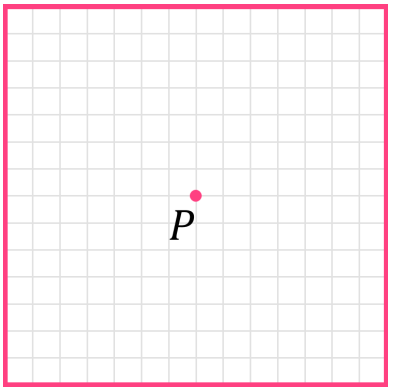
Loci - Worksheet

Skill

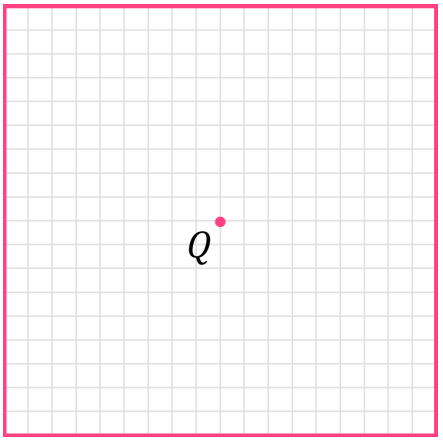
Group A - Drawing a locus of points

Draw the locus of points required. Each square on the following diagrams represents $0.5cm$:

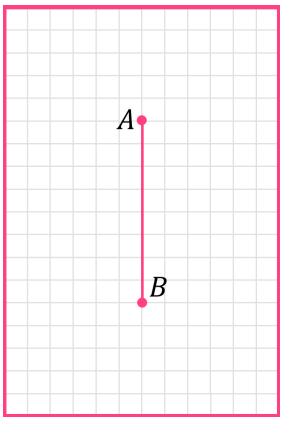
1) Points $3\ cm$ from point P



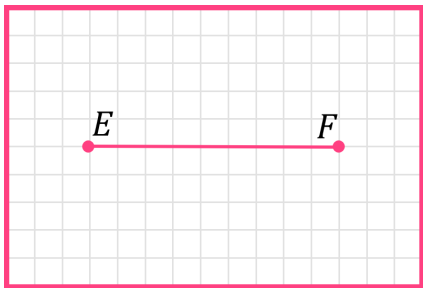
2) Points $4\ cm$ from point Q



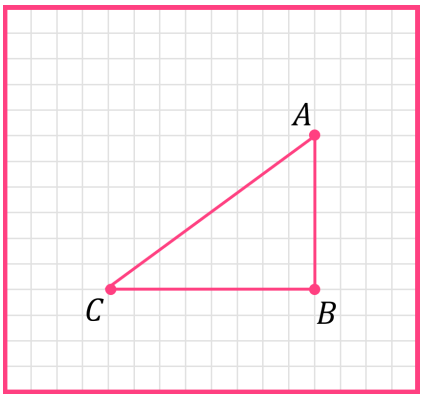
3) Points $2\ cm$ from line segment AB



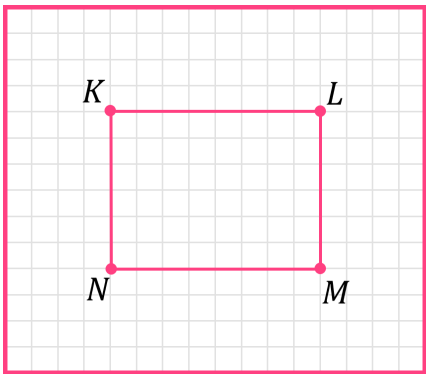
4) Points $3\ cm$ from the line EF



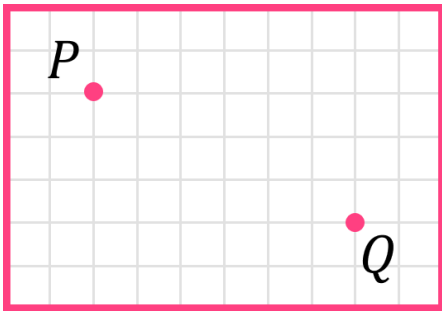
5) Points $3\ cm$ from triangle ABC



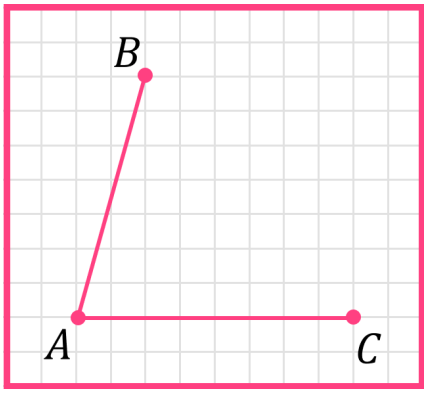
6) Points $2\ cm$ from rectangle KLMN



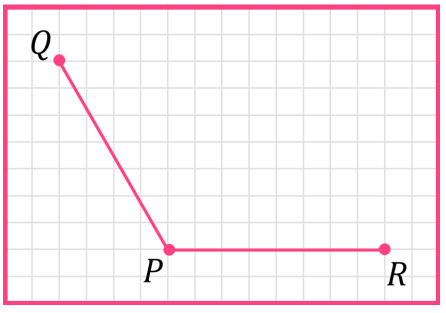
7) Points equidistant from points P and Q



8) Points equidistant from the lines AB and AC



9) Points equidistant from the lines PQ and PR



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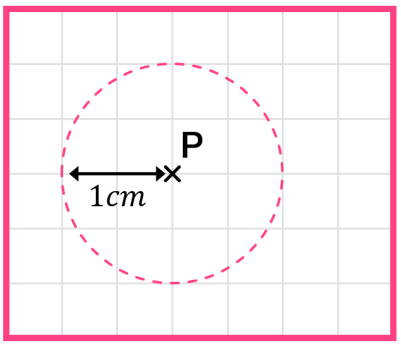
Loci - Worksheet

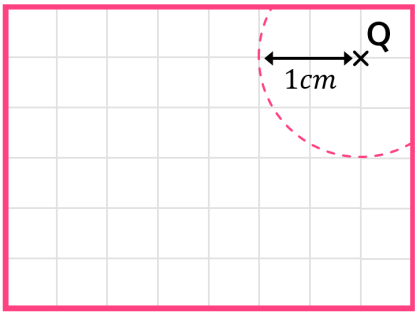
Group B - Shading required regions from a locus of points

Shade the region required from the loci drawn:

