Planner

Loci

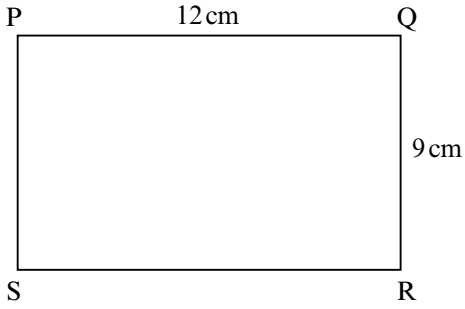
- Solving problems involving loci

Keywords

You should know

explanation 1a | explanation 1b | explanation 1c | explanation 1d | online

1 The diagram shows rectangle PQRS.

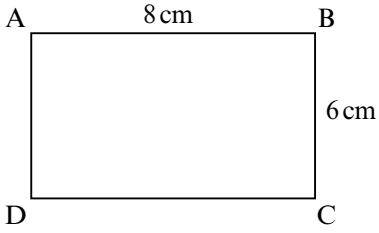


a Draw an accurate copy of the rectangle PQRS.

b Construct the locus of points that are exactly 6 cm from P.

c Construct the locus of points that are less than 5 cm from R.

2 The diagram shows rectangle ABCD.

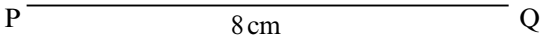


a Draw an accurate copy of the rectangle ABCD.

b Draw the locus of points that are equidistant from AB and AD.

c Shade the region in the rectangle to show the locus of points that are closer to AB than AD.

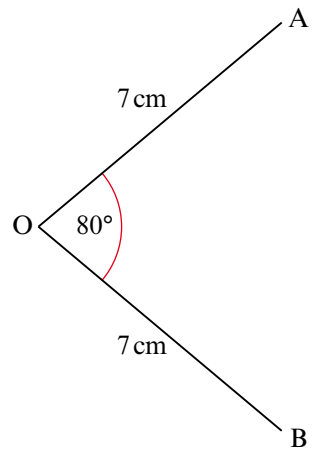
3 The diagram shows the line PQ.



a Draw an accurate copy of the line PQ.

b Construct the locus of points that are equidistant from P and Q.

4 The diagram shows angle AOB.



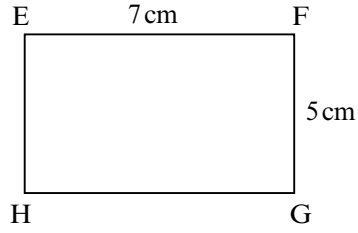
a Copy the diagram.

b Construct the locus of points that are equidistant from OA and OB.

c Construct the locus of points that are 5 cm from O.

d Shade the region to show the locus of points that are closer to OA than OB and less than 5 cm from O.

5 The diagram shows rectangle EFGH.



a Draw an accurate copy of the rectangle EFGH .

b Construct the locus of points that are within the rectangle and are 4 cm from E.

c Construct the locus of points that are within the rectangle and are 3 cm from H.

d Shade the region to show the locus of points that are within the rectangle and are less than 4 cm from E and less than 3 cm from H.

6 This question is about an equilateral triangle.

a Draw an equilateral triangle ABC with sides of length 7 cm.

b Construct the locus of points that are equidistant from AB and AC.

c Construct the locus of points that are equidistant from A and B.

d Shade the region within the triangle to show the locus of points that are closer to AB than AC and closer to A than B.

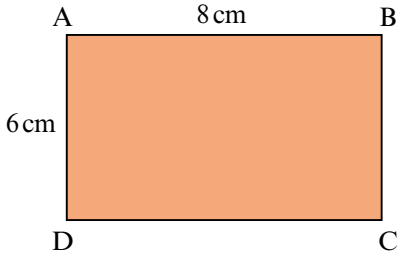
7 **a** Draw a line PQ that is 5 cm in length.

b Construct the locus of points that are exactly 2 cm from PQ.

c Construct the locus of points that are exactly 3 cm from P.

d Shade the region to show the locus of points that are less than 2 cm from PQ and more than 3 cm from P.

8 Each part in this question refers to the rectangle ABCD.



Draw a new rectangle for each part of the question.

