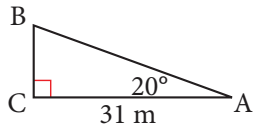
1 Review

1.1 Primary Trigonometric Ratios, pages 6–15

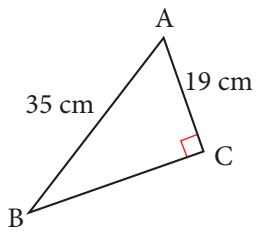
Where necessary, round answers to the nearest tenth.

1. Solve the right triangles.

a)



b)



2. Solve $\triangle ABC$ where $\angle C = 90°$, $a = 15$ cm, and $b = 7$ cm.

3. Is it possible to solve $\triangle ABC$, given $\angle C = 90°$ and $c = 35$ cm? Explain. If not, what additional information is necessary?

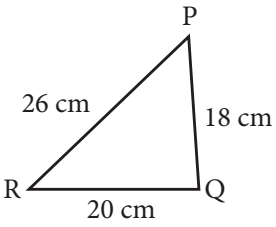
1.2 Solve Problems Using Trigonometric Ratios, pages 16-23

4. A communication tower casts a shadow of 55 m when the sun is at an angle of elevation of 72°. What is the height of the tower to the nearest metre?

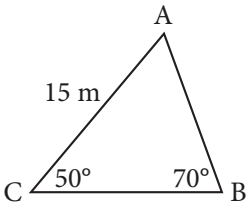
5. A person walks 5 km north, turns east, and then walks another 6 km. At what angle, east of north, did the person stop?

1.3 The Sine Law, pages 24-33

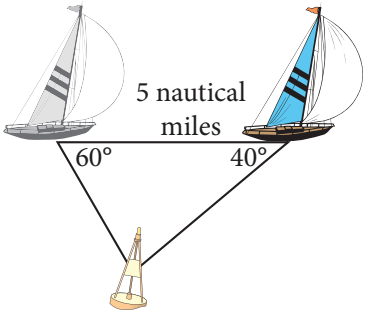
6. Is it possible to solve the triangle using the sine law? Explain. If not, what information is required?



7. Solve the triangle.

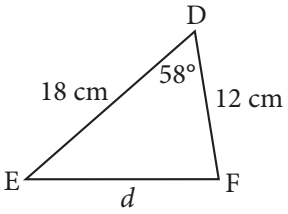


8. A sailboat is 5 nautical miles east of its starting point. At the start of its journey, it made an angle of 60° with a buoy on the right side of its path. After 45 min, it made an angle of 40° with the buoy as shown. How far is the sailboat from the buoy after 45 min?



1.4 The Cosine Law, pages 34-41

9. Find the length of the unknown side, d.

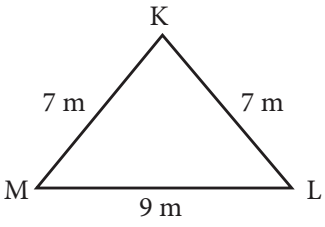


10. What information must be known about a triangle to use the cosine law? Provide examples with diagrams to help you explain.

11. Create a question with a triangle that can be solved using the cosine law. Trade problems with a classmate and solve each other's questions.

12. Two cyclists leave from the same location with an angle of 63° between their paths. Johal cycles at a speed of 35 km/h and Julio at a speed of 40 km/h. How far apart are they after 3 h?

13. Solve $\triangle KLM$ using the cosine law.

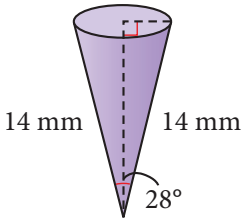


1.5 Make Decisions Using Trigonometry, pages 42-51

14. The pitch of a roof is 45°. The rise of the roof is 12 ft. A carpenter decided to cut a roof rafter 20 ft long to allow for a 1-ft overhang. Did the carpenter cut the correct length for the rafter? Explain. Draw a diagram and show your work. Include the formulas that you use.

15. The posts of a hockey goal are 2.0 m apart. Leah is 3.8 m from one post and 4.2 m from the other post. Within what angle must she shoot the puck to score a goal?

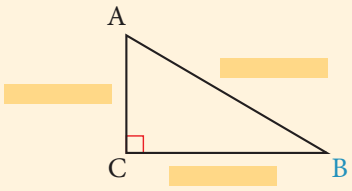
16. Determine the radius of the cone.



