Loci and Construction

Grade 4 topic · Foundation and Higher · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Foundation students: aim for Questions 1–15 (49 marks) and have a go at the rest. Higher students: complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 67 marks.

Warm-up

1 Describe the locus of points that are exactly 3 cm from a fixed point P. **[2 marks]**

Answer _____

2 Describe the locus of points that are the same distance from two fixed points A and B. **[2 marks]**

Answer _____

3 Describe the locus of points equidistant from two lines that meet at a point. **[2 marks]**

Answer _____

4 Describe the locus of points that are less than 5 cm from a point O. **[2 marks]**

Answer _____

5 Describe how to construct the perpendicular bisector of a line AB using a pair of compasses and a straight edge. **[3 marks]**

Answer _____

Core

6 Describe how to construct the bisector of angle ABC. **[3 marks]**

Answer _____

7 Describe how to construct a perpendicular from a point P to a line. **[3 marks]**

Answer _____

8 Describe how to construct an angle of 60°. **[3 marks]**

Answer _____

9 Describe how to construct an equilateral triangle with side 6 cm. **[3 marks]**

Answer _____

10 A goat is tied to a post by a rope 3 m long. Work out the area of grass the goat can reach. Give your answer in terms of π. **[4 marks]**

Answer _____

Stretch

11 A goat is tied to a corner of a straight wall by a 6 m rope, so it can reach a half-circle. Work out the area it can reach in terms of π. **[4 marks]**

Answer _____

12 A radio mast has a range of 30 km. Work out the area it covers in terms of π. **[4 marks]**

Answer _____

13 A sprinkler waters all points within 3 m. Work out the area it waters to 3 significant figures. **[4 marks]**

Answer _____

14 Points that are less than 3 cm from A and also closer to A than to B. Describe how you would shade this region. **[5 marks]**

Answer _____

15 A treasure is buried at a point that is 5 m from a tree T and equidistant from two paths that meet at T. Describe the possible positions. **[5 marks]**

Answer _____

Challenge

16 Draw the locus of points that are 2 cm from a line segment AB of length 6 cm. Describe its shape and calculate its perimeter to 3 significant figures. **[5 marks]**

Answer _____

17 A rectangle is 8 cm by 5 cm. Describe the locus of points inside it that are closer to the long side AB than to the short side BC. **[4 marks]**

Answer _____

18 Two points A and B are 10 cm apart. Describe the locus of points exactly 6 cm from A and 6 cm from B, and how many such points there are. **[5 marks]**

Answer _____

19 Describe the locus of points exactly 6 cm from a fixed point P. **[2 marks]**

Answer _____

20 Describe the locus of points exactly 5 cm from a fixed point P. **[2 marks]**

Answer _____