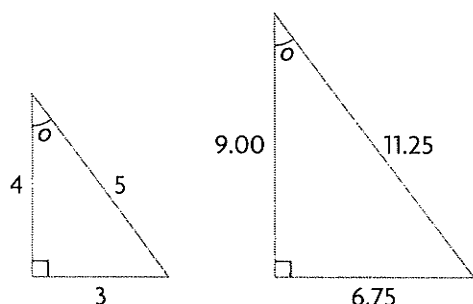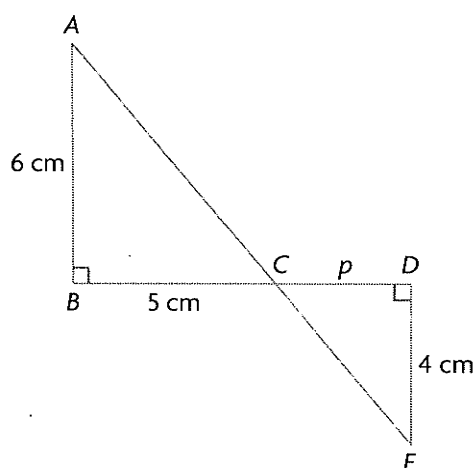# PRACTICE Questions

Lesson 7.1

1. Determine whether these triangles are similar. If they are similar, write a proportion statement and determine the scale factor.
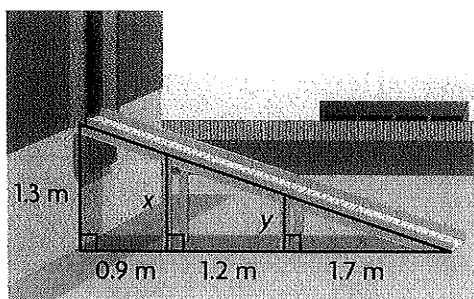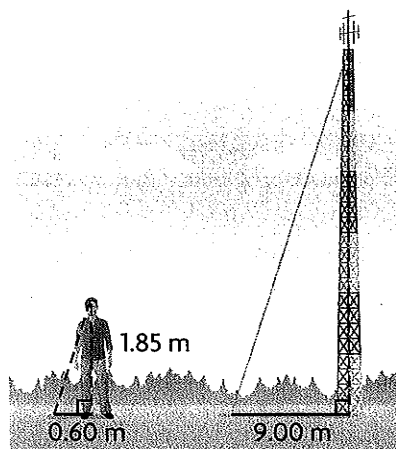

Lesson 7.2

2. State whether the triangles in the diagram are similar. Then determine p.

3. Calculate the heights of the two ramp supports, x and y. Round your answers to the nearest tenth of a metre.
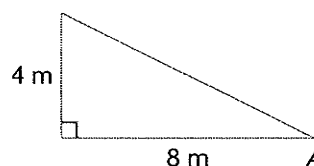

4. Brett needs to support a radio tower with guy wires. Each guy wire must run from the top of the tower to its own anchor 9.00 m from the base of the tower. When the tower casts a shadow that is 9.00 m long, Brett's shadow is 0.60 m long. Brett is 1.85 m tall. What is the length of each guy wire that Brett needs?

Lesson 7.4

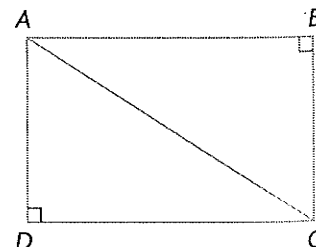5. a) Determine the three primary trigonometric ratios for $\angle A$.

   b) Calculate the measure of $\angle A$ to the nearest degree.

6. Determine x to one decimal place.

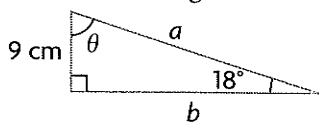   a) $\tan 46° = \dfrac{x}{14.2}$ b) $\cos 29° = \dfrac{17.3}{x}$

Lesson 7.5

7. $ABCD$ is a rectangle with $AB = 15$ cm and $BC = 10$ cm. What is the measure of $\angle BAC$ to the nearest degree?

8. In $\triangle PQR$, $\angle R = 90°$ and $p = 12.0$ cm.
  a) Determine r, when $\angle Q = 53°$.
 **b)** Determine $\angle P$, when $q = 16.5$ cm.

9. Solve this triangle.

9 cm | θ ___ a ___ 18° — b

10. Maria needs to load cars onto a transport truck. She is planning to drive up a ramp, onto the truck bed. The truck bed is 1.5 m high, and the maximum angle of the slope of the ramp is 35°.
  a) How far is the rear of the truck from the point where the ramp touches the ground?
  b) How long should the ramp be? Round your answer to one decimal place.

Lesson 7.6

11. A search-and-rescue airplane is flying at an altitude of 1200 m toward a disabled ship. The pilot notes that the angle of depression to the ship is 12°. How much farther does the airplane have to fly to end up directly above the ship?