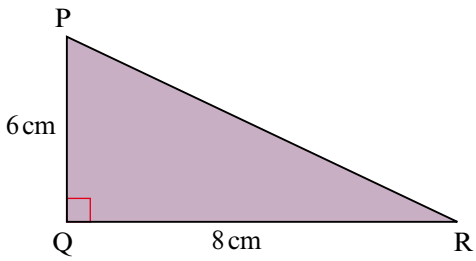
Find the loci of these points that lie inside the rectangle.

a Points less than 4 cm from A and less than 7 cm from B.

b Points that are closer to AD than AB and more than 3 cm from D.

c Points that are more than 4 cm from DC and more than 3 cm from A.

9 Each part in this question refers to the triangle PQR.



Draw a new triangle for each part of the question.

Find the loci of these points that lie inside the triangle.

a Points that are closer to PQ than PR and more than 2 cm from QR.

b Points less than 2 cm from QR and less than 3 cm from PQ.

c Points that are more than 4 cm from P and more than 5 cm from R.

explanation 2a explanation 2b

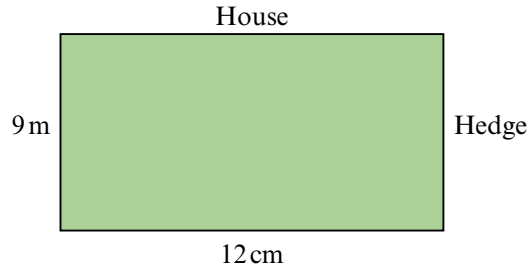
10 Alncaster and Birchover are 120 km apart.

There is a radio transmitter at both Alncaster and Birchover. The range of the transmitter at Alncaster is 80 km. (Its signal cannot be received by points more than 80 km away.)

The range of the transmitter at Birchover is 90 km.

Using a scale of 1 cm to 10 km, draw an accurate diagram to show the locus of points that can receive a signal from both transmitters.

11 The diagram represents Mrs Martin's garden.



The house and a hedge make up two sides of the garden.

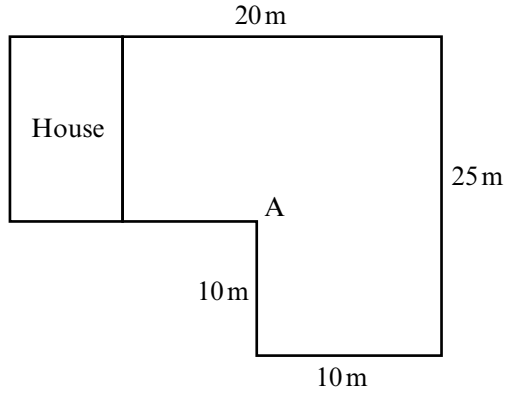
Mrs Martin wants to make a flower bed that is further than 6 m from the house and further than 5 m from the hedge.

a Use a scale of 1 cm to 1 m to draw an accurate diagram of the rectangle.

b Shade the locus of all the points where the flower bed could be.

12 Two lighthouses P and Q are 200 km apart. It is known that a ship is closer to Q than P and that it is less than 80 km away from P. Use a scale of 1 : 2 000 000 to show accurately the locus of all points of the possible position of the ship.

13 The diagram shows a garden.

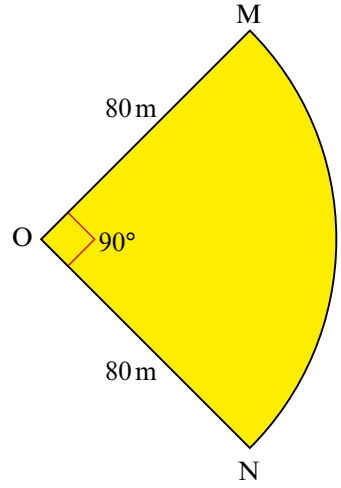


a Using a scale of 1 : 500 draw a scale diagram of the garden.

b There is a dog tethered at point A by a lead that is 6 m long. The owner wishes to plant a tree in such a position so that the dog cannot reach the tree. The tree also needs to be at least 12 m from the house.

Shade the locus of all the points where the tree could be planted.

14 The diagram represents a sector of a circle marked out in a field.



Karen stands at the point O and throws a ball.

The ball lands within the sector in a position that is closer to OM than ON.

The ball is also more than 50 m but less than 70 m from O.

Use a scale of 1 : 1000 to make a scale drawing. Show the locus of all the points where the ball could have landed.