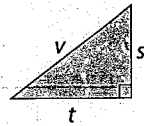


Connect and Reflect

Key Ideas

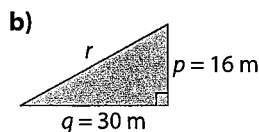
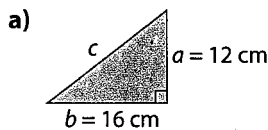
- The Pythagorean relationship connects the three sides of any right triangle. For a right triangle with sides s , t , and v , where side v is the hypotenuse, $v^2 = s^2 + t^2$.
- You can use the Pythagorean relationship to determine the length of an unknown side of a right triangle if the lengths of the other two sides are known.
- You can use the Pythagorean relationship to determine distances that cannot be measured directly.



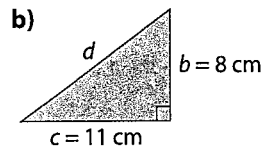
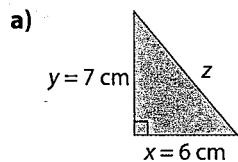
Practise

For help with #1 to #4, refer to Example 1 on page 23.

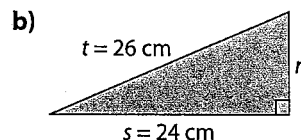
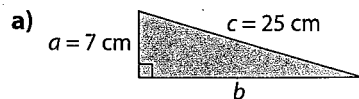
1. Determine the length of each hypotenuse.



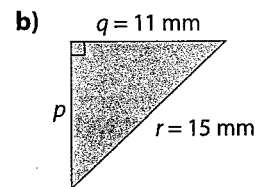
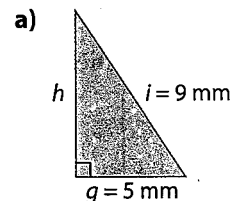
2. What is the length of each hypotenuse?
Give your answer to the nearest tenth of a centimetre.



3. Determine the length of the unknown leg for each right triangle.

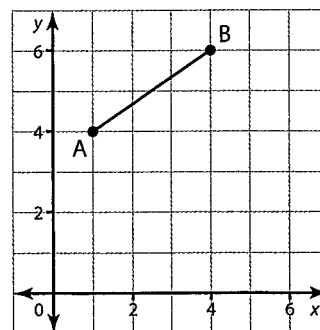


4. What is the missing length of the leg for each triangle? Give your answer to the nearest tenth of a millimetre.

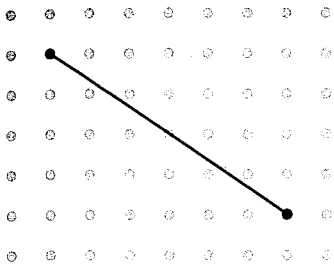


For help with #5 to #7, refer to Example 2 on page 24.

5. What is the length of the line segment?
Express your answer as an exact value and to one decimal place.



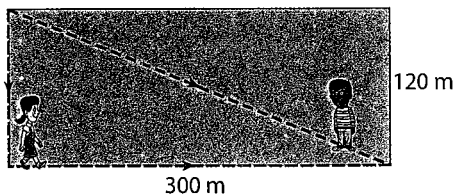
6. What is the length of the line segment on 1-cm dot paper? Express your answer to the nearest tenth of a centimetre.



7. A line segment has endpoints $A(-2, 3)$ and $B(10, 8)$. Draw the line segment and then use the Pythagorean relationship to determine its length.

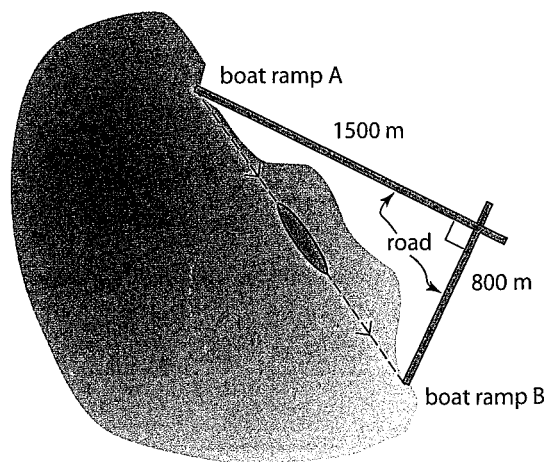
For help with #8 to #10, refer to Example 3 on page 25.