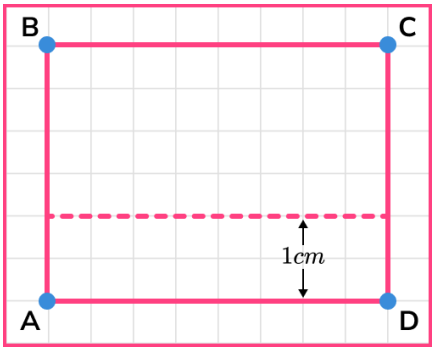
1) Within 1 cm of P



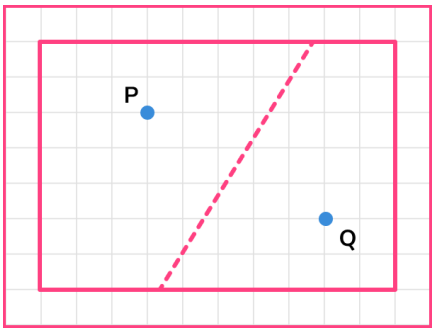
2) More than 1 cm from Q



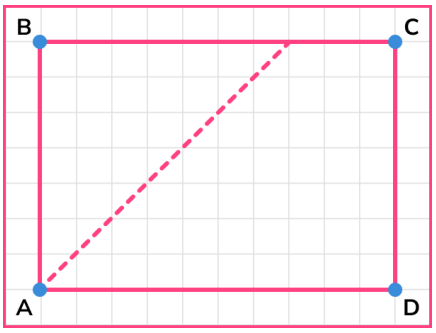
3) Within 1 cm of AD



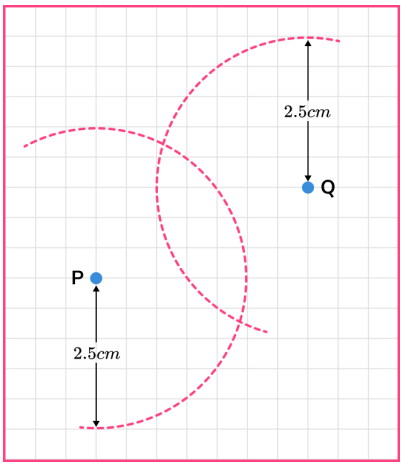
4) Closer to Q than P



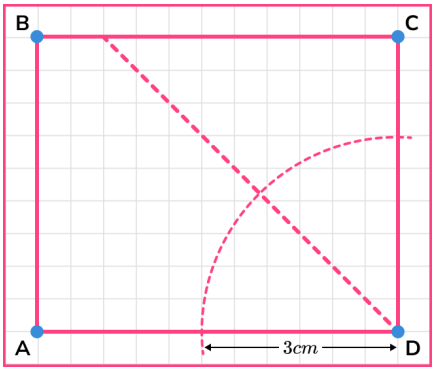
5) Closer to AB than AD



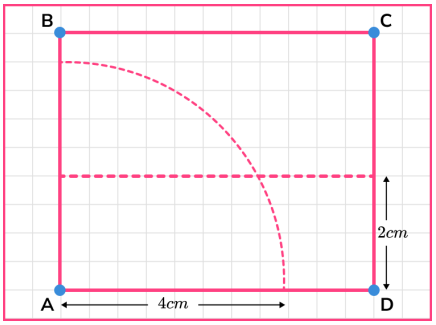
6) Less than 2. 5 cm from P and less than 2. 5 cm from Q



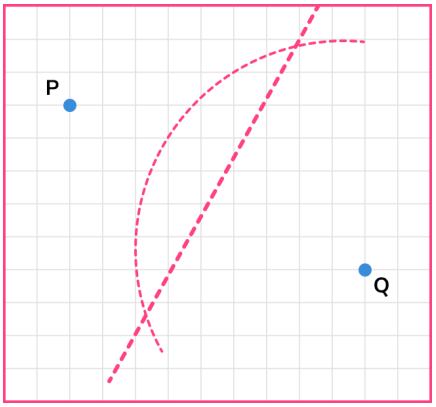
7) Closer to AD than DC and within 3 cm of D



8) More than 2 cm from AD but less than 4 cm from A



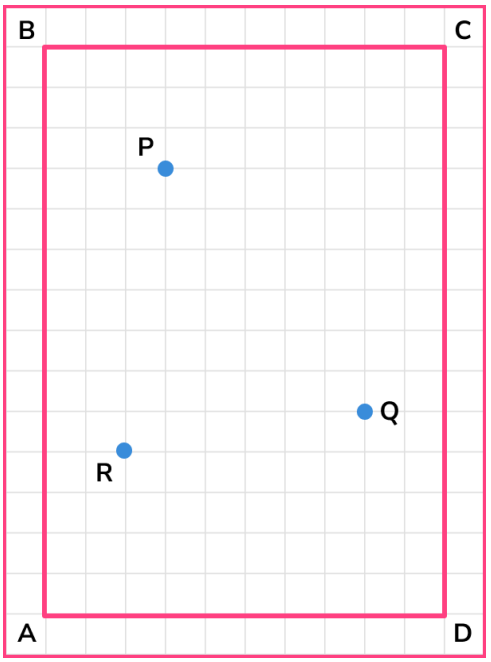
9) Closer to P than Q but less than 3. 5 cm from Q



Loci - Worksheet

Group C - Drawing loci and shading regions

On copies of the diagram, draw/shade the appropriate loci/regions:



1 square = $0.5cm$

1) Less than $3\ cm$ from P but within $2\ cm$ of CD

2) $3\ cm$ from BC and closer to CD than AD

3) Less than $3\ cm$ from R and less than $4\ cm$ from C

4) Equidistant from P and Q and within $4\ cm$ of A

5) Equidistant from A and C but more than $2\ cm$ from Q

6) More than $4\ cm$ from D and more than $4\ cm$ from B

7) Closer to AD than AB and more than $1\ cm$ from Q

8) Within $2\ cm$ of R, within $2\ cm$ of Q and within $3\ cm$ of P

9) Less than $4\ cm$ from A, less than $3\ cm$ from Q but more than $5\ cm$ from B

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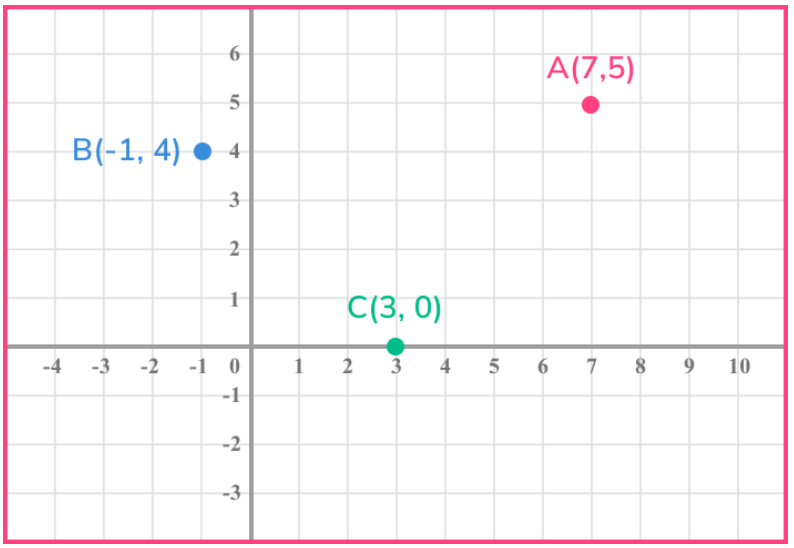
Loci - Worksheet

Applied

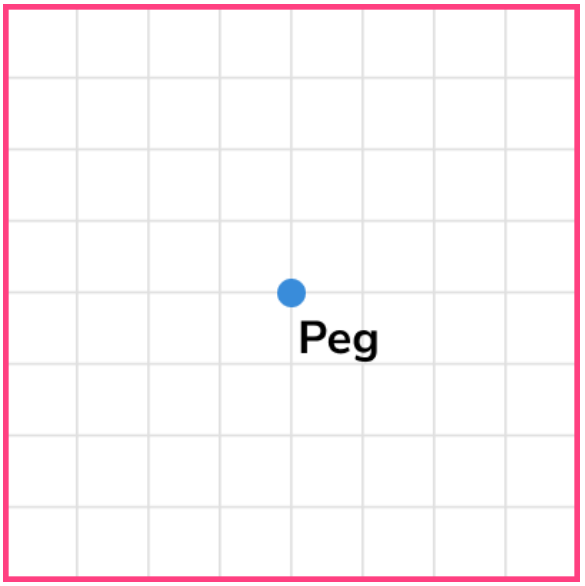
1)



a) On a copy of the diagram, mark the integer coordinates which are equidistant from B and C.

b) On a copy of the diagram, mark the integer coordinates which are within 3 units of B, within 4 units of C and within 8 units of A.

