Trigonometry – Question Set

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1. Finding Missing Sides

Q1 Right triangle with hyp. 10 cm, angle 35° at base. Find the *adjacent* side (1 dp).

Q2 (a) Right triangle, $\theta = 41°$, opp. side = 7 m. Find the hypotenuse (1 dp). (b) Same triangle – find the adjacent side (1 dp).

Q3 A ladder 4.5 m long leans against a wall making 68° with the ground. Find the height reached.

Q4 In a right triangle, $a = 6$ cm, hyp. = 11 cm. Determine the other leg.

2. Finding Angles

Q5 Triangle with legs 9 cm and 14 cm. Find the angle opposite the 9 cm side (nearest degree).

Q6 Right triangle sides 5 cm, 12 cm, 13 cm. Find the two acute angles.

Q7 A ramp rises 1.1 m over 8 m. Calculate its angle of inclination (1 dp).

Q8 In $\triangle PQR$, $PQ = 7, PR = 9$ and right angle at Q. Find $\angle PRQ$.

3. Pythagoras Checks

Q9 Are 8 cm, 15 cm, 17 cm sides of a right triangle? Justify.

Q10 Find the diagonal of a rectangle 5.2 cm by 9.4 cm (1 dp).

Q11 A square garden has diagonal 14 m. Find the side length (1 dp).

4. Elevation & Depression

Q12 Angle of elevation to the top of a tower 22 m away is 29°. Find tower height (nearest tenth metre).

Q13 From a lighthouse 35 m above sea level, the angle of depression to a boat is 5°. How far is the boat from the base of the lighthouse?

Q14 A drone rises vertically 60 m while its horizontal distance from the pilot increases to 140 m. Find the angle of elevation of the drone.

5. Two-step & Ramp Problems

Q15 A wheelchair ramp is 9 m long and rises 0.75 m. (a) Find its angle to the horizontal. (b) Express the slope as a percentage.

Q16 A zip-line descends at 11° over 120 m. Determine the vertical drop (1 dp).

6. Bearings & Planar Distance

Q17 From A, B is 160 m due east; from B, C is 210 m due south. (a) Find distance AC (1 dp). (b) Give the bearing of C from A (nearest degree).

Q18 A hiker walks 3 km on a bearing of 045° then 4 km on 120°. Find how far she is from the start (1 dp).

7. Exact Ratios & Special Triangles

Q19 Write $\sin 30°$, $\cos 45°$, $\tan 60°$ as exact surds or fractions.

Q20 In an equilateral triangle of side 12 cm, find its height ($\sqrt{3}$ form).

Challenge Question

Q1 A lookout is located on a cliff 52 m above a horizontal plain. From the lookout, the angle of depression to a parked vehicle is 18°. Some time later the vehicle drives directly toward the base of the cliff; the angle of depression changes to 27°.

a) How far was the vehicle from the foot of the cliff initially (nearest metre)?

b) How far did it travel to reach the second position?

c) What percentage change occurred in the angle of depression?