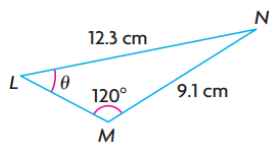
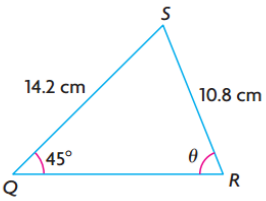
Sine Law and Cosine Law Applications Homework

1. Determine the measure of angle θ to the nearest degree.

a)

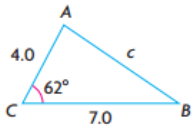


b)

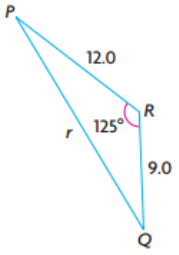


2. Determine each unknown side length to the nearest tenth.

a)

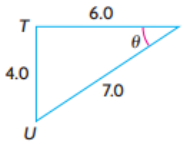


b)

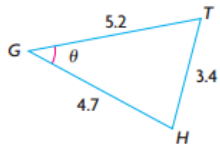


3. For each triangle, determine the value of θ to the nearest degree.

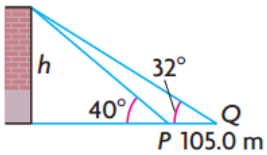
a)



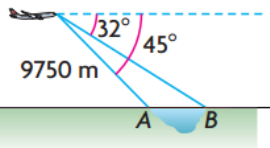
b)



4. A building of height h is observed from two points, P and Q, that are 105.0 m apart as shown. The angles of elevation at P and Q are 40° and 32°, respectively. Calculate the height, h, to the nearest tenth of a metre.

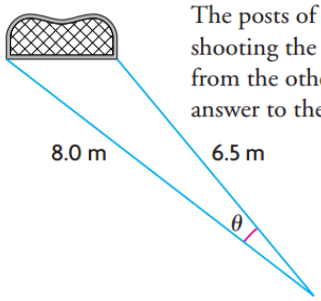


5. A surveyor in an airplane observes that the angle of depression to two points on the opposite shores of a lake are 32° and 45°, respectively, as shown. What is the width of the lake, to the nearest metre, at those two points?

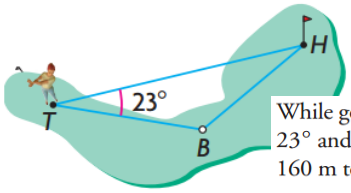


6. The Pont du Gard near Nîmes, France, is a Roman aqueduct. An observer in a hot-air balloon some distance away from the aqueduct determines that the angle of depression to each end is 54° and 71°, respectively. The horizontal distance between the balloon and the aqueduct is 270.0 m. Calculate the length of the aqueduct to the nearest tenth of a metre.

7. The trunk of a leaning tree makes an angle of 12° with the vertical. To prevent the tree from falling over, a 35.0 m rope is attached to the top of the tree and is pegged into level ground some distance away. If the tree is 20.0 m from its base to its top, calculate the angle the rope makes with the ground to the nearest degree.

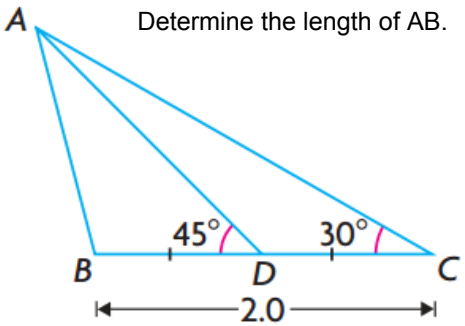
8. 

The posts of a hockey goal are 2.0 m apart. A player attempts to score by shooting the puck along the ice from a point 6.5 m from one post and 8.0 m from the other. Within what angle θ must the shot be made? Round your answer to the nearest degree.

9. 

While golfing, Sahar hits a tee shot from T toward a hole at H, but the ball veers 23° and lands at B. The scorecard says that H is 270 m from T. If Sahar walks 160 m to the ball (B), how far, to the nearest metre, is the ball from the hole?

10. Determine the length of AB.



11. The interior angles of a triangle are 120°, 40°, and 20°. The longest side is 10 cm longer than the shortest side. Determine the perimeter of the triangle to the nearest centimetre.

12. Two hot-air balloons are moored to level ground below, each at a different location. An observer at each location determines the angle of elevation to the opposite balloon as shown at the right. The observers are 2.0 km apart.

a) What is the distance separating the balloons, to the nearest tenth of a kilometre?

b) Determine the difference in height (above the ground) between the two balloons. Round your answer to the nearest metre.