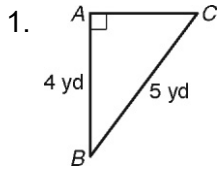


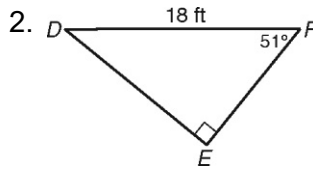
Problem Solving with Trigonometry

Practice and Problem Solving: A/B

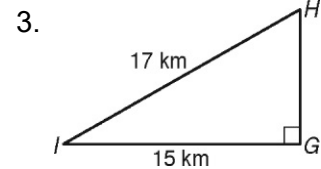
Find the following. Round lengths to the nearest hundredth and angle measures to the nearest degree.



$AC =$
 $m\angle B =$
 $m\angle C =$



$DE =$
 $EF =$
 $m\angle D =$



$GH =$
 $m\angle H =$
 $m\angle I =$

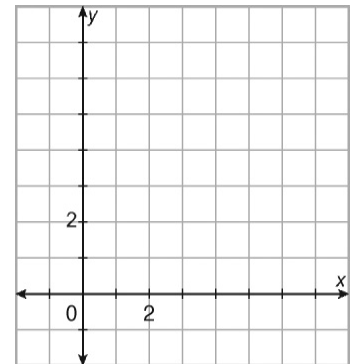
$\triangle XYZ$ has vertices $X(6, 6)$, $Y(6, 3)$, and $Z(1, 3)$. Complete Problems 4–6 to find the side lengths to the nearest hundredth and the angle measures to the nearest degree.

- Plot the points and draw $\triangle XYZ$
- Find XY and YZ from the graph. Use the Pythagorean Theorem to find XZ .

$XY =$ $YZ =$ $XZ =$

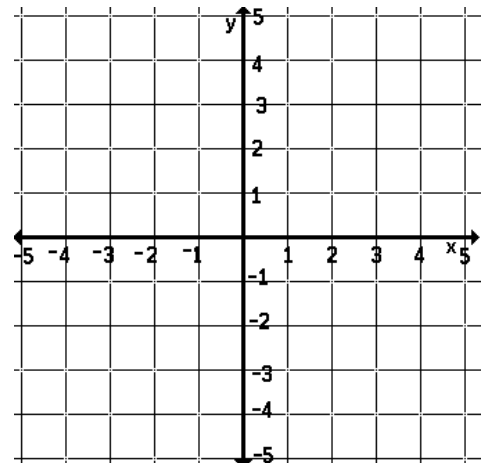
- Find the angle measures.

$m\angle X$ $m\angle Z$

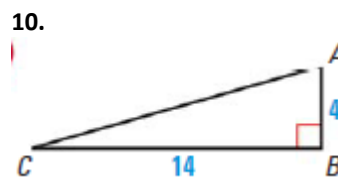
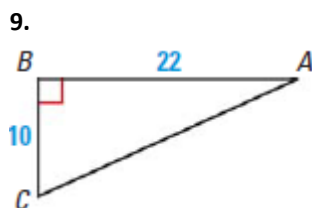
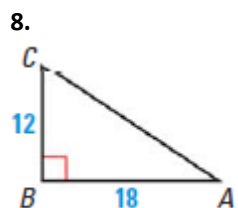


For each triangle, find all three side lengths to the nearest hundredth and all three angle measures to the nearest degree.

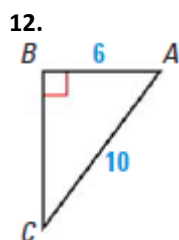
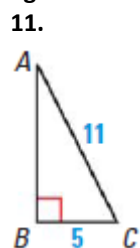
- $B(-2, -4)$, $C(3, 3)$, $D(-2, 3)$



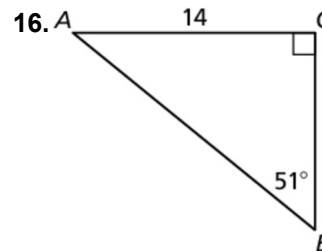
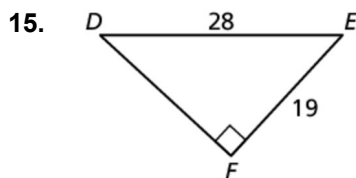
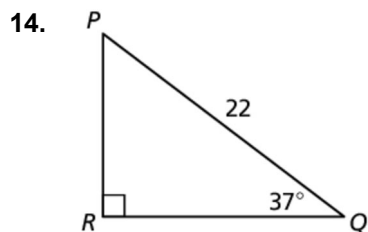
INVERSE TANGENTS Use a calculator to approximate the measure of A to the nearest tenth of a degree.



