Pythagoras and Trigonometry - Practice test 1

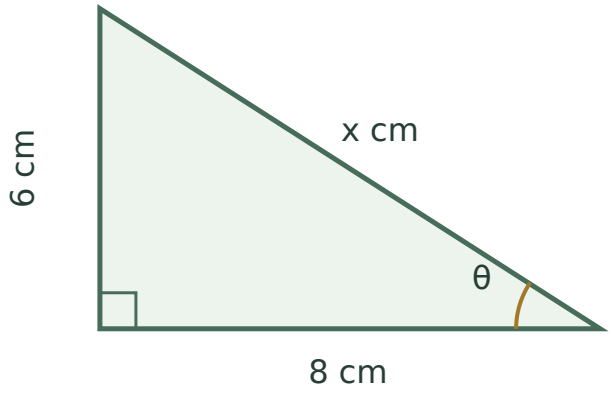
Name: _____ Date: _____

16 questions | 50 marks | 60 minutes

A balanced paper moving from right triangles to non-right triangles, exact values, graphs and applications.

A scientific calculator may be used.

1. Find the hypotenuse x of the right triangle shown. [2 marks]



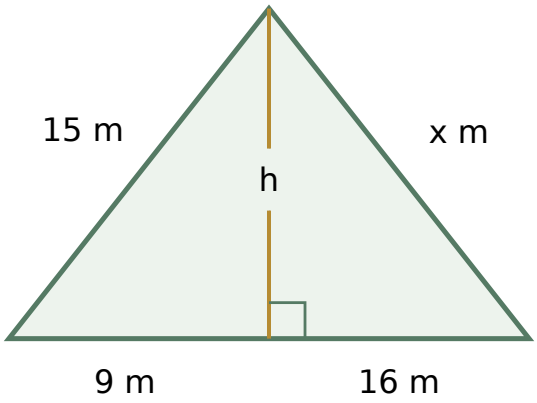
Sketch not to scale

2. A 10 m ladder makes an angle of 26° with level ground. Find the height it reaches, to 0.1 m. [2 marks]

3. An observer eye is 1.4 m high, 18 m from a pole on level ground. Top elevation is 42°. Find pole height to 0.1 m. [3 marks]

4. The bearing of a hut from a campsite is 318°. Find the bearing of the campsite from the hut. [2 marks]

5. Two right triangles share a height. The left base is 9 m and its hypotenuse is 15 m. The right base is 16 m. [4 marks]



The height h is shared; sketch not to scale.

(a) Find the shared height. [2 marks]

(b) Find the right hypotenuse and the full base. [2 marks]

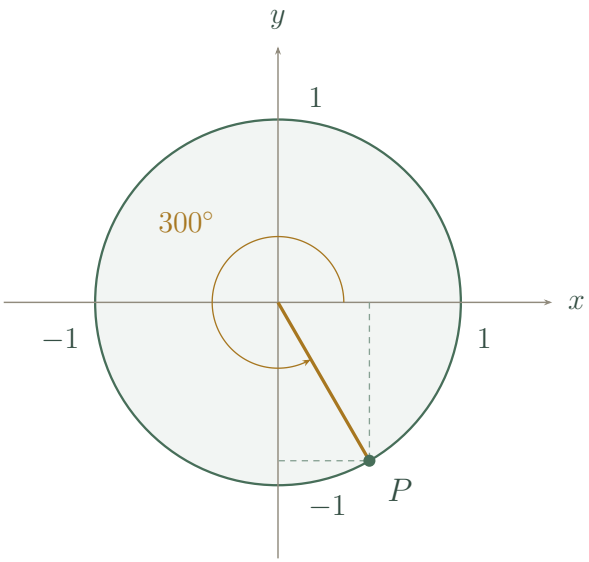
6. In triangle ABC, $A = 42^\circ$, $B = 58^\circ$ and $a = 11$ cm. Find b to 0.1 cm. [3 marks]

7. Two sides of a triangle are 6 cm and 9 cm. Their included angle is 70°. Find the opposite side to 0.1 cm. [3 marks]

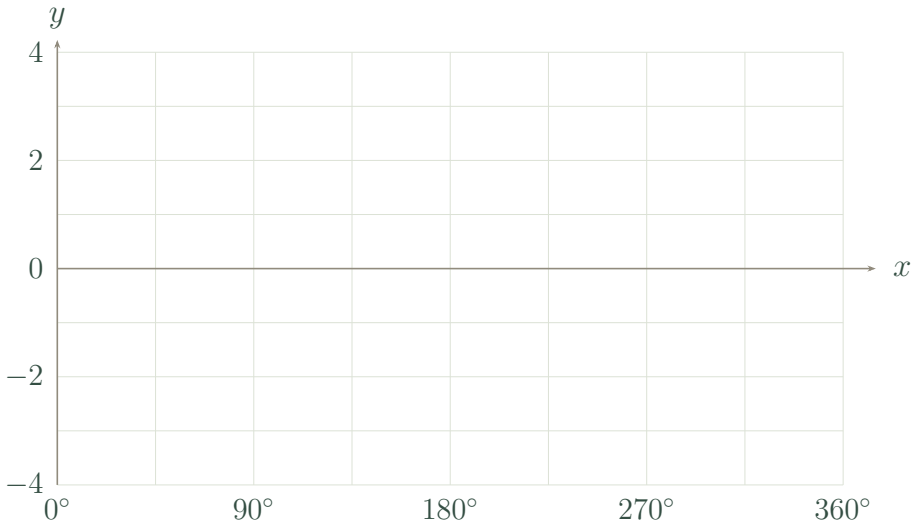
8. Two sides of a triangular plot are 12 m and 15 m, with included angle 35°. Find its area to 0.1 m². [3 marks]

9. Evaluate $\sin 60^\circ + \cos 60^\circ$ exactly. [2 marks]

10. Give the exact coordinates of the unit-circle point at 300°. [3 marks]



11. Sketch $y = 2\cos x$ for $0^\circ \leq x \leq 360^\circ$ on the supplied grid. Label the intercepts and turning points. [4 marks]



12. Solve $\sin x = -\frac{\sqrt{2}}{2}$ for $0^\circ \leq x \leq 360^\circ$. [3 marks]

13. Solve $\cos(2x) = 0$ for $0^\circ \leq x \leq 360^\circ$. [3 marks]

14. A triangle has $A = 40^\circ$, $a = 9$ cm and $b = 12$ cm. Find every possible B to 0.1°. [4 marks]

15. A student estimates a height as $30\tan 28^\circ$ metres. [4 marks]

(a) Calculate the height to 0.1 m using the full calculator value. [2 marks]

(b) The student rounds $\tan 28^\circ$ to 0.53 first. Find that height and explain the difference. [2 marks]

16. Two ground-level observation points lie on the same straight line towards a tower. The farther point is 20 m behind the nearer point. Elevations are 30° at the farther point and 45° at the nearer point. Find tower height to 0.1 m. [5 marks]