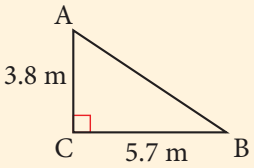
17. How can you solve the triangle in question 6 if it is not possible to solve it using the sine law? Solve it.

1 Practice Test

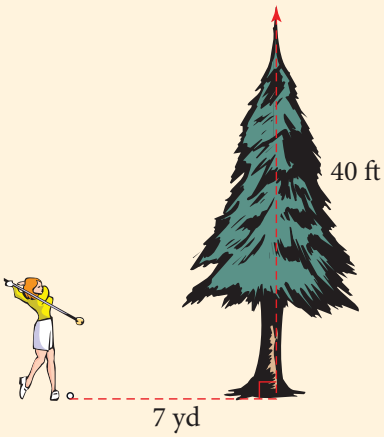
1. Copy and complete the diagram. Name the sides of the right triangle associated with ∠B, as adjacent, opposite, or hypotenuse.



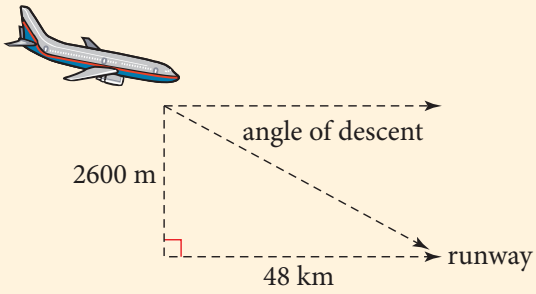
2. Solve △ABC.



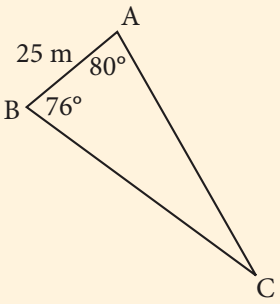
3. A golfer hit her tee shot so that it landed about 7 yd behind a 40-ft tall pine tree as shown. She decided to take her second shot and hoped the ball would make it over the top of the tree. She used her lob wedge and hit the ball, sending it upward at an angle of 60°. Was she able to clear the top of the tree? Show your solution.



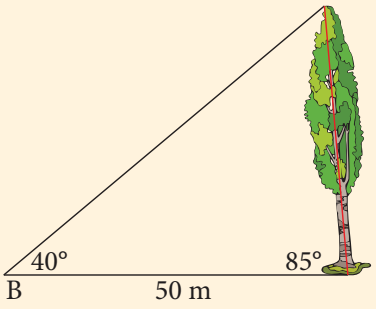
4. An airplane flying at an altitude of 2600 m is approaching an airport runway located 48 km away. Calculate the airplane's angle of descent. Round your answer to the nearest tenth of a degree.



5. Solve △ABC.



6. A wind-swept tree grows at angle of 85°. An environmental scientist wants to know the height of the tree. She walks 50 m from the tree and measures an angle of 40° to the top of the tree. How tall is the tree?



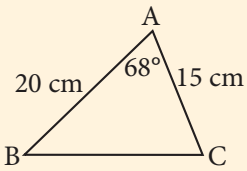
Chapter Problem Wrap-Up

The expedition team set out from the city of Iqaluit on a course 5° east of north and set up camp 15 km from their starting point. The next day, the team set out on a course 25° east of north but encountered a blizzard in the evening. They decided to set up camp until the storm subsided. They estimated that they had travelled at 2 km/h for 8 h. Not knowing their position, they radioed for help.

a) Draw a diagram to show the route travelled by the team. Include distances and angle directions.

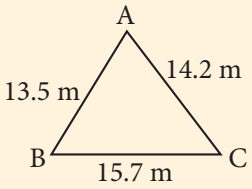
b) Determine the shortest distance and direction a rescue team from Iqaluit would have to travel to reach the team.

7. Solve $\triangle ABC$.



8. While on a camping trip, Claire hung her food bag up to keep it away from the wildlife. The bag was 6 m above the ground, suspended from the middle of a 6.2-m length of rope between two branches that are at the same height and 4 m apart. What angle did the rope make at the point where the food bag was hung?

9. Determine the measures of $\angle A$, $\angle B$, and $\angle C$.



10. **a)** Explain why it is possible to solve a right triangle using the sine law if the measures of one side and one angle are given. Is this the best method? Why or why not?

b) Is it possible to solve a right triangle using the cosine law? Explain.