FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

G2: Constructions and loci

Reason about why constructions work and about loci

20 marks · 25 minutes · Non-calculator

1) Explain why every point on the perpendicular bisector of AB is the same distance from A and B.

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[Question 1: 2 marks]

2) Explain why the standard angle bisector construction splits the angle into two equal parts.

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[Question 2: 2 marks]

3) Ali says he can construct a triangle with sides 3 cm, 4 cm and 8 cm. Explain why he cannot.

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[Question 3: 2 marks]

4) Describe the locus of points 2 cm from a point, and the locus of points 2 cm from a line segment.

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[Question 4: 2 marks]

5) Explain why the perpendicular from a point to a line gives the shortest distance to the line.

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[Question 5: 2 marks]

6) Treasure is buried the same distance from trees *A* and *B*, and 5 m from a rock *C*. Explain how you would find where it could be.

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[Question 6: 2 marks]

7) Explain why the construction of a 60° angle with compasses works.

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[Question 7: 2 marks]

8) Explain why any two triangles with sides 5 cm, 6 cm and 7 cm are congruent.

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[Question 8: 2 marks]

9) A goat is tied to the corner of a rectangular field by a 4 m rope. Describe the region it can graze inside the field.

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[Question 9: 2 marks]

10) Explain why bisecting a right angle gives an angle of 45°.

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[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Explanation	The bisector cuts AB at its midpoint at 90° (C1); congruent triangles give equal distances (C1).
2	Explanation	Equal arcs give two congruent triangles (SSS) (C1); so the angles are equal (C1).
3	Explanation	$3 + 4 < 8$ (M1); the two short sides cannot meet (C1).
4	Explanation	A circle of radius 2 cm (C1); a racetrack shape (C1).
5	Explanation	Any other line is the hypotenuse of a right-angled triangle (C1); so it is longer (C1).
6	Explanation	Perpendicular bisector of AB (C1); intersect with a circle radius 5 m centre C (C1).
7	Explanation	Equal radii make an equilateral triangle (C1); all angles 60° (C1).
8	Explanation	SSS (C2).
9	Quarter circle	Radius 4 m (C1); quarter circle in the corner (C1).
10	Explanation	Splits 90° into two equal angles (C2).