Practical trigonometry - Practice test 1

Name: _____ Date: _____

10 questions | 42 marks | 70 minutes

Use degree mode. Give calculated lengths and angles to one decimal place unless stated otherwise; bearings use three digits to the nearest degree. In triangle ABC, a is opposite A, b opposite B and c opposite C. Show working and units.

A scientific calculator may be used.

1. Triangles ABC and DEF are similar in that order. $AB = 5\,\text{cm}$, $BC = 7\,\text{cm}$, $AC = 9\,\text{cm}$ and $DE = 10\,\text{cm}$. [4 marks]

(a) Find the scale factor ABC to DEF, then EF. [2 marks]

(b) Find DF and the larger-to-smaller area ratio. [2 marks]

2. Triangle PQR is right-angled at Q and $P = 32^\circ$. [4 marks]

(a) Name the hypotenuse and find R. [2 marks]

(b) Relative to P, identify the opposite and adjacent legs. [2 marks]

3. A rectangular garden is 15 m by 20 m. [4 marks]

(a) Find its diagonal. [2 marks]

(b) A student suggests 18 m. Reject this without repeating the calculation. [2 marks]

4. A 7 m ladder makes angle 67° with level ground and touches a vertical wall. [4 marks]

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

(b) Find the horizontal distance of its foot from the wall. [2 marks]

5. An instrument is 1.5 m above level ground, 24 m horizontally from a tower. Elevation to its top is 38°. [4 marks]

(a) Find the rise above instrument level. [2 marks]

(b) Find the tower height and explain the instrument correction. [2 marks]

6. A campsite is 18 km east and 24 km north of a station. [4 marks]

(a) Find the direct distance. [2 marks]

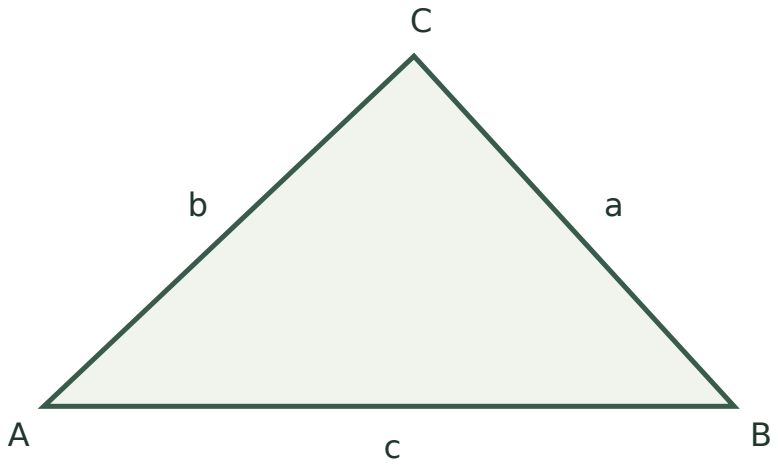
(b) Find its bearing from the station. [2 marks]

7. Two sides of a triangular banner are 8 m and 11 m, enclosing 50°. [4 marks]

(a) Find its area. [2 marks]

(b) Find the maximum possible area with these two sides and state when it occurs. [2 marks]

8. Triangle ABC has $A = 42^\circ$, $B = 68^\circ$ and $a = 9\,\text{cm}$. [4 marks]



Sketch not to scale

(a) Find C. [2 marks]

(b) Find b. [2 marks]

9. Two triangle sides are 7 cm and 9 cm, with included angle 110°. [4 marks]

(a) Find the third side. [2 marks]

(b) Explain why it is the longest side. [2 marks]

10. Survey stations A and B are 25 m apart on a straight level line. A marker T lies to one side, with $TAB = 40^\circ$ and $TBA = 65^\circ$. [6 marks]

(a) Find ATB and AT. [3 marks]

(b) Find the perpendicular distance from T to line AB. [3 marks]