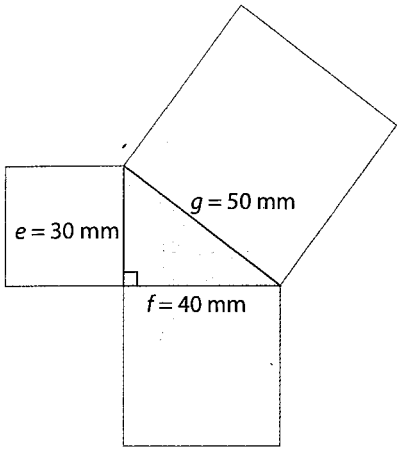
Practise

For help with #1 to #4, refer to Example 1 on page 15.

1. What is the area of each square?



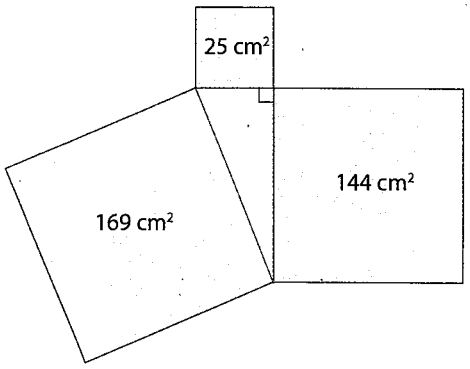
2. A right triangle has side lengths of 40 mm, 75 mm, and 85 mm.

a) Sketch the triangle. Draw a square on each side of the triangle.

b) What is the area of each square?

c) Write an addition statement with the areas of the three squares.

3. a) Write an addition statement using the areas of the three squares.



b) What is the side length of each square?

c) Use words and symbols to describe the relationship between the side lengths of each square.

4. The sides of a right triangle measure 9 cm, 12 cm, and 15 cm.

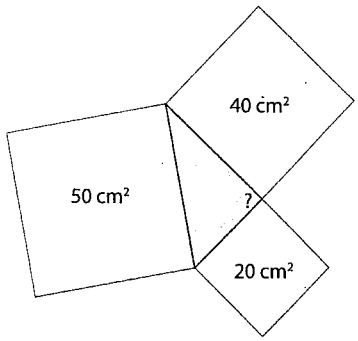
a) What is the area of each square attached to the three sides of the right triangle?

b) Write an addition statement showing the relationship between the areas of the three squares.

c) Use words and symbols to describe the relationship between the side lengths of each square.

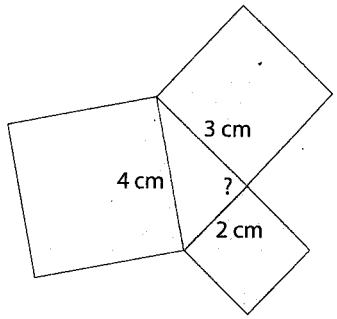
For help with #5 to #7, refer to Example 2 on page 16.

5. Is the triangle shown a right triangle? Explain your reasoning.



6. a) Calculate the areas of the three squares.

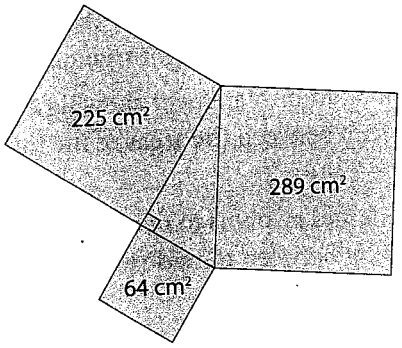
b) Is the triangle a right triangle? Explain.



