Date: ____/____/____ Name: _____ Block ID: _____

3. Pythagorean Relationship Practice Test

For #1 to #5, select the best answer.

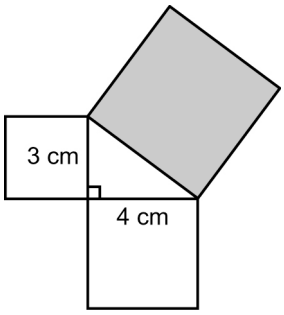
1. Which number is not a perfect square?
A 9 **B** 16 **C** 55 **D** 121

2. A square has a side length of 9 mm. What is the area of the square?
A 18 mm² **B** 36 mm² **C** 49 mm² **D** 81 mm²

3. The square root of 63 is closest to which whole number?
A 5 **B** 6 **C** 7 **D** 8

4. What is the side length of the square in the diagram?
A 5 cm **B** 6 cm **C** 9 cm **D** 12 cm

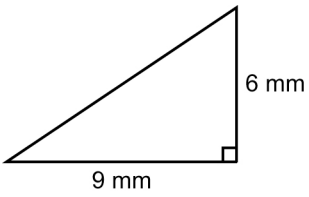
5. What is the area of the shaded square?
A 25 cm² **B** 36 cm²
C 49 cm² **D** 60 cm²



Short Answers

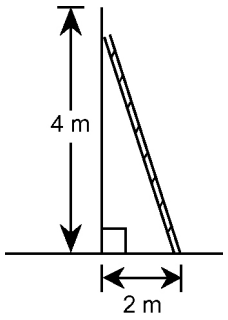
6. What is the area of a square with the following side length?
a) 8 cm **b)** 11 m **c)** 50 mm **d)** 13 cm

7. Find the value of the missing side length, to the nearest tenth of a millimetre.



8. Is a triangle with side lengths measuring 8 m, 6 m, and 10 m a right triangle? Show all of your work, and explain your reasoning.

9. How long is the ladder to the nearest tenth of a metre?



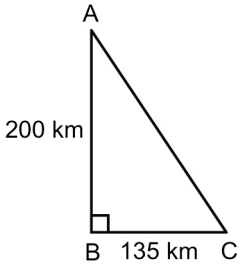
10. Estimate the square root of the following numbers, to the nearest tenth. Show your thinking.

a) 39 **b)** 137 **c)** 175 **d)** 420

11. In your own words, describe what the formula $c^2 = a^2 + b^2$ tells about the relationship among the sides in a right triangle.

Extended Responses

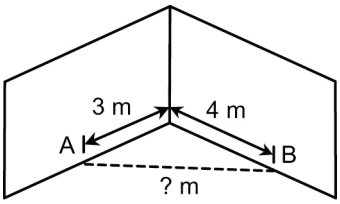
12. Two cars leave A at the same time. Martin's car travels directly from A to C at a constant rate of 80 km/h. Kathleen's car travels from A to B at a constant rate of 100 km/hour, and then continues to C at a constant rate of 90 km/h.



a) Who will arrive at C first?

b) How many minutes later will the second person arrive?

13. Carpenters are checking to see if two walls meet in a corner to form a 90º angle. They measure 3 m from the corner along one wall to point A and 4 m from the corner along the other wall to point B.



a) If the angle is 90º, what is the distance from A to B?

b) Why do you think it is important for the two walls to create a 90º angle?

14. Can a perfect square less than 1000 ever have a last digit that is 2, 3, 7, or 8?

- If your answer is no, explain why it is not possible.
- If your answer is yes, justify your answer and provide an example.

3. Pythagorean Relationship Practice Test Answers

1. C

2. D

3. D

4. B

5. A

6. a) 64 cm^2 **b)** 121 m^2 **c)** 2500 mm^2 **d)** 169 cm^2

7. 10.8 mm

8. Yes, it is a right triangle. $10^2 = 6^2 + 8^2$,
100 = 100. The area of the large square is the same as the sum of the areas of the two smaller squares.

9. 4.5 m

10. Answers may vary. Examples: **a)** 6.2 **b)** 11.7 **c)** 13.2 **d)** 20.5

11. The square of the hypotenuse of a right triangle equals the sum of the squares of the other two sides.

12. Martin: 3.02 h, or 3 h and 1 min; Kathleen: 3.5 h, or 3 h and 30 min…
a) Martin will arrive first. **b)** 29 min

13. a) 5 m **b)** Answers may vary. Example: It provides a basis for the traditional square shape of a room and is visually appealing.

14. No, it is not possible. When you square any number from 0 to 9, the result never has a last digit that is 2, 3, 7, or 8. That means if you square any number having a last digit from 0 to 9, the result will never have a last digit that is 2, 3, 7, or 8.