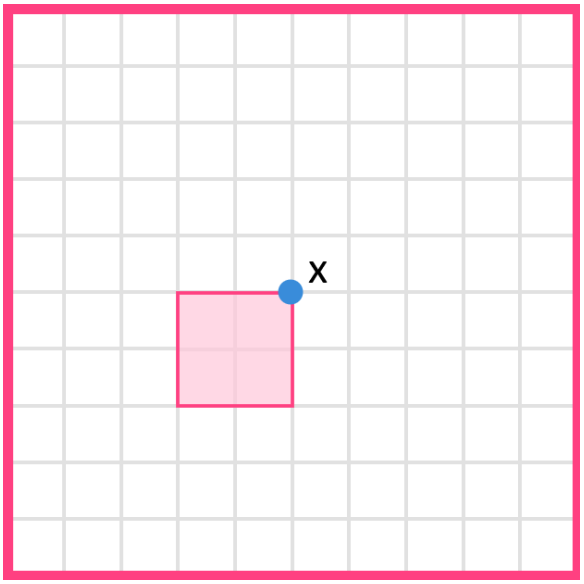
2) **a)** A farmer ties a goat to a post in the ground in the middle of a field. The rope connecting the goat to the post is 4 metres long. Using a scale of 1 square is 1 metre, show the region of grass that can be eaten by the goat.



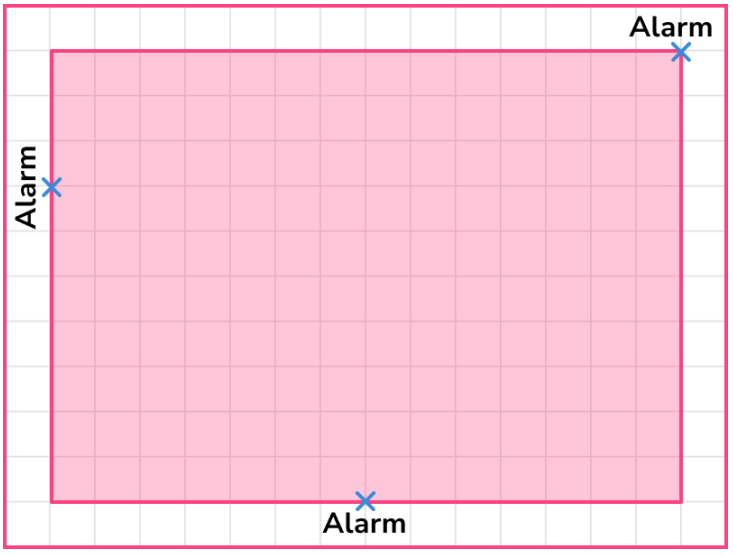
Loci - Worksheet

b) The farmer then moves the goat and ties it to the corner of a shed, which has a base in the shape of a 2 metre by 2 metre square. The x marks the corner where the goat is tied and the rope remains 4 metres long.

Using a scale of 1 square is 1 metre, show the region of grass that can be eaten by the goat.



3) a) A gardener is trying to stop a fox digging in his allotment by using some fox alarms. A fox alarm plays a sound which scares the fox if movement is detected within a 3 metre range. The diagram shows the places where the gardener has placed the alarms. Show on the diagram where the fox can dig undetected. Use a scale of 1 square to 1 metre.



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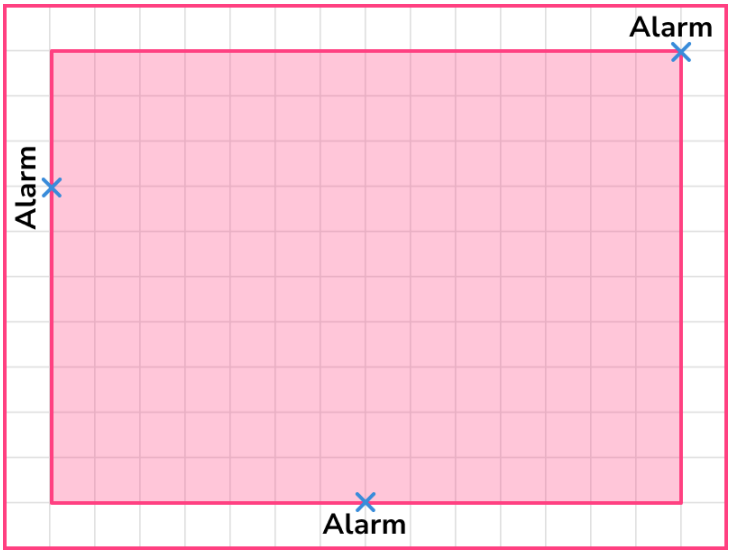
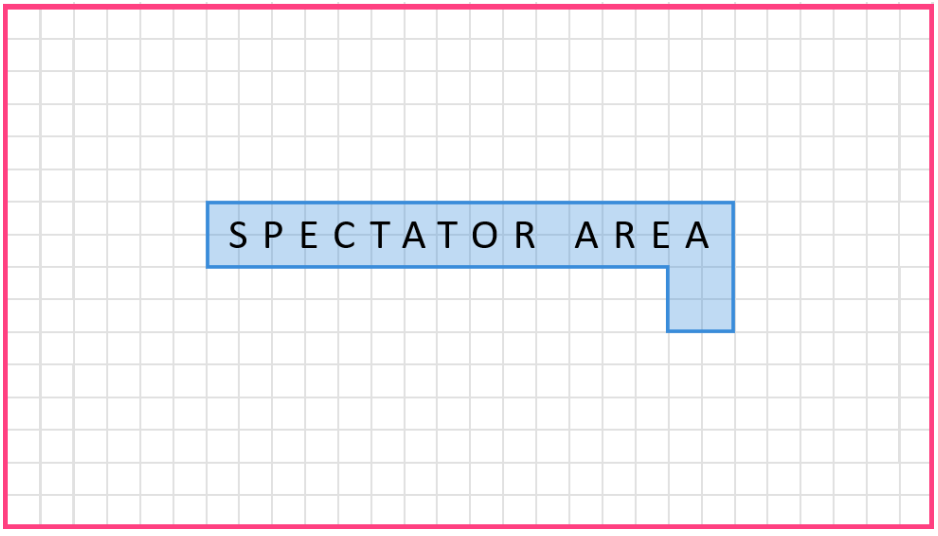
Loci - Worksheet

b) The gardener finds an improved fox alarm with a range of 4 metres. On another copy of the diagram, show that these new alarms will protect his whole allotment.