7. The side lengths of a triangle are 5 cm, 6 cm, and 8 cm. Determine whether the triangle is a right triangle. Explain.

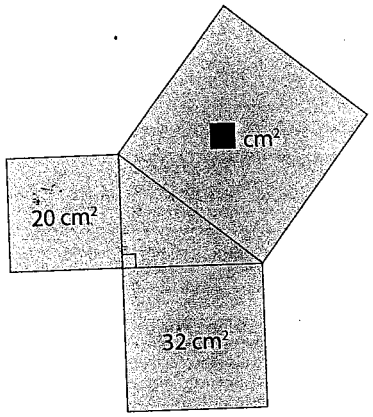
Apply

8. Use words and symbols to describe the relationship among the areas of the three squares shown.

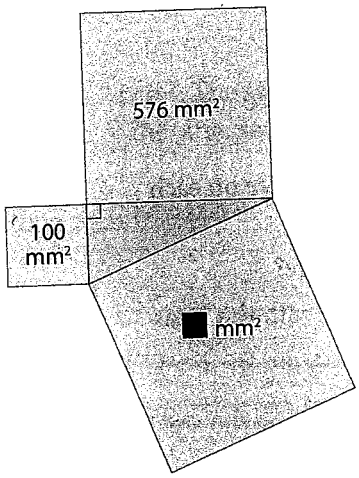


9. Use the Pythagorean relationship to find the unknown area of each square.

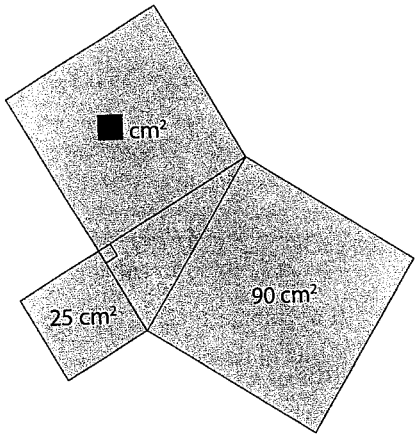
a)



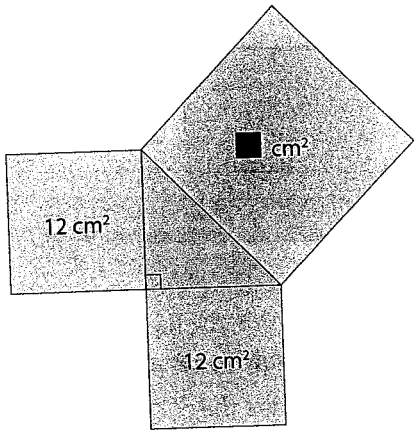
b)



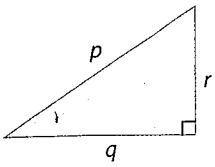
c)



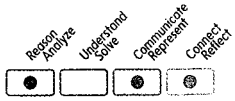
d)



10. Kendra wrote the Pythagorean relationship as $r^2 = p^2 + q^2$ for the triangle shown. Is she correct? Explain.



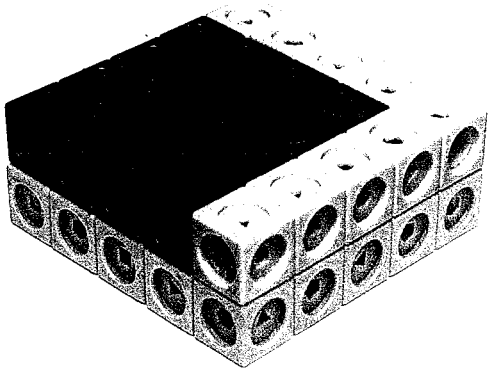
11. Samuel used three coloured squares of linking cubes (green, yellow, and pink) to build a right triangle. He placed the green square next to one leg and attached the pink square to the hypotenuse.



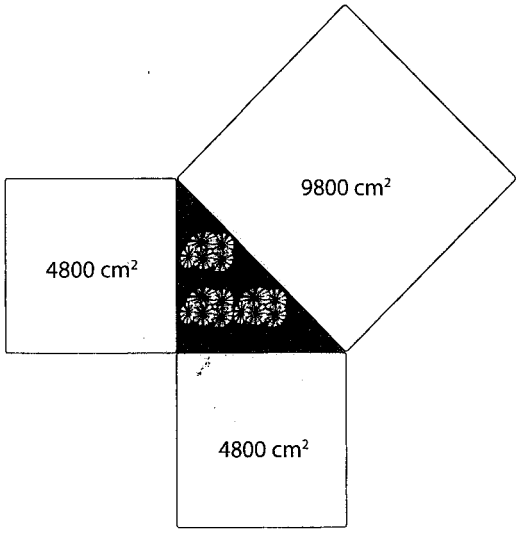
a) What is the area of the yellow square?

b) What is the perimeter of the triangle?

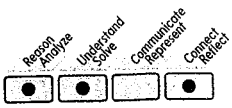
c) Samuel claims that by rearranging the cubes into the two layers shown in the diagram, he has demonstrated the Pythagorean relationship. What do you think he means?