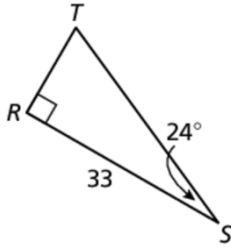
INVERSE SINES AND COSINES Use a calculator to approximate the measure of $\angle A$ to the nearest tenth of a degree.



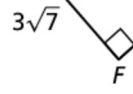
In Exercises 14 – 24, find all unknown sides and angles. Round decimal answers to the nearest tenth.



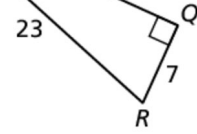
17.



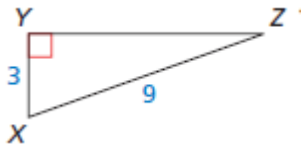
18. D 12 E



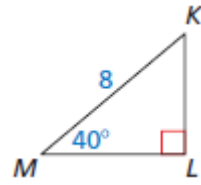
19. P



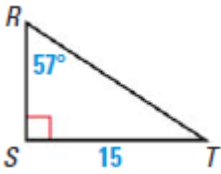
20.



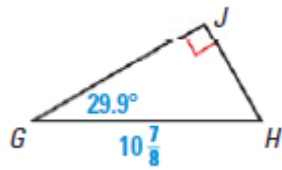
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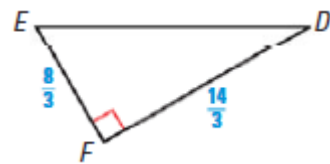
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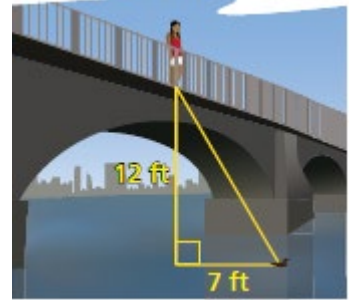
23.



24.



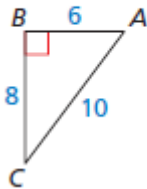
26. You are standing on a footbridge that is 12 feet above a lake. You look down and see a duck in the water. The duck is 7 feet away from the footbridge. What is the angle of elevation from the duck to you?



In Exercises 27 - 28, determine which of the two acute angles has the given trigonometric ratio.

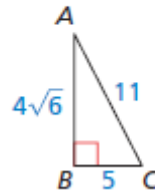
27.

The cosine of the angle is $\frac{4}{5}$.



28.

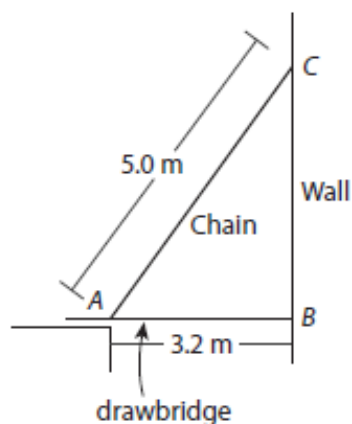
The sine of the angle is $\frac{5}{11}$.



29. A soccer ball is placed 10 feet away from the goal, which is 8 feet high. You kick the ball and it hits the crossbar along the top of the goal. What is the angle of elevation of your kick?



- 10. History** A drawbridge at the entrance to an ancient castle is raised and lowered by a pair of chains. The figure represents the drawbridge when flat. Find the height of the suspension point of the chain, to the nearest tenth of a meter, and the measures of the acute angles the chain makes with the wall and the drawbridge, to the nearest degree.

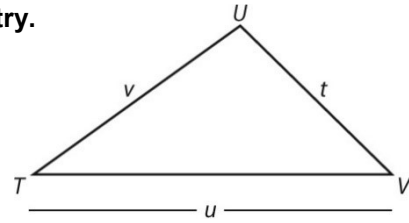


- 11. Building** For safety, the angle a wheelchair ramp makes with the horizontal should be no more than 3.5° . What is the maximum height of a ramp of length 30 ft? What distance along the ground would this ramp cover? Round to the nearest tenth of a foot.



Follow the steps to find the area of the triangle using trigonometry.

33. Draw a line from vertex U perpendicular to the base \overline{TV} at a point W . Label its length h . Write the sine of $\angle T$ as a ratio using variables in the figure. Solve for h . Then write the area of the triangle using your value for h .



$$\sin T = \frac{\boxed{}}{\boxed{}} \quad h = \quad \text{Area} =$$

$$\text{Area of a triangle} = \frac{1}{2} \text{ base} \times \text{height}$$

34. What is the area of the triangle if $\angle T = 37^\circ$, $u = 14$, and $v = 10$?

Solve each triangle. Find the side lengths to the nearest hundredth and the angle measures to the nearest degree.

6. Triangle ABC with vertices $A(-4, 4)$, $B(3, 4)$, and $C(3, -2)$

