FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G2: Loci

Solve problems involving loci and constructions

20 marks · 25 minutes · Calculator allowed

1) A goat is tied by a 6 m rope to a corner of a 10 m by 8 m shed. It grazes outside the shed. Find the area it can graze.

..... m^2

[Question 1: 3 marks]

2) A is $(0, 0)$ and B is $(6, 0)$. Point P is the same distance from A and B and is 5 units from A. Find the possible positions of P.

.....

[Question 2: 3 marks]

---

3) A 12 m by 8 m garden has a sprinkler at its centre that waters everything within 4 m. Find the area of garden that is not watered.

..... m^2

[Question 3: 3 marks]

---

4) A dog is tied by a 5 m lead to a point on a long straight wall. Find the area the dog can reach.

..... m^2

[Question 4: 2 marks]

---

5) A lighthouse can be seen up to 15 km away. A ship sails in a straight line that passes 9 km from the lighthouse at its closest point. For what distance along its path can the ship see the lighthouse?

..... km

[Question 5: 3 marks]

---

6) Two radio masts are 10 km apart. Each has a range of 6 km. The ranges overlap. How far is each point where the edges of the ranges cross from the midpoint of the two masts?

..... km

[Question 6: 3 marks]

7) Find the perimeter of the locus of points exactly 2 cm from a 6 cm line segment.

..... cm

[Question 7: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	84.8	Three-quarter circle (P1); $\frac{3}{4}\pi \times 36$ (P1); A1.
2	$(3, 4)$ and $(3, -4)$	On $x = 3$ (P1); $3^2 + y^2 = 25$ (P1); A1.
3	45.7	96 (P1); 16π (P1); A1.
4	39.3	Semicircle (P1); A1.
5	24	$\sqrt{15^2 - 9^2} = 12$ (P1, P1); 2×12 (A1).
6	3.32	Right triangle with 5 and 6 (P1, P1); $\sqrt{11}$ (A1).
7	24.6	Two 6 cm lines and two semicircles (P1, P1); $12 + 4\pi$ (A1).