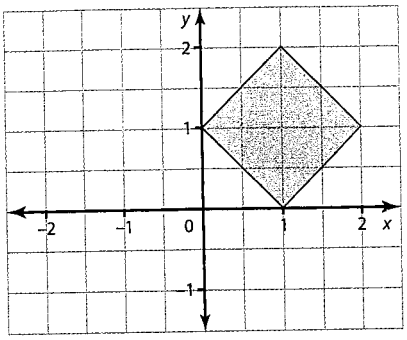
12. A small triangular flower bed has a square stepping stone at each of its sides. Is the flower bed in the shape of a right triangle? Explain your reasoning.



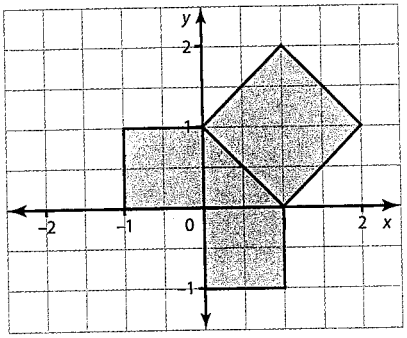
13. ✓ **Competency Check** A square has its vertices at the coordinates (0, 1), (1, 0), (2, 1), and (1, 2).



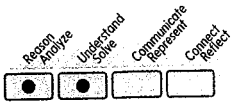
a) What is the area of the square? Explain your reasoning.

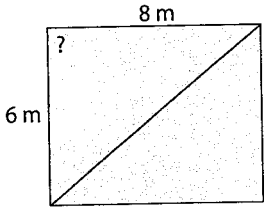


b) Using the side lengths of the blue squares, determine the exact perimeter of the yellow triangle.



14. Construction workers are laying out the rectangular foundation for a new building. They want to check that the corner is 90°. They measure the diagonal as shown to be 9.5 m. Is the angle 90°? Explain your reasoning.





15. Use the table to answer the following questions.

Leg (mm)	Leg (mm)	Hypotenuse (mm)
3	4	5
6	8	10
0.6	0.8	1.0

a) Confirm that the triangles with the given side lengths are all right triangles.

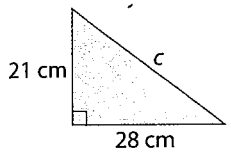
b) How are the three sets of sides related?

c) Use your answer to part b) to find two sets of sides that are related to a right triangle with sides 8 mm, 15 mm, and 17 mm.

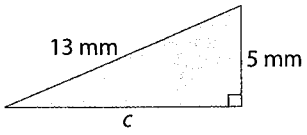
16. Danelle is trying to install a corner shelf in her bedroom. Since the shelf does not fit properly, she thinks the two walls in her bedroom do not meet at a right angle. She measures a length of 30 cm along the base of each wall away from the corner. Then, she measures the hypotenuse to be 43 cm. Do the walls meet at a right angle? Explain.

17. What is the area of the square that can be drawn on side c of each triangle?

a)



b)



18. Show whether each triangle in the table is a right triangle.

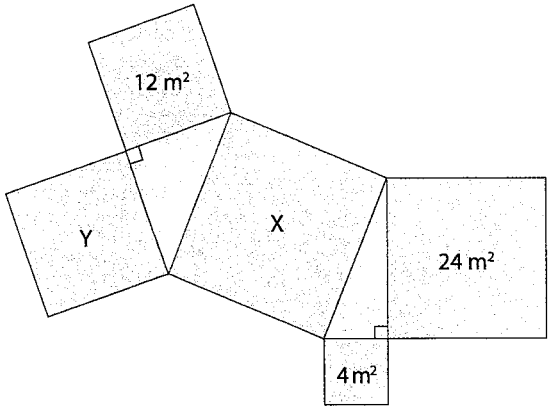
Triangle	Side Lengths (cm)
A	9, 12, 15
B	7, 8, 11
C	7, 24, 25
D	16, 30, 34
E	10, 11, 14

Extend

19. The diagram is made of two right triangles and five squares.

a) What is the area of square X?

b) What is the area of square Y?



20. A right triangle has a square attached to each side. Two of the squares have areas of 10 cm² and 15 cm². What are possible areas for the third square? Draw a sketch for each solution. Discuss your findings with a partner.

21. A right triangle has sides of 3 cm, 4 cm, and 5 cm. A semicircle is attached to each side. Describe the relationship between the areas of the semicircles.