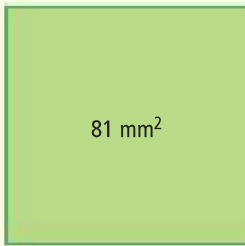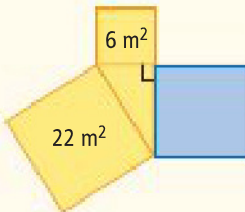*For #1 to #5, choose the best answer.*

1. Which number is a perfect square?
   - **A** 10
   - **B** 20
   - **C** 50
   - **D** 100

2. What is the side length of the square in the diagram?

   81 mm²

   - **A** 6 mm
   - **B** 9 mm
   - **C** 12 mm
   - **D** 18 mm

3. A square has a side length of 7 cm. What is the area of the square?
   - **A** 14 cm²
   - **B** 21 cm²
   - **C** 28 cm²
   - **D** 49 cm²

4. A right triangle has squares on each of its sides. What is the area of the blue square?

   6 m²

   22 m²

   - **A** 4 m²
   - **B** 14 m²
   - **C** 16 m²
   - **D** 28 m²

5. The value of $\sqrt{51}$ is closest to which whole number?
   - **A** 7
   - **B** 8
   - **C** 49
   - **D** 51

Complete the statements in #6 and #7.

6. For a right triangle with sides a, b, and c, the Pythagorean relationship is $c^2 = a^2 + b^2$. The variable that represents the length of the hypotenuse is ■.

7. A square has an area of 53 cm². When you calculate the side length of the square, to the nearest tenth, the answer is ■.
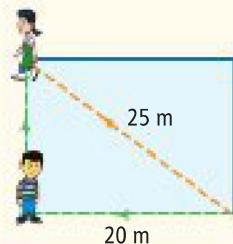
Short Answer

8. The legs of a right triangle measure 3 cm and 7 cm.
   a) Use a calculator to determine the approximate length of the hypotenuse, to the nearest tenth of a centimetre.
   b) Explain why the length is an approximation both before and after you round the answer.

9. The rectangular pool at Wild Water World has a length that measures 15 m and a diagonal that measures 17 m. A float line divides the shallow end and deep end. What is the length of the float line?
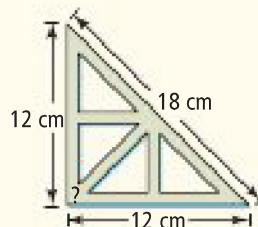
   17 m

   15 m
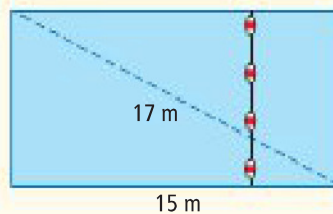
10. a) Identify a whole number that has its square root between 7 and 8.
    b) How many whole numbers have a square root between 7 and 8? Identify these whole numbers.

11. Use the Pythagorean relationship to determine whether a triangle with sides of 14 mm, 48 mm, and 50 mm is a right triangle. Show your work.

12. Josie skated diagonally across a rectangular ice rink. Han is skating along two sides of the rink and has just reached the first corner. How much farther does he have to skate to meet up with Josie?
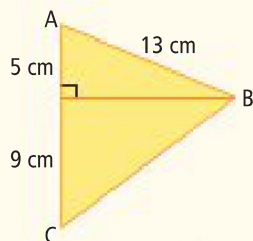

25 m
20 m

Extended Response

13. Determine the perimeter of △ABC.

A
13 cm
5 cm
B
9 cm
C

14. A carpenter's square is a tool in the shape of a right triangle. Joe thinks there may be something wrong with the one he bought. Determine whether the carpenter's square shown is a right triangle. Explain your reasoning.

12 cm
18 cm
?
12 cm

15. The prime factorization of 15 876 is $2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 7 \times 7$.

a) How can you use prime factorization to determine that 15 876 is a perfect square?

b) Use a calculator to check that 15 876 is a perfect square. Show your work.

c) Explain how you can calculate $\sqrt{15\,876}$ using its prime factors.

WRAP IT UP!

Create a game of your own. Include squares and right triangles in the game board. Write rules for your game.

The design of your board or the way you play your game needs to cover the following concepts:
- calculating the square of a number
- calculating the square root of a perfect square
- estimating the square root of a non-perfect square
- using the Pythagorean relationship to determine if a triangle is a right triangle
- determining the missing side length of a right triangle

Show how you have covered the concepts.