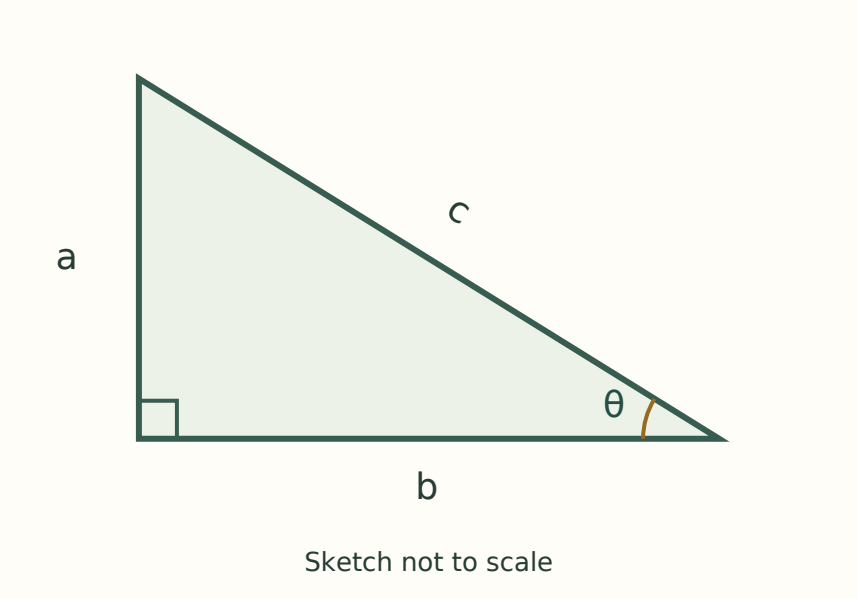
Pythagoras and Trigonometry - Practice paper 1

16 questions | 43 marks | 55 minutes

Apply right-triangle geometry to diagrams, lengths, angles and contextual decisions.

Equivalent correct methods earn the corresponding marks.

1. In the sketch, which side is the hypotenuse? [1 mark]



Sketch not to scale

c faces the marked right angle.

Answer: c

2. Find the hypotenuse with legs 6 cm and 8 cm. [2 marks]

$c = \sqrt{36 + 64} = 10$ cm.

Answer: 10 cm

3. Hypotenuse = 17 cm and one leg = 15 cm. Find the other leg. [2 marks]

$x = \sqrt{289 - 225} = 8$ cm.

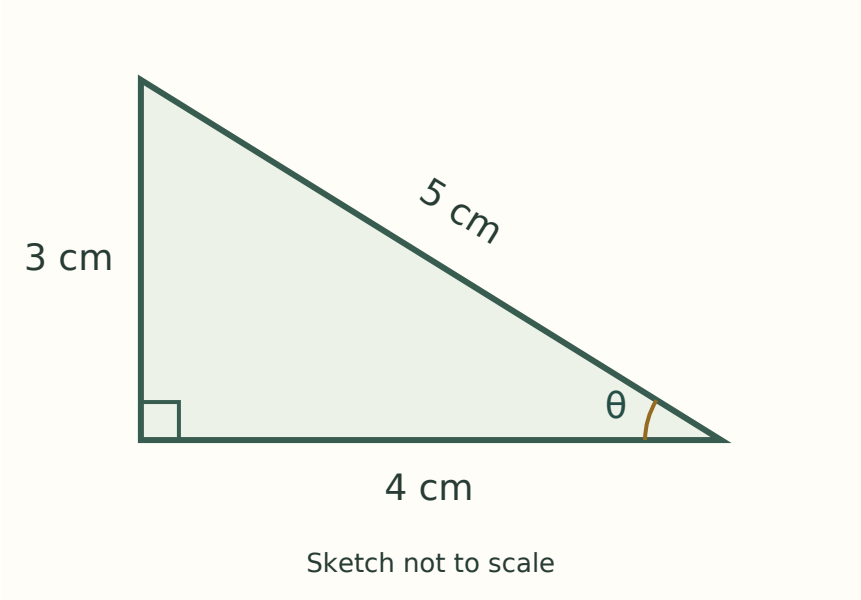
Answer: 8 cm

4. Find the hypotenuse with legs 3 m and 5 m, exactly and to two decimal places. [3 marks]

$c = \sqrt{9 + 25} = \sqrt{34} \approx 5.83$ m.

Answer: $\sqrt{34}$ m; 5.83 m

5. For θ in this sketch, name the opposite and adjacent lengths. [2 marks]



Sketch not to scale

The vertical 3 cm side is across from θ.

The horizontal 4 cm side touches θ.

Answer: Opposite 3 cm; adjacent 4 cm

6. Opposite, adjacent and hypotenuse are 5, 12 and 13. State sin θ, cos θ and tan θ. [3 marks]

Use sin $= o/h$, cos $= a/h$, tan $= o/a$.

Answer: 5/13, 12/13, 5/12

7. Evaluate sin 30°. [1 mark]

Use degree mode: sin 30° = 0.5.

