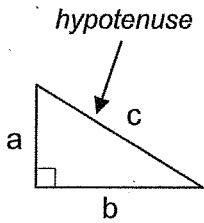


G8-45: Pythagorean Theorem

key



The longest side of a right-angled triangle is called the hypotenuse. Square the lengths of the two shortest sides of a right-angled triangle, then sum the results: $a^2 + b^2$. The sum will always equal the square of the length of the hypotenuse:

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

This is called the **Pythagorean Theorem**.

HINT:

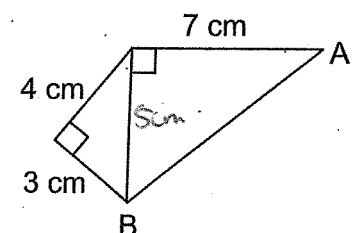
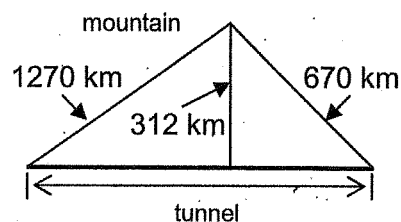
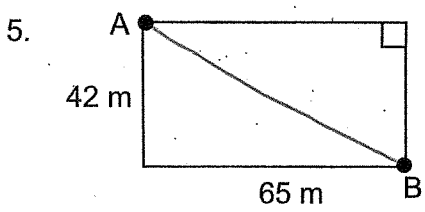
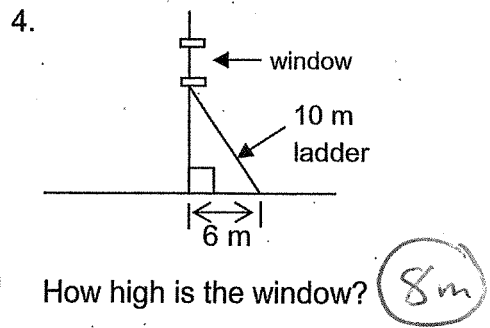
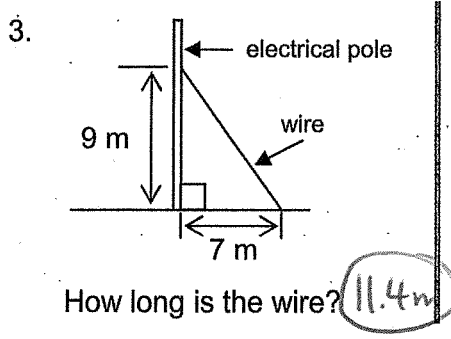
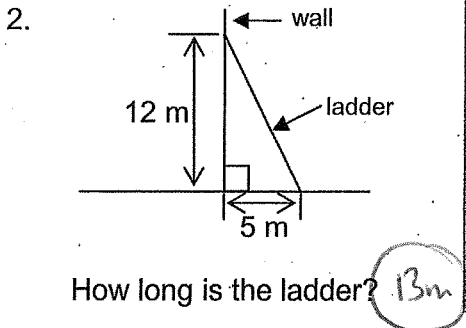
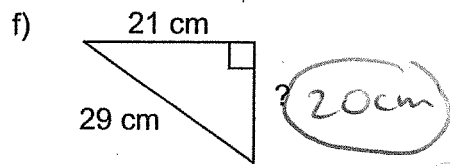
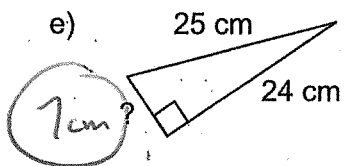
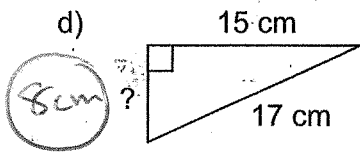
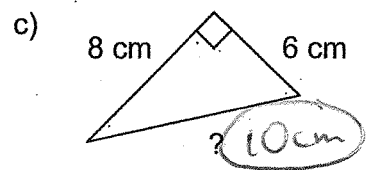
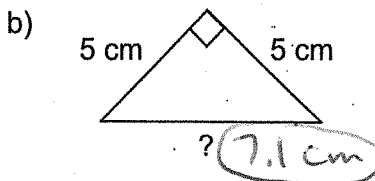
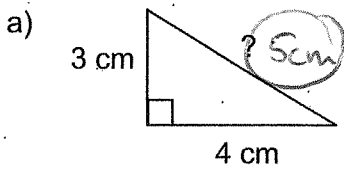
If you know the length of the hypotenuse and one of the shorter sides, you can find the length of the other side.

$$b^2 = c^2 - a^2 \text{ or } a^2 = c^2 - b^2$$

Answer the questions below in your notebook.

1. Use the Pythagorean Theorem to find the missing sides:

HINT: Start by deciding whether or not the unknown side is the hypotenuse. The hypotenuse is always opposite the right angle.



a) What is the distance from A to B? **77.4 m**

b) How long is the tunnel? **1524 km**

c) How long is AB? **8.6 cm**

6. Three nonzero whole numbers a , b , and c that satisfy $a^2 + b^2 = c^2$ are called a Pythagorean triple. Write down the first 15 perfect squares. How many Pythagorean triples can you find?

7. If you multiply or divide each number in a Pythagorean triple by the same number, the result is a Pythagorean triple. Make 3 Pythagorean triples using the numbers 6, 8 and 10.