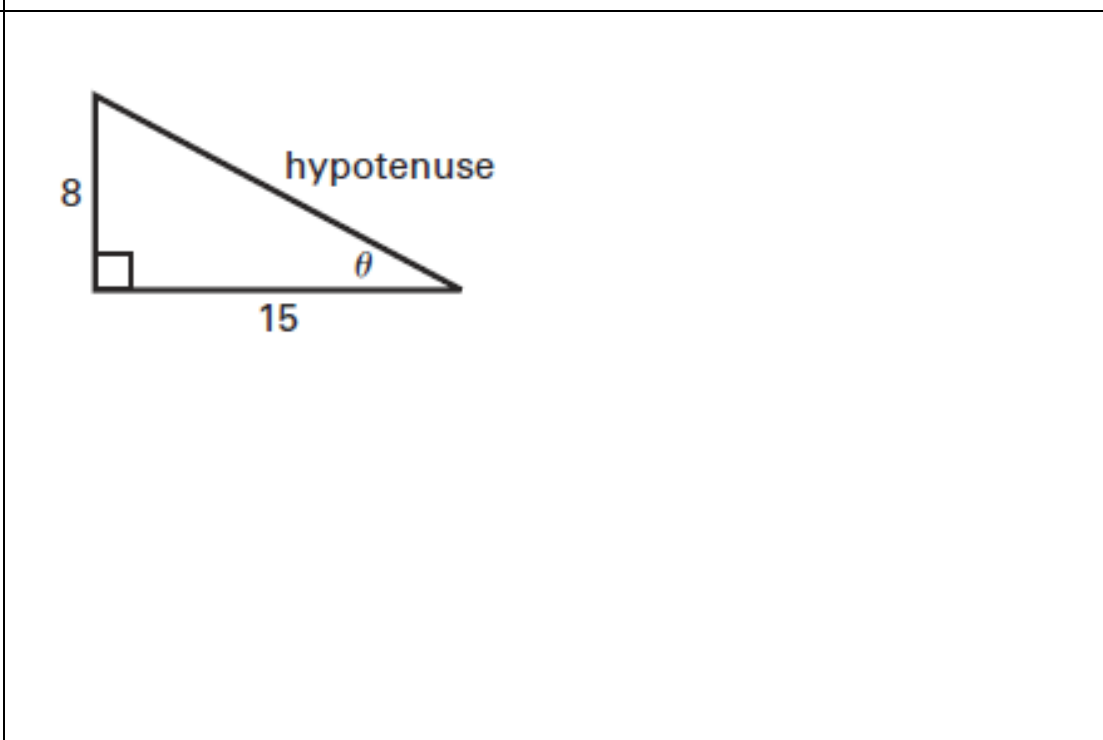
The abbreviations *opp*, *adj*, and *hyp* represent the lengths of the three sides of the right triangle. Note that the ratios in the second row are the reciprocals of the ratios in the first row.

$$\sin \theta = \frac{opp}{hyp} \quad \cos \theta = \frac{adj}{hyp} \quad \tan \theta = \frac{opp}{adj}$$

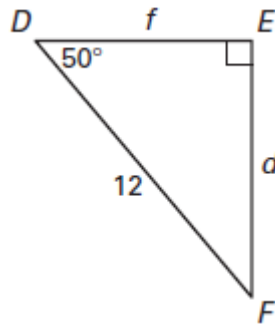
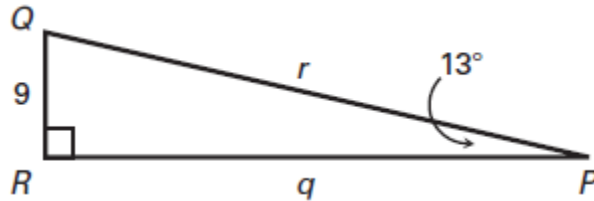
$$\csc \theta = \frac{hyp}{opp} \quad \sec \theta = \frac{hyp}{adj} \quad \cot \theta = \frac{adj}{opp}$$

$$\csc \theta = \frac{1}{\sin \theta} \quad \sec \theta = \frac{1}{\cos \theta} \quad \cot \theta = \frac{1}{\tan \theta}$$

