

GCSE Maths: Combined loci and region problems (Higher): worksheet

GCSE Maths - Loci, Bearings and Vectors - Higher - Lesson 22.5

Name: _____

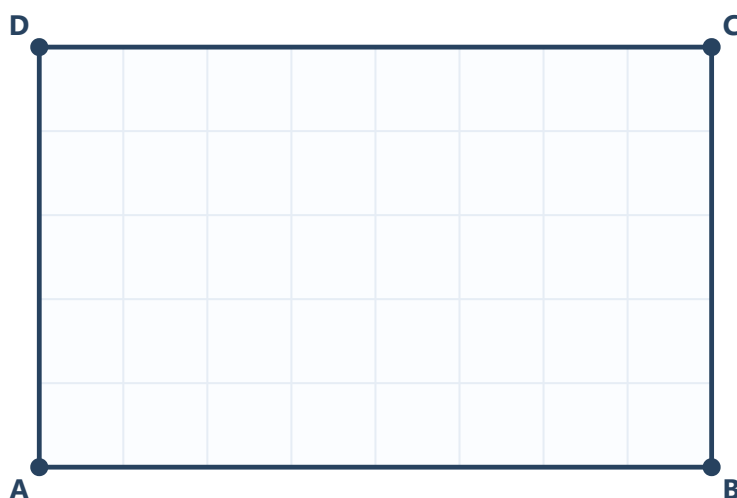
Date: _____

Score: _____

12 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch22-constructions-loci-bearings-vectors/higher/combined-loci-and-region-problems/

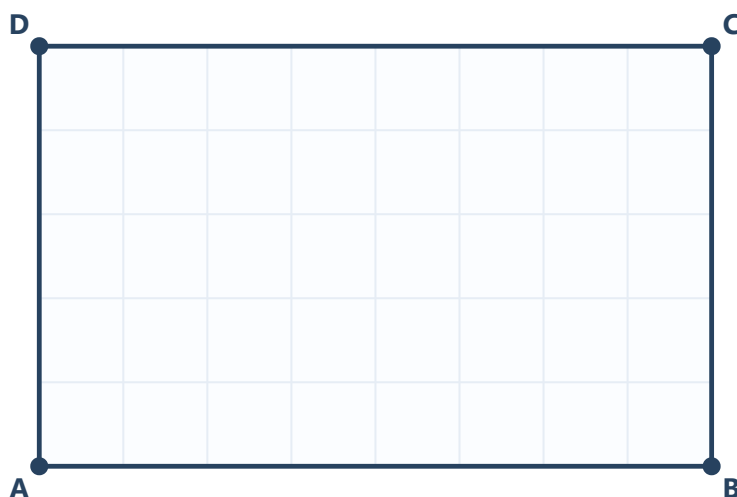
Exercise 22F Region problems Non-calculator

- 1 The plan shows a rectangular garden ABCD with $AB = 8$ m and $AD = 5$ m. Each square is 1 m. Shade the region that is **within 4 m of A** and **within 2 m of side AB**.



Answer: _____

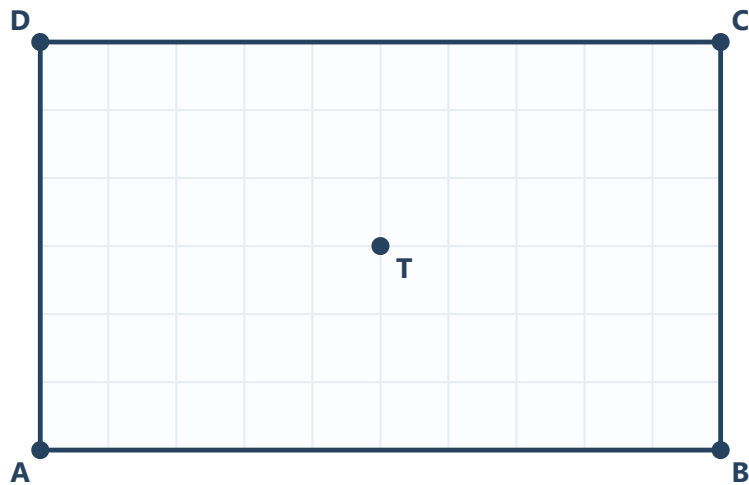
- 2 The plan shows a rectangular garden ABCD. Each square is 1 m. Shade the region that is **within 5 m of C** and **nearer to C than to D**.



Answer: _____

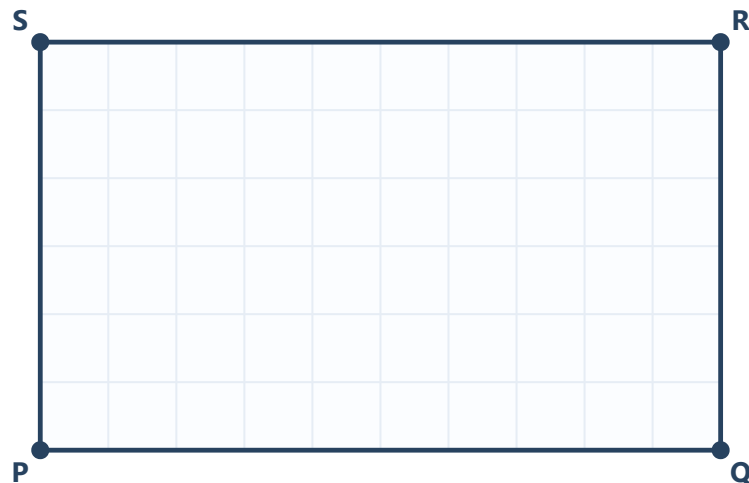
- 3 A school playground ABCD is 10 m by 6 m and a tree T stands in the middle. Each square on the plan is 1 m. A bench is placed **within 4 m of T**, **nearer to side AB than to side DC** and **at least 1 m from side AD**.

