

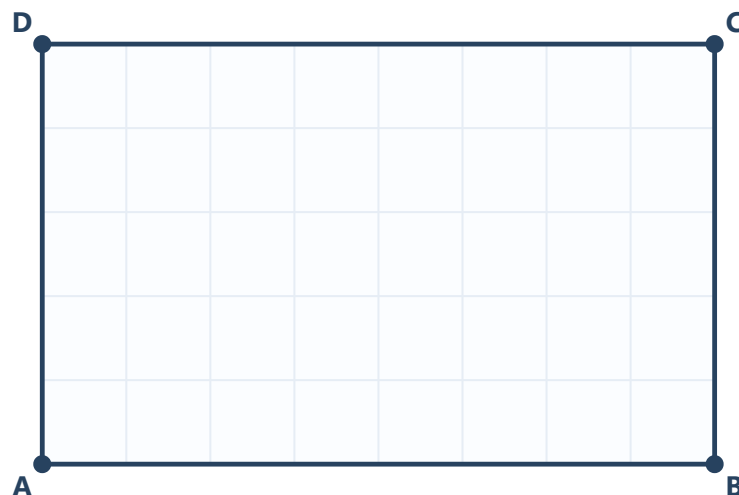
GCSE Maths: Combined loci and region problems (Higher): answers

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

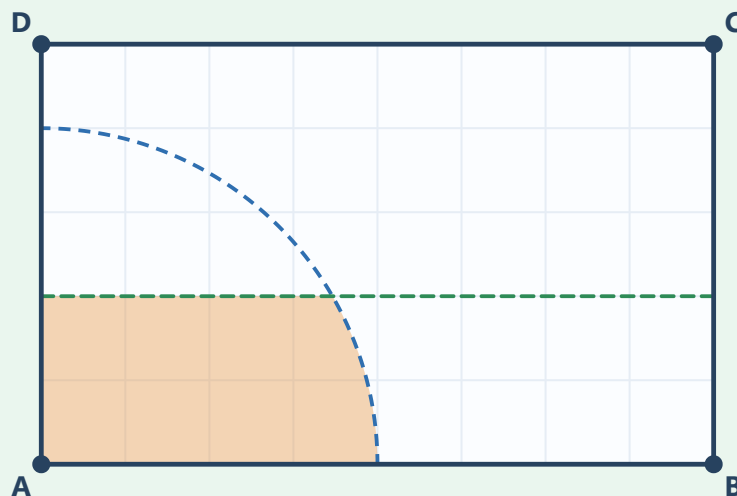
Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch22-constructions-loci-bearings-vectors/higher/combined-loci-and-region-problems/

Exercise 22F Region problems Non-calculator

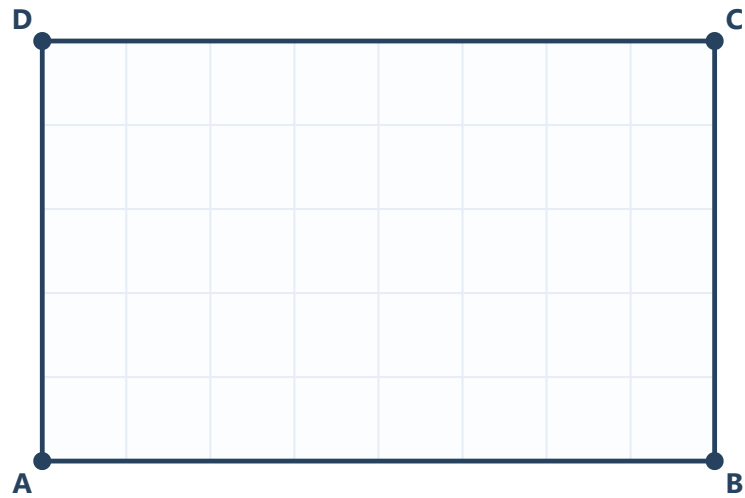
- 1 The plan shows a rectangular garden ABCD with $AB = 8$ m and $AD = 5$ m. Each square is 1 m. Shade the region that is **within 4 m of A** and **within 2 m of side AB**.



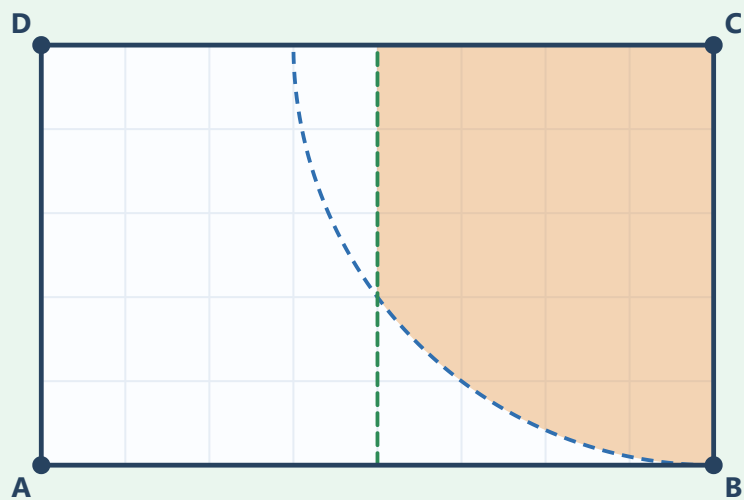
Answer: The shaded region in the solution diagram (about 8 m^2)



