Pythagoras

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Find the hypotenuse of a right triangle with legs 5 cm and 12 cm. [2 marks]

$c^2 = 25 + 144 = 169.$

$c = 13\,\text{cm}.$

Answer: 13 cm

2. A right triangle has hypotenuse 13 m and one leg 5 m. Find the other leg. [2 marks]

$b^2 = 169 - 25 = 144.$

$b = 12\,\text{m}.$

Answer: 12 m

3. Find the diagonal of a square with side 6 cm. Give an exact answer and then one decimal place. [3 marks]

$d^2 = 6^2 + 6^2 = 72.$

$d = \sqrt{72} = 6\sqrt{2} \approx 8.5\,\text{cm}.$

Answer: $6\sqrt{2}$ cm; 8.5 cm

4. A rectangular field is 9 m by 12 m. How far is it between opposite corners? [2 marks]

The diagonal is the hypotenuse.

$d = \sqrt{9^2 + 12^2} = 15\,\text{m}.$

Answer: 15 m

5. A 15 m cable reaches from the top of a vertical post to the ground 9 m away. Find the post's height. [2 marks]

$h^2 = 15^2 - 9^2 = 144.$

$h = 12\,\text{m}.$

Answer: 12 m

6. A student finds a missing leg in a triangle with hypotenuse 10 and other leg 6 by calculating $\sqrt{100 + 36}$. Explain and correct the error. [3 marks]

The unknown leg cannot exceed the hypotenuse.

$b^2 = 100 - 36 = 64$, so $b = 8$.

Answer: Subtract instead: the missing leg is 8 units.