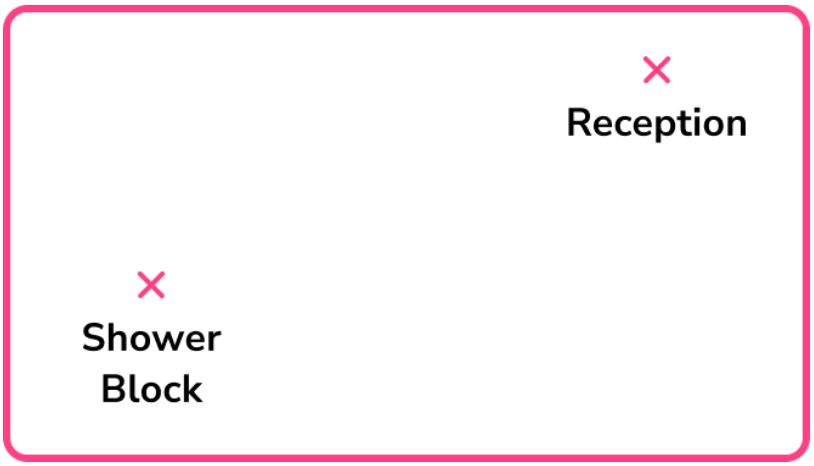


4) A go kart race track is being designed. The diagram shows the spectator area. The race track will be within 10 metres of the spectator area but no closer than 5 metres of the spectator area. Using a scale of 1 cm to 5 metres, show the area where the track will be.



Loci - Exam Questions

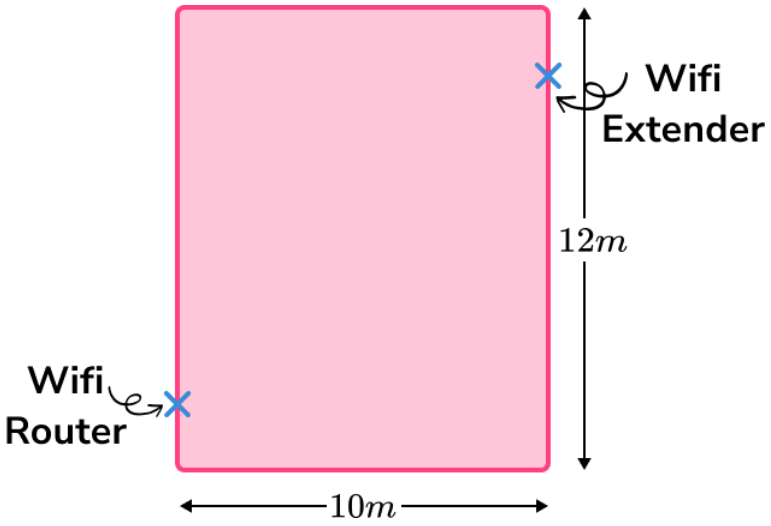
1) A campsite needs to install a new water tap. It must be closer to reception than the shower block, but within 30 metres of the shower block. Using a scale of 1 *cm* to 5 metres. Indicate the region where the water tap can be installed.



(3 marks)

---

2) The diagram shows positions of a wifi router and wifi extender in a floor plan of a single storey house. The wifi router has a range of 8 metres and the wifi extender has a range of 6 metres. Show on the diagram the regions where the wifi router and wifi extender do not reach. Use a scale of 1cm to 2 metres.



(3 marks)

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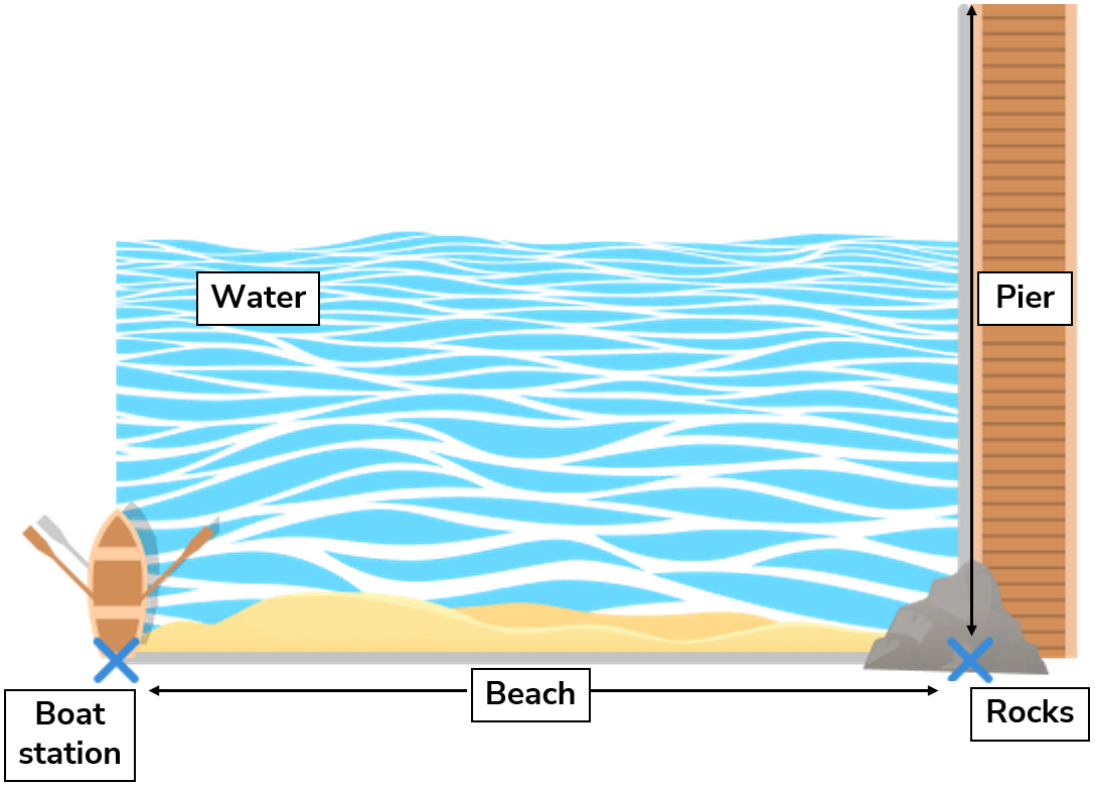
Loci - Exam Questions

3) The diagram shows the plan of a beach and pier. The town's council wants to section off some areas of the beach and water for activities and safety. They plan to use floating ropes to mark the areas that are safe for swimming and the areas that are for peddle boats only.

Swimmers must stay 20 metres away from the rocks and be closer to the beach than the pier. They must also stay 30 metres away from the boat station.

Show on the diagram, using a scale of 1 cm to 10 metres, the region that is safe for swimmers.



(4 marks)

Loci - Exam Questions

4) The diagram shows a rectangle. On the diagram draw the locus of the points that are 2 *cm* from the perimeter of the rectangle.