8. Walter walks across a rectangular field in a diagonal line. Maria walks around two sides of the field. They meet at the opposite corner.

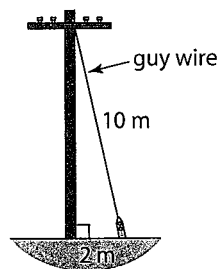


- How far did Maria walk?
- How far did Walter walk? Express your answer to the nearest metre.
- Who walked farther? By how much?

9. a) Anthony and Shalima are canoeing on Cultus Lake near Chilliwack. There are two boat ramps on the lake. How far is it by canoe between the boat ramps?
- b) How much farther is it to travel by road from ramp A to ramp B than to canoe between the two ramps?



10. Find the height of the pole where the guy wire is attached, to the nearest tenth of a metre.



Apply

11. Kira calculated the missing side length of the right triangle.

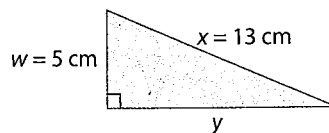
$$y^2 = 5^2 + 13^2$$

$$y^2 = 25 + 169$$

$$y^2 = 194$$

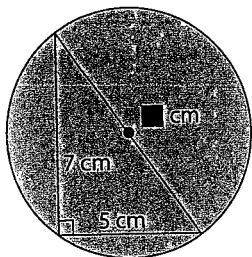
$$y \approx 139$$

The length of side y is approximately 139 cm.

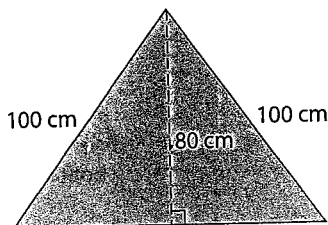


Is Kira correct? If she is correct, explain how you know. If she is incorrect, explain the correct method.

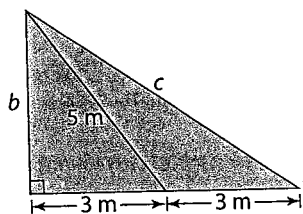
The hypotenuse of the triangle cuts the circle in half. What is the diameter of the circle? Express your answer to the nearest tenth of a centimetre.



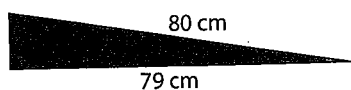
13. The front of a small tent has the dimensions shown. Determine the length of the base of the large isosceles triangle. Express your answer to the nearest tenth of a centimetre.



14. What are the lengths of b and c ? Write your answer to the nearest tenth of a metre, where appropriate.

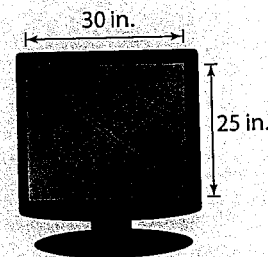


15. What is the height of the wheelchair ramp? Give your answer to the nearest tenth of a centimetre.



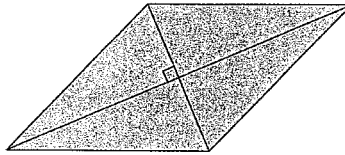
16. Shahriar knows that the size of a television set is based on the length of the diagonal of the screen. He thinks that the diagonal is not as large as the ad says. Is he correct? Explain.

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42-inch
TELEVISION
ON SALE!



17. Johan leans a 300-cm ladder against a wall. The safety sticker on the side of the ladder shows that the bottom must be placed between 70 cm and 110 cm away from the wall. What are the minimum distance and maximum distance up the wall that the ladder can reach? Give your answers to the nearest tenth of a centimetre.

18. The diagonals of a rhombus intersect at a 90° angle and bisect each other. The diagonals are 10 cm and 24 cm. What is the perimeter of the rhombus?



19. **Competency Check** On a certain shoe, each pair of eyelets is separated by a distance of 2.5 cm. The distance across the tongue of the shoe between two eyelets is 3.6 cm. Use the Pythagorean relationship to determine a reasonable length of shoelace for one shoe. What assumptions did you make?



Extend

20. A BC ferry travels east from Swartz Bay at a speed of 34 km/h for 0.5 h. Then it turns 90° and travels north at 30 km/h for 1.6 h. When it reaches Tsawwassen, how far is the ship from Swartz Bay? Express your answer to the nearest kilometre.

