Multi-step right-triangle problems

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. Find the diagonal of a 9 cm by 12 cm rectangle. [2 marks]

$d^2 = 9^2 + 12^2 = 225$.

$d = 15$ cm.

Answer: 15 cm

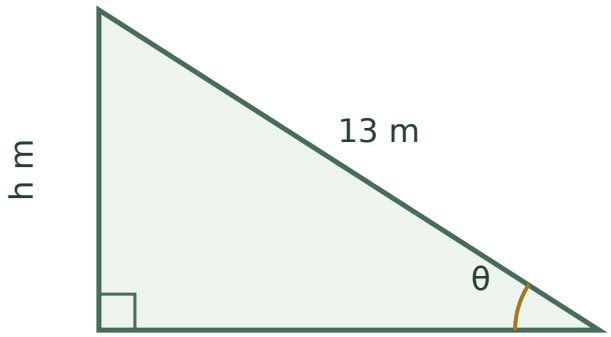
2. A cuboid has perpendicular edges 3 m, 4 m and 12 m. Find its space diagonal. [3 marks]

The base diagonal is $\sqrt{3^2 + 4^2} = 5$ m.

The space diagonal is $\sqrt{5^2 + 12^2} = 13$ m.

Answer: 13 m

3. A 13 m ladder has its foot 5 m from a wall. How high does it reach? [2 marks]



Sketch not to scale

$h^2 = 13^2 - 5^2 = 144$.

$h = 12$ m.

Answer: 12 m

4. A rectangular garden has diagonal 26 m and width 10 m. Find its perimeter. [3 marks]

The other side is $\sqrt{26^2 - 10^2} = 24$ m.

The perimeter is $2(24 + 10) = 68$ m.

Answer: 68 m

5. A symmetrical roof has span 16 m and rise 6 m. Find the total length of its two sloping edges. [3 marks]

Each half has run 8 m.

Each slope is $\sqrt{8^2 + 6^2} = 10$ m.

There are two slopes.

Answer: 20 m

6. A student claims a right triangle with hypotenuse 17 cm and leg 8 cm has other leg 19 cm. Correct the result and explain. [3 marks]

$x^2 = 17^2 - 8^2 = 225$.

$x = 15$ cm.

Subtract the known leg square from the hypotenuse square.

Answer: 15 cm; a leg cannot exceed the hypotenuse.