

3.4

Using the Pythagorean Relationship

MathLinks 8, pages 101-105

Key Ideas Review

Choose from the following terms to complete #1.

hypotenuse

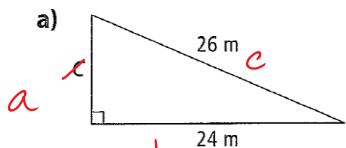
legs

length

Pythagorean

1. The Pythagorean relationship can be used to determine the length of the hypotenuse of a right triangle when the lengths of the two legs are known.

2. Use the relationship to determine the length of C in each triangle, to the nearest whole number. Show your work.

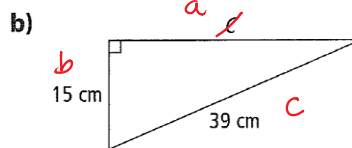


$$a^2 + b^2 = c^2$$

$$a^2 + 24^2 = 26^2$$

$$a^2 = 26^2 - 24^2$$

$$a = 10 \text{ m}$$



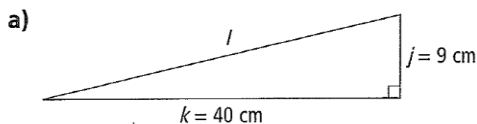
$$a^2 + b^2 = c^2$$

$$a^2 + 15^2 = 39^2$$

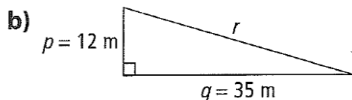
$$a = 36 \text{ cm}$$

Practise and Apply

3. Determine the length of each hypotenuse. Show your work.

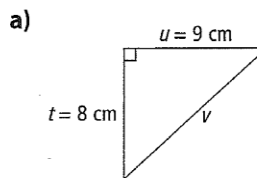


$$41 \text{ cm}$$

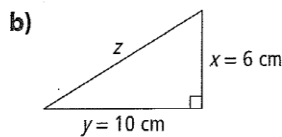


$$37 \text{ m}$$

4. What is the length of each hypotenuse, to the nearest centimetre? Show your work.



$$12 \text{ cm}$$

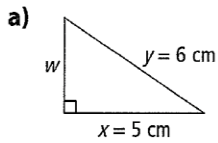


$$12 \text{ cm}$$

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5. Calculate the missing side length for each right triangle, to the nearest tenth of a centimetre. Show your work.



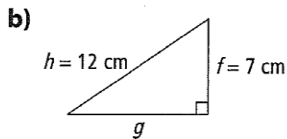
$$w^2 + 5^2 = 6^2$$

$$w^2 + 25 = 36$$

$$w^2 = 36 - 25$$

$$w^2 = 11$$

$$w = 3.3 \text{ cm}$$



$$g^2 + 7^2 = 12^2$$

$$g^2 + 49 = 144$$

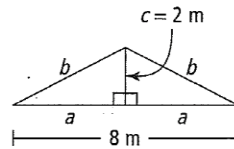
$$g^2 = 95$$

$$g = 9.7 \text{ cm}$$

6. Find the height of a triangle with a base of 4 cm and a hypotenuse of 11 cm. Round to the nearest tenth of a centimetre. Show your work.

$$10.2 \text{ cm}$$

7. A triangle is made up of two smaller congruent right triangles.



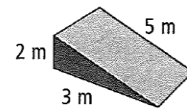
- a) Find the length of the hypotenuse for the right triangles, to the nearest tenth of a metre. Show your work.

$$4.5 \text{ m}$$

- b) Calculate the perimeter of the large triangle, to the nearest tenth of a metre. Show your work.

$$17 \text{ m}$$

8. Ellie and Lucas are going to the skateboard park to try out the new ramp.



Is the new ramp a right triangle? Explain your thinking.

NO.

The areas of the squares on each leg add to 13 m^2 . The area of the square on the long side is 25 m^2 . If the ramp had a right triangle, these two values would be equal.