(3 marks)

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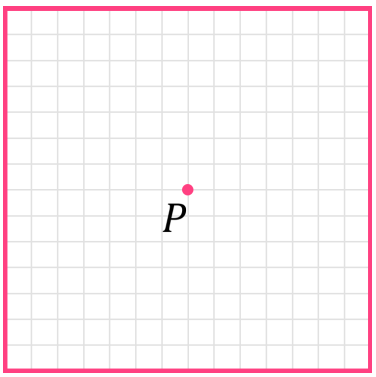
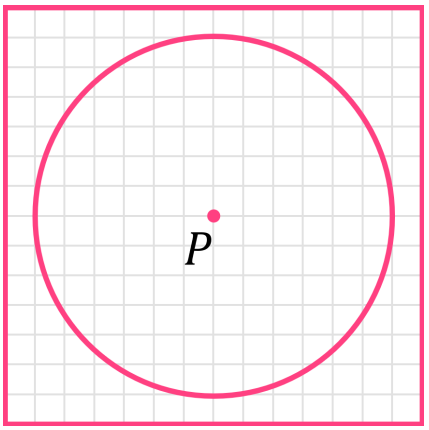
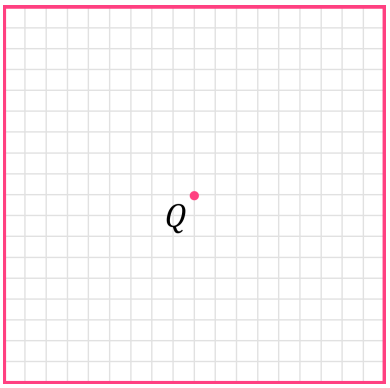
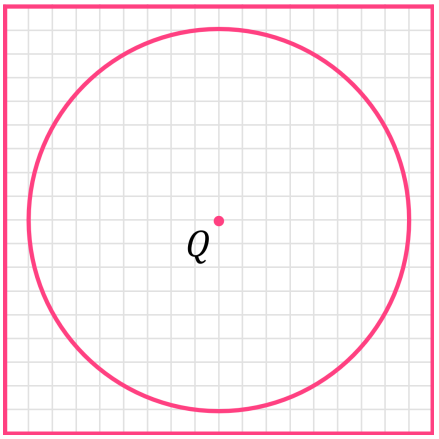
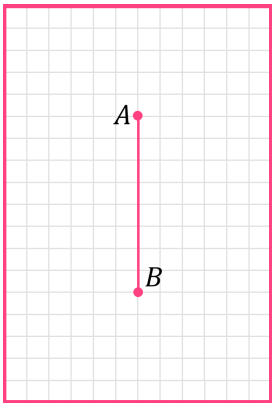
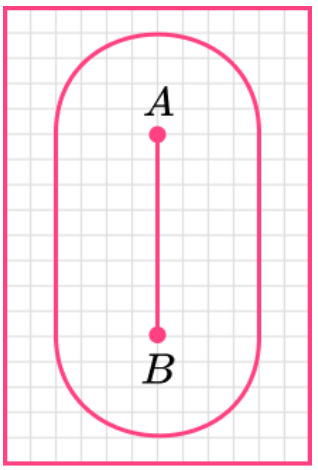
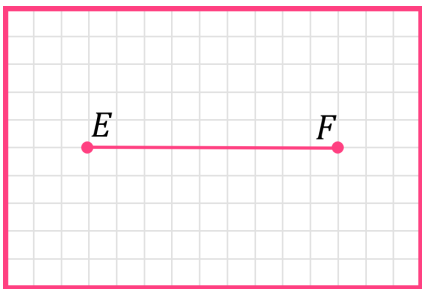
Loci - Answers

	Question	Answer
	Skill Questions	
Group A	Draw the locus of points required. Each square on the following diagrams represents $0.5cm$:	
	1) Points $3\ cm$ from point P 	**1)** 
	2) Points $4\ cm$ from point Q 	**2)** 
	3) Points $2\ cm$ from line segment AB 	**3)** 

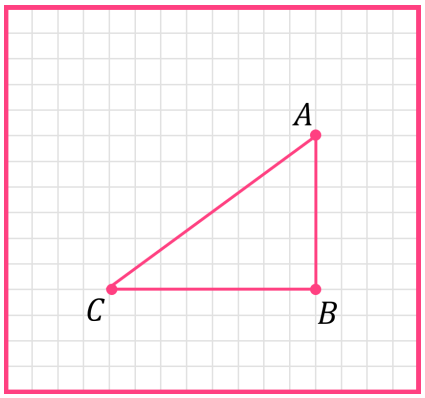
Loci - Answers

Group A contd

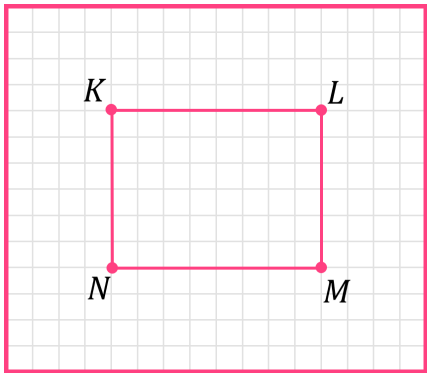
4) Points 3 cm from the line EF



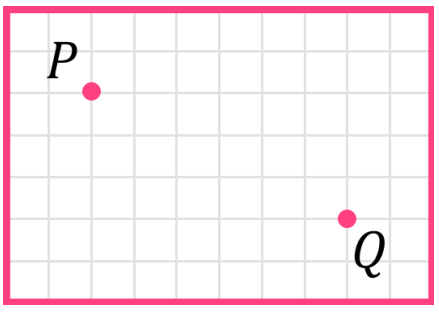
5) Points 3 cm from triangle ABC



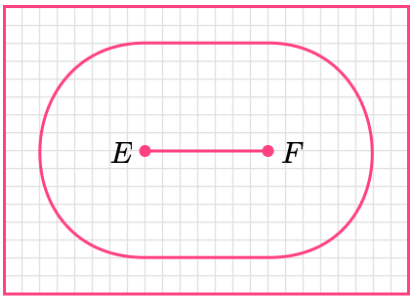
6) Points 2 cm from rectangle KLMN



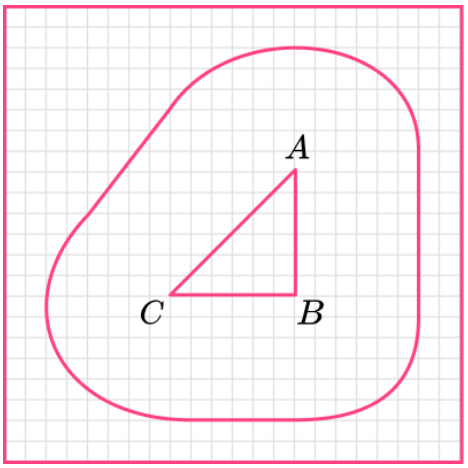
7) Points equidistant from points P and Q



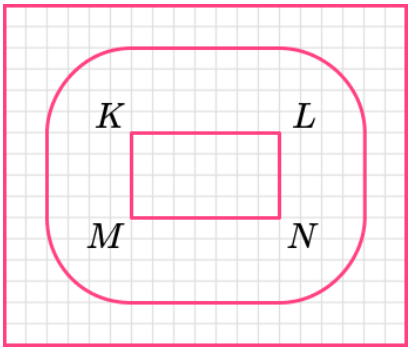
4)