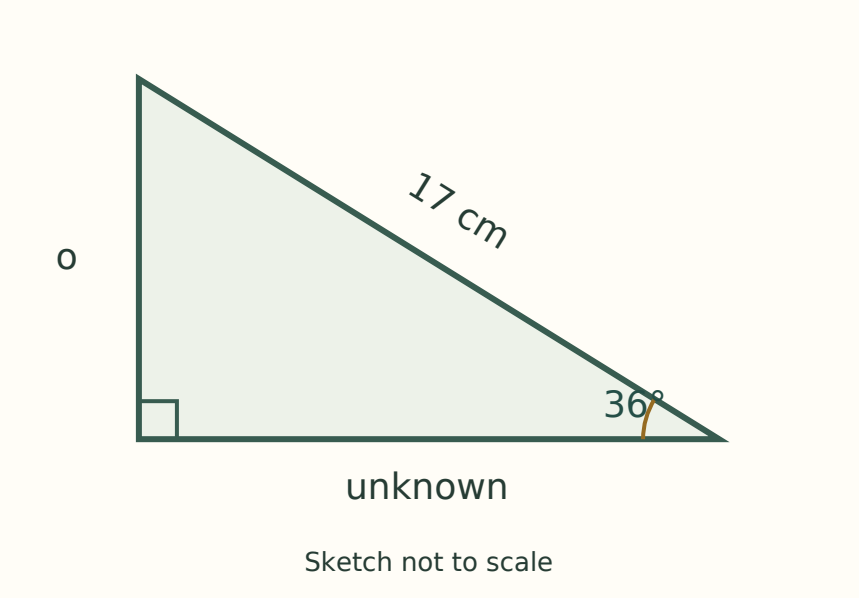
Answer: 0.5

8. Hypotenuse = 10 m and opposite = 6 m. Find adjacent. [2 marks]

$a = \sqrt{100 - 36} = 8$ m.

Answer: 8 m

9. Find opposite when hypotenuse = 17 cm and θ = 36°. Round to two decimal places. [3 marks]



Sketch not to scale

$o = 17\sin 36^\circ$.

Answer: 9.99 cm

10. Find opposite when adjacent = 9 m and θ = 28°. Round to two decimal places. [3 marks]

$o = 9\tan 28^\circ$.

Answer: 4.79 m

11. Find hypotenuse when opposite = 7 cm and θ = 40°. Round to two decimal places. [3 marks]

$\sin 40^\circ = 7/h$.

$h = 7/\sin 40^\circ$.

Answer: 10.89 cm

12. Find θ when adjacent = 9 cm and hypotenuse = 15 cm. Round to two decimal places. [3 marks]

$\theta = \cos^{-1}(9/15)$.

Answer: 53.13°

13. Similar right triangles have opposite/adjacent = 3/4. Find opposite when adjacent = 28 cm. [3 marks]

$o = 28(3/4) = 21$ cm.

Answer: 21 cm

14. A rectangular field is 18 m by 24 m. Answer each part. [5 marks]

(a) Find the diagonal. [2 marks]

$d^2 = 324 + 576 = 900$.

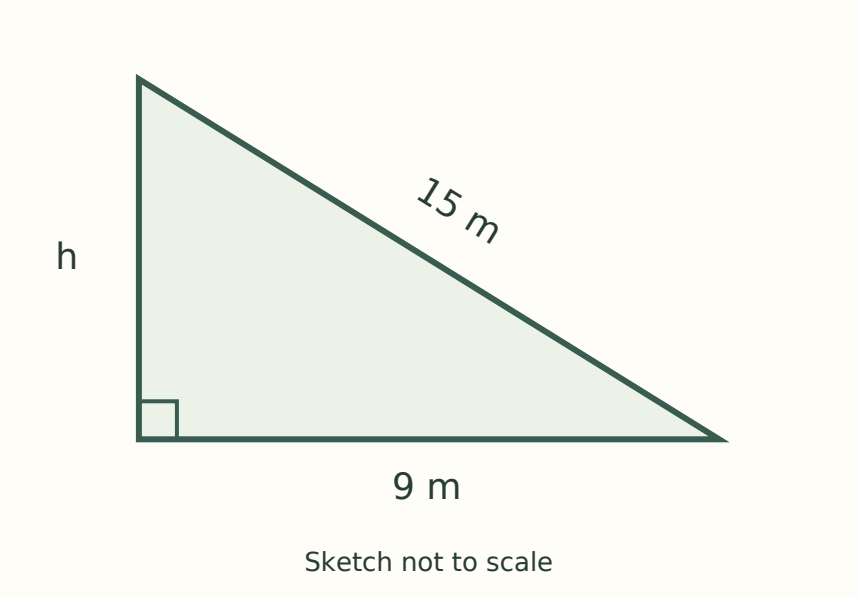
Answer: 30 m

(b) Find the angle between the diagonal and the 24 m side, to two decimal places. [3 marks]

$\theta = \tan^{-1}(18/24)$.

Answer: 36.87°

15. A 15 m ladder has its foot 9 m from a vertical wall. How high does it reach? [3 marks]



Sketch not to scale

$h = \sqrt{225 - 81} = 12$ m.

Answer: 12 m

16. A student writes tan 30° = x/10, then x = 10/tan 30°. Correct the rearrangement and find x to two decimal places. [4 marks]

Multiply both sides by 10: $x = 10\tan 30^\circ$.

The student divided instead of multiplying.

Answer: $x = 10\tan 30^\circ \approx 5.77$