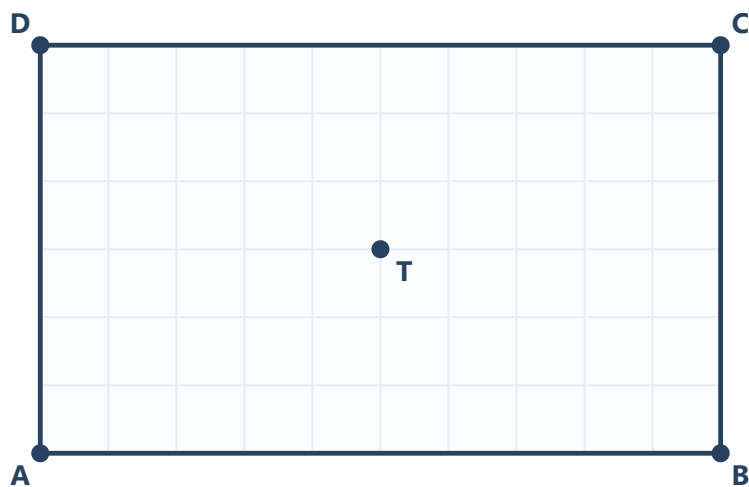
- 2 The plan shows a rectangular garden ABCD. Each square is 1 m. Shade the region that is **within 5 m of C** and **nearer to C than to D**.



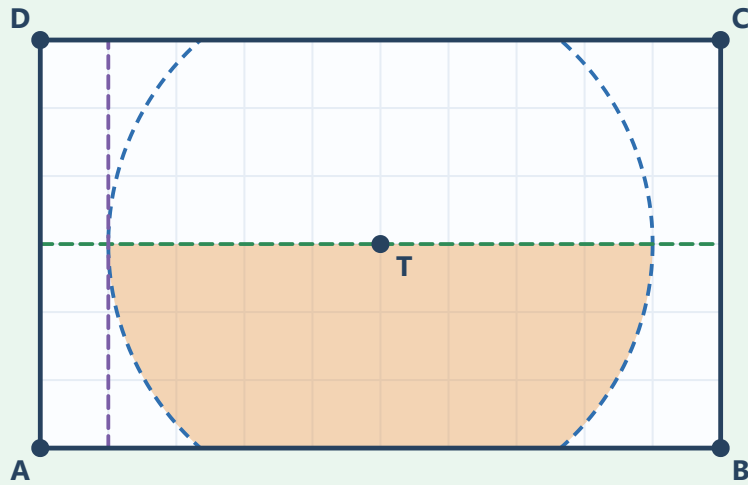
Answer: The shaded region in the solution diagram (about 18 m²)



- 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.



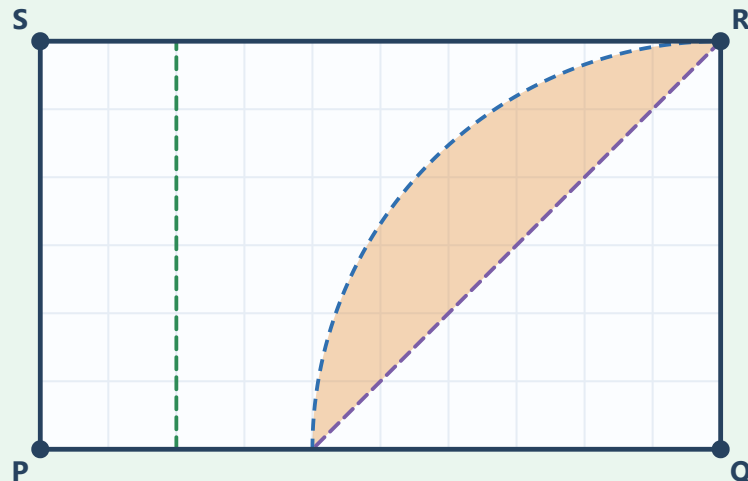
Answer: The shaded region in the solution diagram (about 22 m²)



- 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.

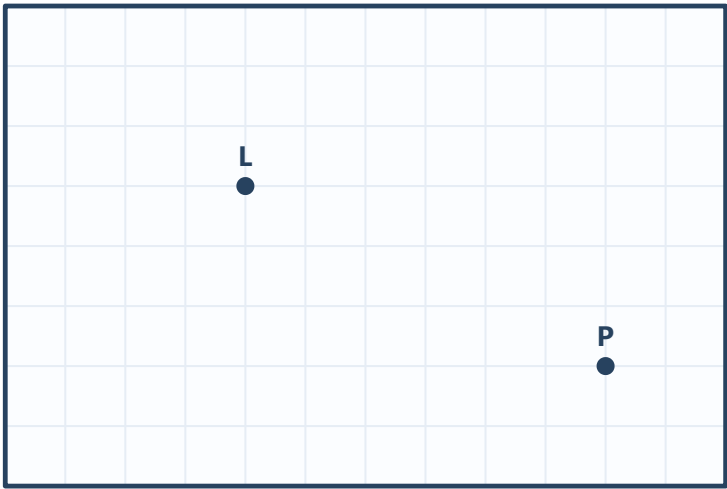


Answer: The shaded region in the solution diagram (about 11 m²)