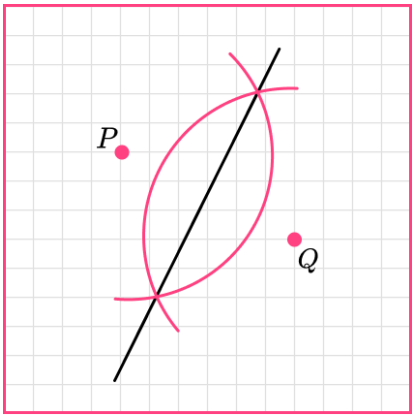
5)



6)



7)



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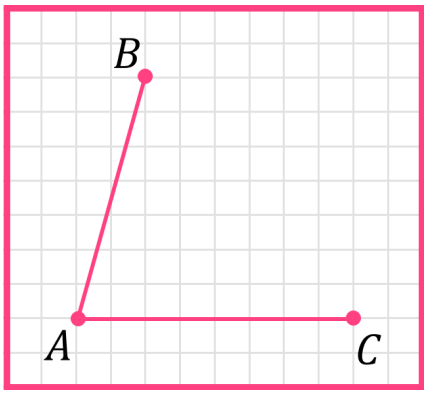
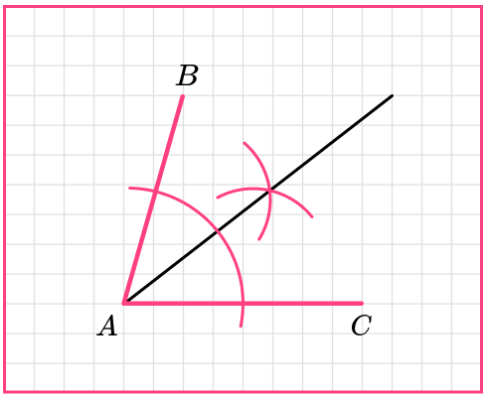
Loci - Answers

Group A contd

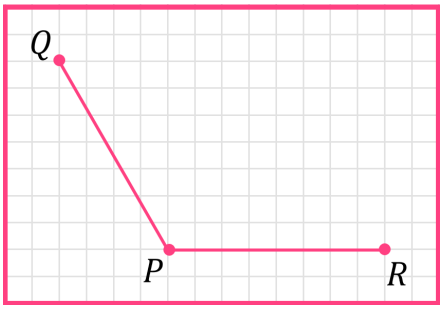
8) Points equidistant from the lines AB and AC



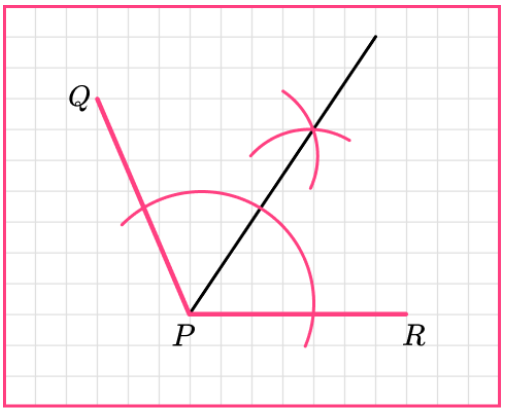
8)



9) Points equidistant from the lines PQ and PR



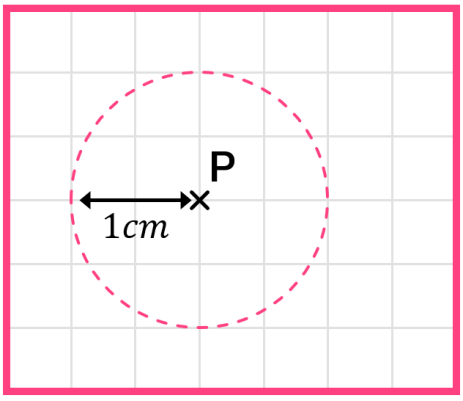
9)



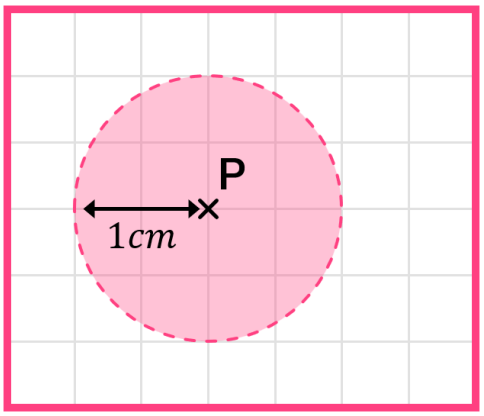
Group B

Shade the region required from the loci drawn, use the template sheet provided:

1) Within 1 cm of P



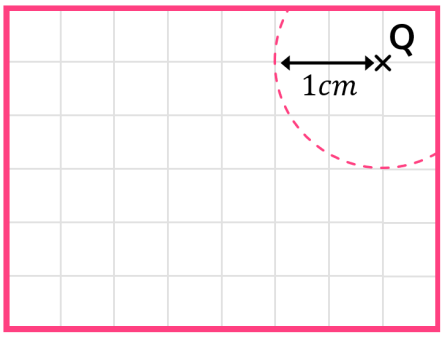
1)