12° ... 1200 m
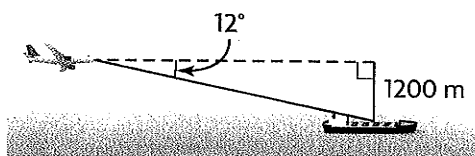
12. The angle of elevation from the top of a 16 m building to the top of a second building is 48°. The buildings are 30 m apart. What is the height of the taller building?

13. A cyclist pedals his bike 6.5 km up a mountain road, which has a steady incline. By the time he has reached the top of the mountain, he has climbed 1.1 km vertically. Calculate the angle of elevation of the road.

14. Two watch towers at an historic fort are located 375 m apart. The first tower is 14 m tall, and the second tower is 30 m tall.
  a) What is the angle of depression from the top of the second tower to the top of the first tower?
  b) The guards in the towers simultaneously spot a suspicious car parked between the towers. The angle of depression from the lower tower to the car is 7.7°. The angle of depression from the higher tower is 6.3°. Which guard is closer to the car? Explain how you know.

15. Calculate the length of AB using the information provided. Show all your steps.

A — B — 20° 20° C — 100 m — D
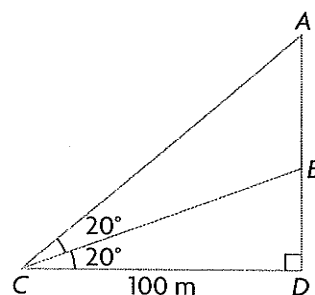
16. A swimmer observes that from point A, the angle of elevation to the top of a cliff at point D is 30°. When the swimmer swims toward the cliff for 1.5 min to point B, he estimates that the angle of elevation to the top of the cliff is about 45°. If the height of the cliff is 70.0 m, calculate the distance the swimmer swam.
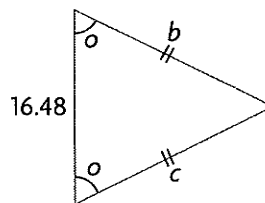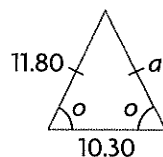
D — 70.0 m — 30° 45° — A B C
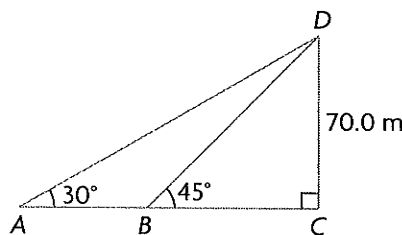
17. A plane takes off in a straight line and travels along this line for 10 s, when it reaches a height of 300 m. If the plane is travelling at 60 m/s, at what angle is the plane ascending?

1. Determine the indicated side lengths in the triangles.

2. Two trees cast a shadow when the Sun is up. The shadow of one tree is 12.1 m long. The shadow of the other tree is 7.6 m long. If the shorter tree is 5.8 m tall, determine the height of the taller tree. Round your answer to the nearest tenth of a metre.

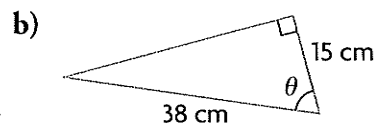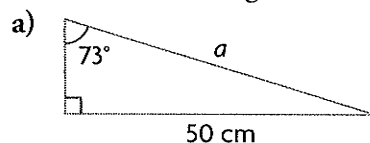**3.** Determine each unknown value. Round your answer to one decimal place.

a) $\sin 28° = \dfrac{x}{5}$

b) $\cos 43° = \dfrac{13}{y}$

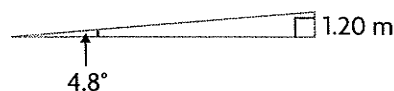c) $\tan A = 7.1154$

d) $\cos B = \dfrac{7}{9}$

4. Determine the length of the indicated side or the measure of the indicated angle.

a)

b)

5. Solve each triangle.
a) In $\triangle ABC$, $\angle A = 90°$, $\angle B = 14°$, and $b = 5.3$ cm.
b) In $\triangle DEF$, $\angle F = 90°$, $d = 7.8$ mm, and $e = 6.9$ mm.

6. A ramp has an angle of elevation of 4.8° and a rise of 1.20 m, as shown at the left. How long is the ramp and what is its run? Round your answers to the nearest hundredth of a metre.

7. Surveyors need to determine the width of a river. Explain how they can do this without crossing the river. Use a diagram to illustrate your answer.

8. Jane is on the fifth floor of an office building 16 m above the ground. She spots her car and estimates that it is parked 20 m from the base of the building. Determine the angle of depression to the nearest degree.

9. A pilot who is heading due north spots two forest fires. The fire that is due east is at an angle of depression of 47°. The fire that is due west is at an angle of depression of 38°. What is the distance between the two fires, to the nearest metre, if the altitude of the airplane is 2400 m?