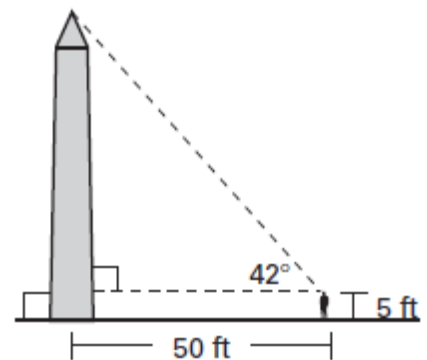
Evaluate the six trigonometric functions of the angle θ shown in the right triangle.



Find the missing lengths of the sides of the right triangle and the missing angle. Round answers to the nearest hundredth.

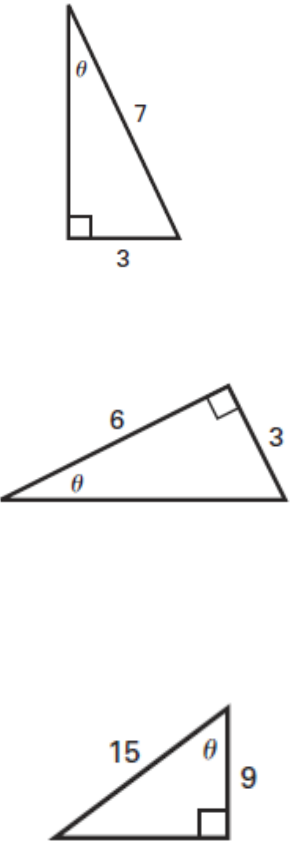


You are standing 50 feet from the base of a monument. The angle formed by the ground and your line of sight to the top of the monument is 42° . How tall is the monument? Assume that your height is 5 feet.

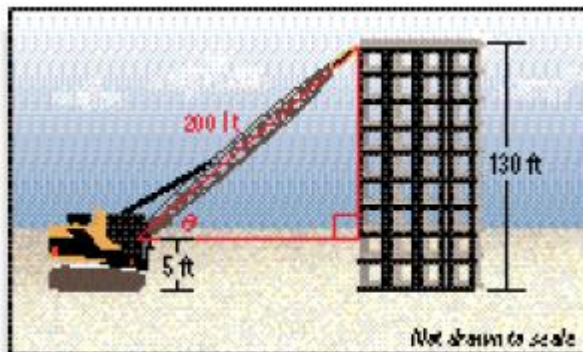


Assignment

Read pages 769-771
Complete Page 772-774 #15, 17, 19, 25-36, 45-50

13.4	Inverse Trigonometric Functions
Objectives	<ol style="list-style-type: none"> Evaluate inverse trigonometric functions. Use inverse trigonometric functions to solve real life problems.
	<p>Inverse Trigonometric Functions Inverse trigonometric functions find the angles that correspond to the given trigonometric ratio.</p> $\sin^{-1} a = \theta \qquad \cos^{-1} a = \theta \qquad \tan^{-1} a = \theta$
Evaluate the expression in degrees.	$\sin^{-1} \frac{1}{2} \qquad \cos^{-1} 2 \qquad \tan^{-1} \frac{\sqrt{2}}{2}$
Find the measure of the angle θ for the triangle shown.	 <p>The first triangle is a right-angled triangle with a right angle at the bottom-left. The vertical side is labeled θ, the horizontal side is labeled 3, and the hypotenuse is labeled 7.</p> <p>The second triangle is a right-angled triangle with a right angle at the top-right. The left side is labeled 6, the right side is labeled 3, and the angle at the bottom-left is labeled θ.</p> <p>The third triangle is a right-angled triangle with a right angle at the bottom-right. The vertical side is labeled 9, the hypotenuse is labeled 15, and the angle at the top-right is labeled θ.</p>

A crane has a 200 foot arm whose lower end is 5 feet off the ground. The arm had to reach the top of a building 130 feet high. At what angle θ should the arm be set?



Assignment

Read pages 793-794

Complete Pages 795-796 #18-38, 52-56 Calculator must be in degree mode. Find all angles in degrees.