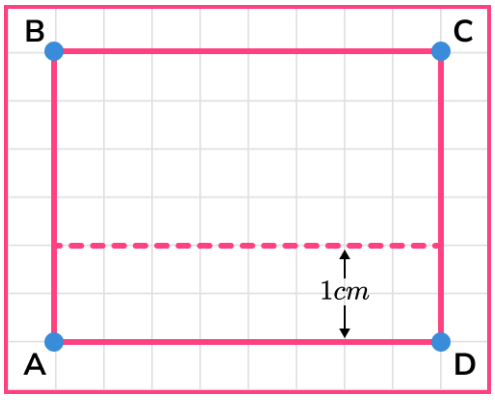
Loci - Answers

Group B contd

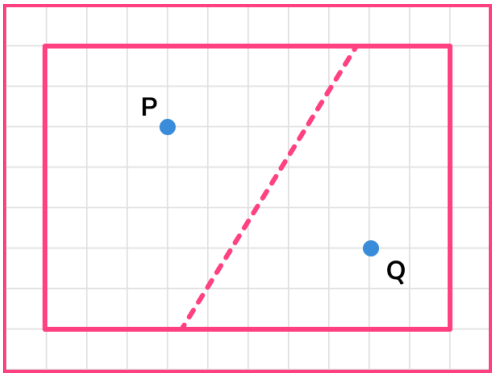
2) More than 1 cm from Q



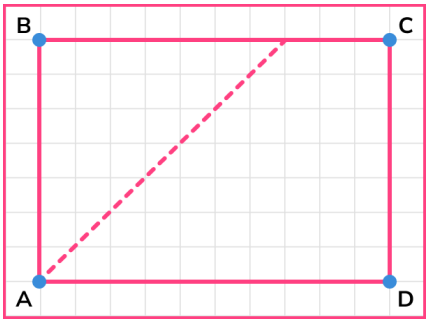
3) Within 1 cm of AD



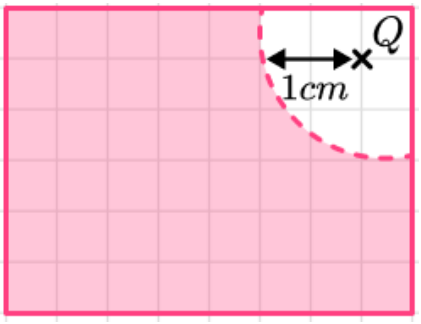
4) Closer to Q than P



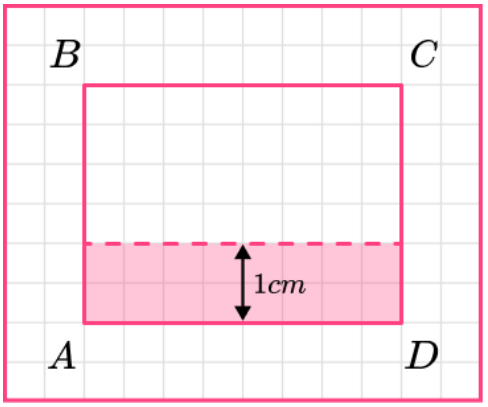
5) Closer to AB than AD



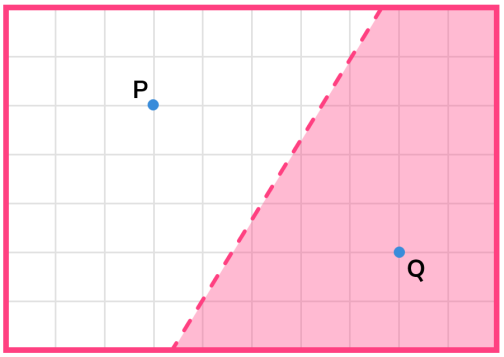
2)



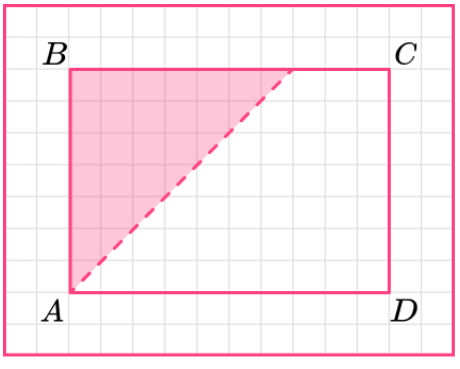
3)



4)



5)



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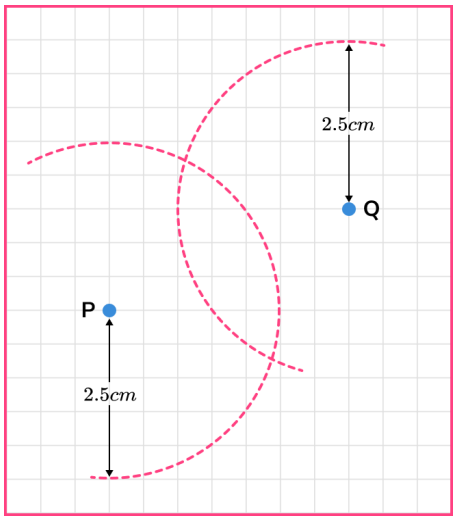
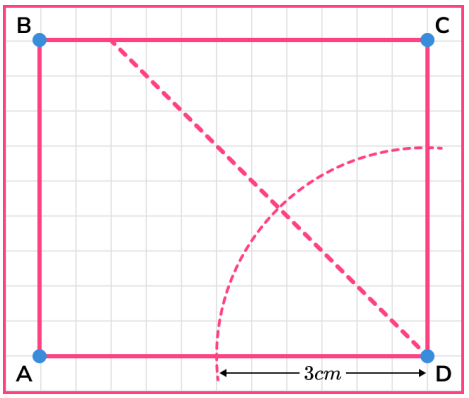
Loci - Answers

Group B contd

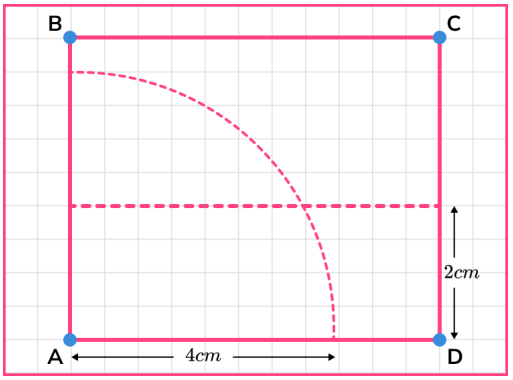
6) Less than 2.5 cm from P and less than 2.5 cm from Q



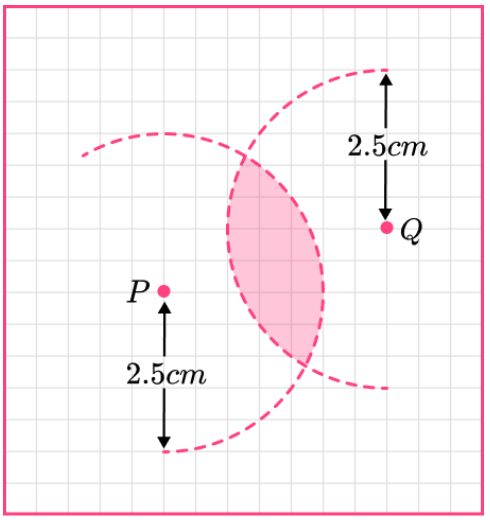
7) Closer to AD than DC and within 3 cm of D



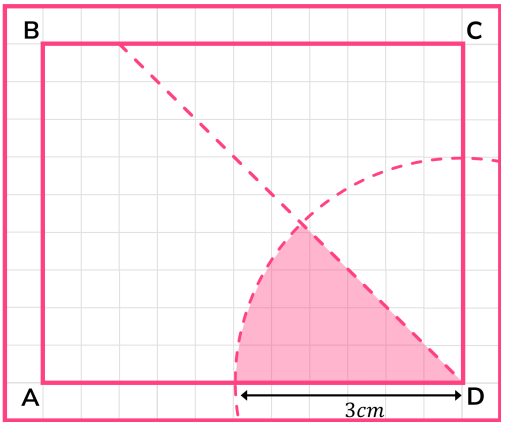
8) More than 2 cm from AD but less than 4 cm from A



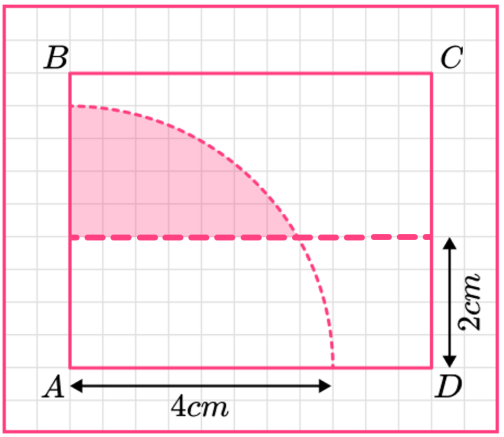
6)