Shade the region where the bench could go.



Answer:

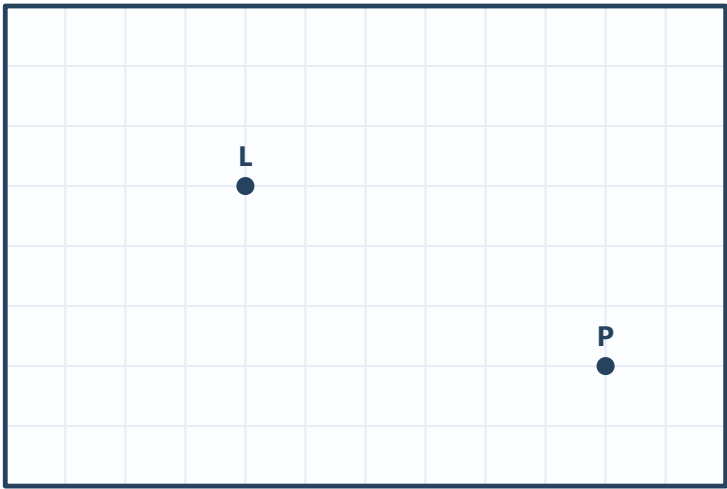
- 4 A rectangular field PQRS is 10 m by 6 m. Each square on the plan is 1 m. A flag is placed **within 6 m of Q, at least 2 m from side PS, and nearer to side RS than to side RQ**. Shade the region where the flag can be placed.



Answer:

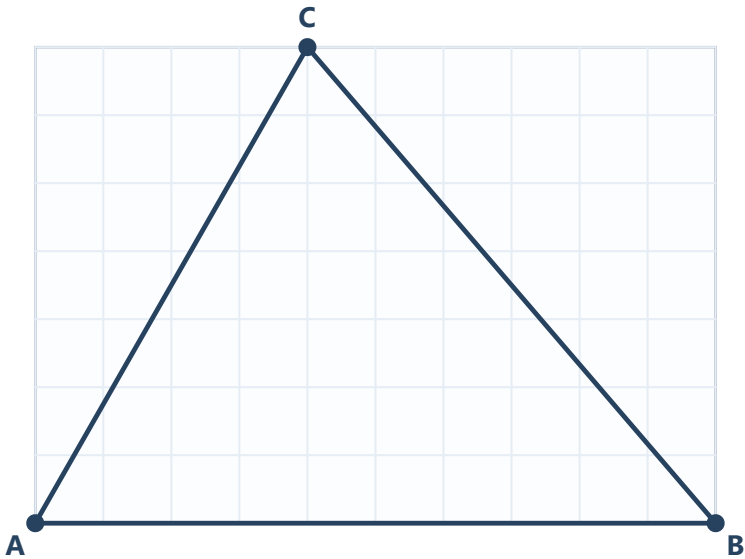
- 5 A lighthouse L and a port P are shown on a sea chart. Each square is 1 km. A ship is **within 5 km of L, nearer to P than to L, and at least 2 km from the straight coastline AB**. Shade the region where the ship could

be.



Answer:

- 6 A triangular plot ABC is shown on a grid where each square is 1 m. A well is dug **within 7 m of B**, **nearer to C than to A**, and **at least 1.5 m from side AB**. Shade the region where the well could be.



Answer:

- 7 Use the garden ABCD (A at the origin, AB along the x-axis, AD along the y-axis, each unit 1 m). The region is **within 4 m of A** and **nearer to AB than to AD**. Is each point in the region?

(a) (3, 2)
Answer:

(b) (1, 3)
Answer:

(c) (3.5, 3)
Answer:

(d) (4, 1)
Answer:

- 8 Aisha says: “It is impossible for a point to be within 2 cm of A and at least 5 cm from A.” Is she right? Explain.

Answer:

- 9 Points A and B are 10 cm apart. A point must be within 3 cm of A **and** within 3 cm of B. Show that there is no such point.

Answer:

- 10 In the garden problem (the region within 4 m of A and nearer to AB than to AD), the region is a sector of a circle of radius 4 m with an angle of 45° . Work out its area to 2 decimal places.

Answer:

- 11 A map has a scale of 1 : 50 000. A lighthouse can be seen up to 20 km away. On the map, a boat must be **within the range of the lighthouse**. Work out the radius of the circle that shows the range on the map, in cm.

Answer:

- 12 **Challenge.** A is the point (0, 0) and B is the point (8, 0). Work out the area of the region that is **within 5 units of A** and **nearer to B than to A**. Give your answer correct to 2 decimal places.

Answer:
