Right-triangle revision

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. A right triangle has legs 9 cm and 12 cm. For the angle opposite 9 cm, find all three ratios. [3 marks]

$h = \sqrt{9^2 + 12^2} = 15.$

Substitute into the definitions and simplify.

Answer: $\sin\theta = \frac{3}{5},\ \cos\theta = \frac{4}{5},\ \tan\theta = \frac{3}{4}$

2. Find the opposite side when the hypotenuse is 14 m and the angle is 30°. [3 marks]

$o = 14\sin 30^\circ = 7.$

Answer: 7 m

3. The adjacent leg is 8 cm and the angle is 60°. Find the hypotenuse. [3 marks]

$\cos 60^\circ = \frac{8}{h}$, so $h = 16.$

Answer: 16 cm

4. A ramp rises 1.2 m over a horizontal run of 4 m. Find its angle to one decimal place. [3 marks]

$\tan\theta = \frac{1.2}{4} = 0.3.$

$\theta = \tan^{-1}(0.3) \approx 16.699^\circ.$

Answer: 16.7°

5. A wire makes 35° with horizontal ground and reaches 10 m horizontally. Find its length to two decimal places. [3 marks]

$L = \frac{10}{\cos 35^\circ} \approx 12.2077.$

Answer: 12.21 m

6. Explain why a right triangle cannot have hypotenuse 7 cm and leg 9 cm. [3 marks]

A sine or cosine ratio of $\frac{9}{7}$ would exceed 1, confirming inconsistent side data.

Answer: The hypotenuse must be longest.