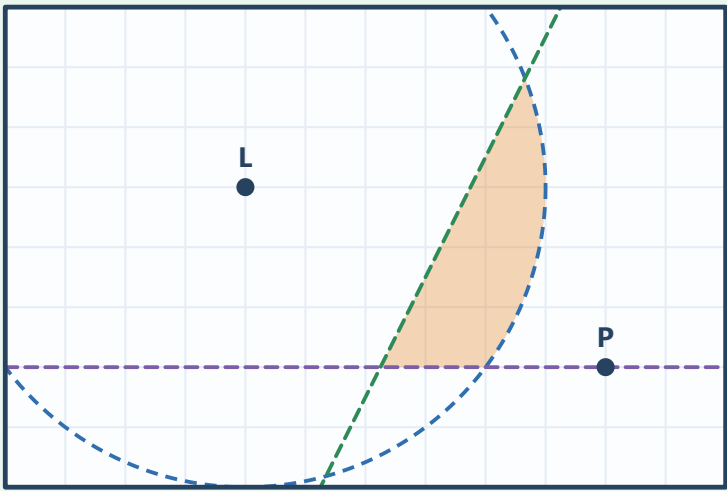


- 5 A lighthouse L and a port P are shown on a sea chart. Each square is 1 km. A ship is **within 5 km of L**, **nearer to P than to L**, and **at least 2 km from the straight coastline AB**. Shade the region where the ship could

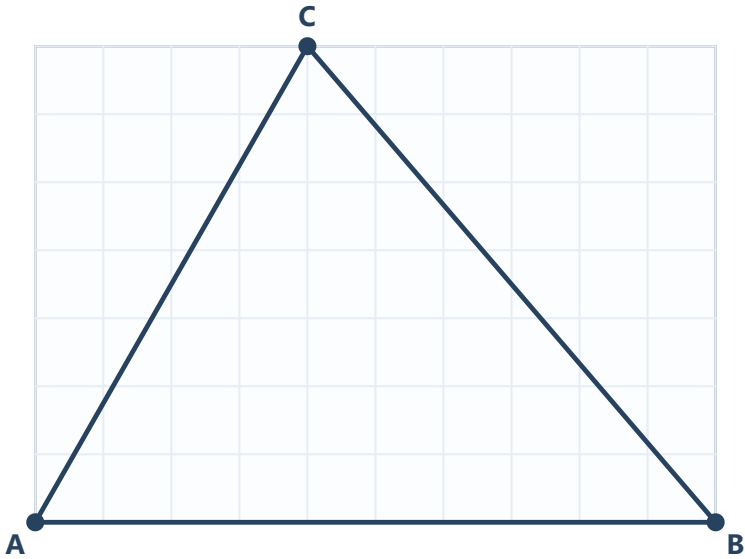
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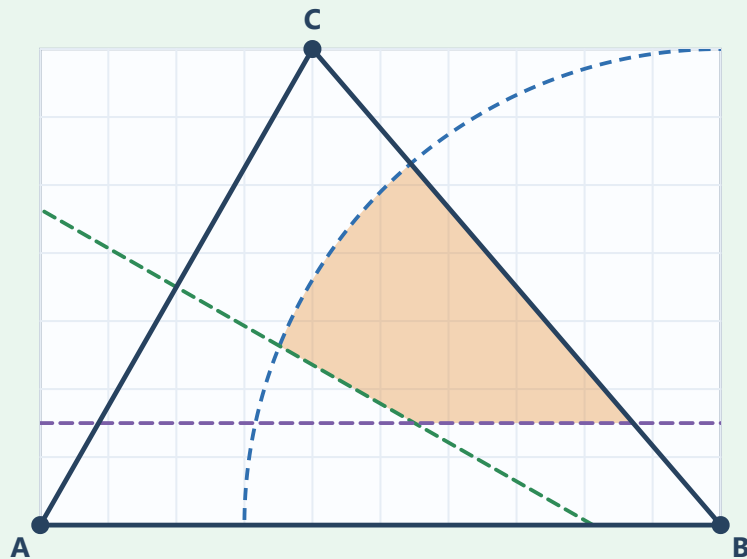
Answer: The shaded region in the solution diagram (about 6 m²)



- 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: The shaded region in the solution diagram (about 10 m^2)



- 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: Yes, in the region

(b) (1, 3)

Answer: No, not in the region

(c) (3.5, 3)

Answer: No, not in the region

(d) (4, 1)

Answer: No, not in the region

- 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: Yes, no point can be both.

- 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: $3 + 3 = 6 < 10$

- 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: 6.28 m^2

- 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: 40 cm

- 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: 4.09 square units

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