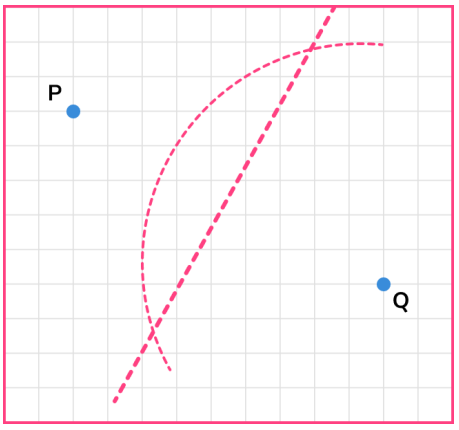
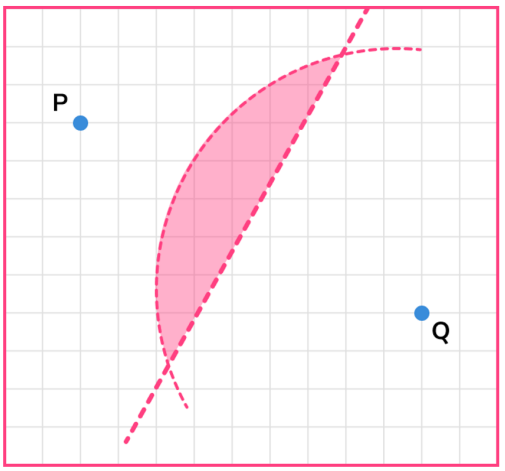
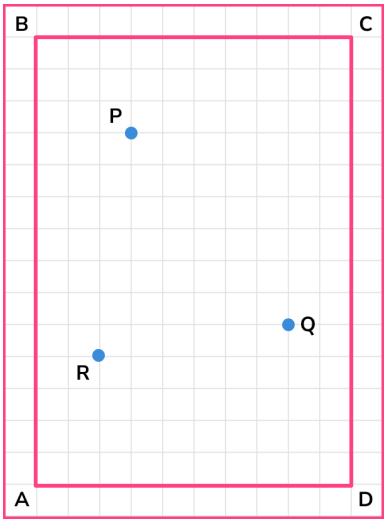
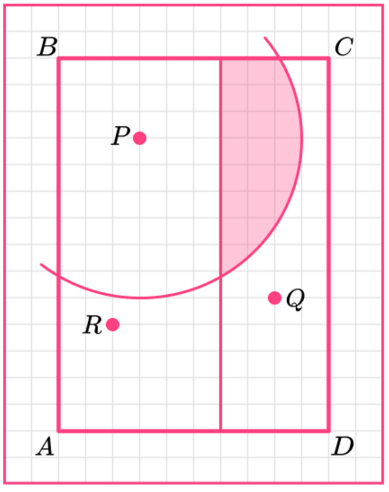
7)



8)



Loci - Answers

	9) Closer to P than Q but less than $3.5\ cm$ from Q 	**9)** 
Group C	On copies of the diagram, draw/shade the appropriate loci/regions:  **1)** Less than $3\ cm$ from P but within $2\ cm$ of CD	**1)** 

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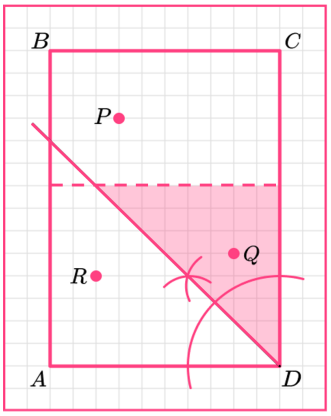
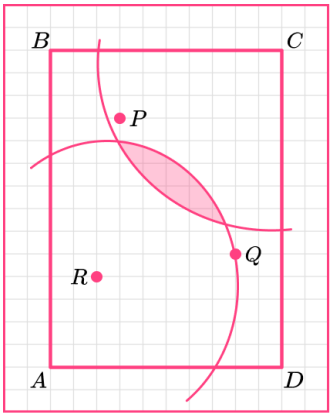
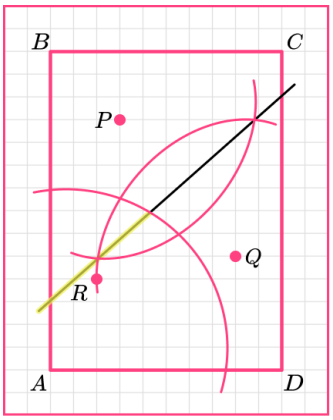
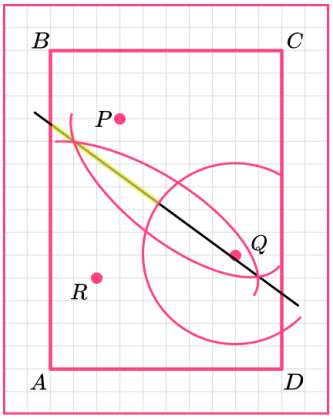
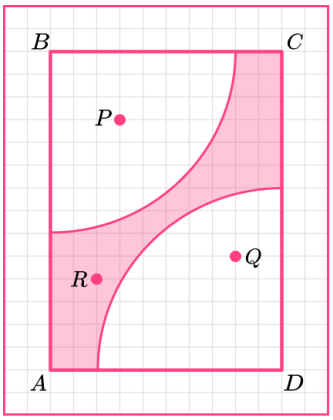
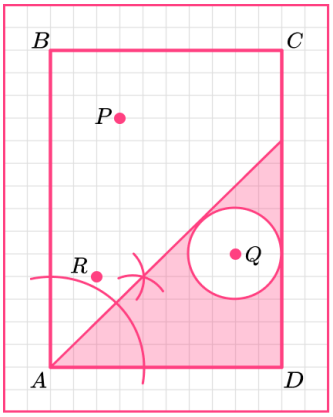
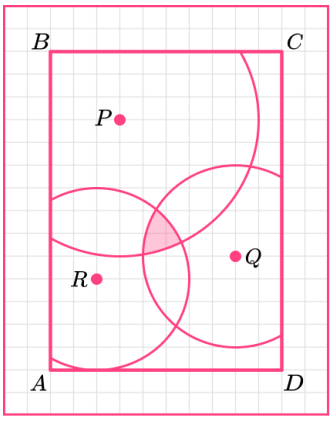
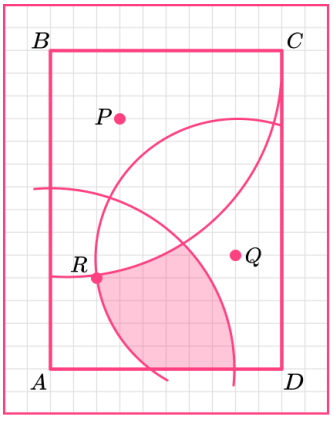
Loci - Answers

Group C contd	**2)** 3 cm from BC and closer to CD than AD	**2)** 
	3) Less than 3 cm from R and less than 4 cm from C	**3)** 
	4) Equidistant from P and Q and within 4 cm of A	**4)** 
	5) Equidistant from A and C but more than 2 cm from Q	**5)** 

Loci - Answers

Group C contd	**6)** More than 4 cm from D and more than 4 cm from B	**6)** 
	7) Closer to AD than AB and more than 1 cm from Q	**7)** 
	8) Within 2 cm of R, within 2 cm of Q and within 3 cm of P	**8)** 
	9) Less than 4 cm from A, less than 3 cm from Q but more than 5 cm from B	**9)** 

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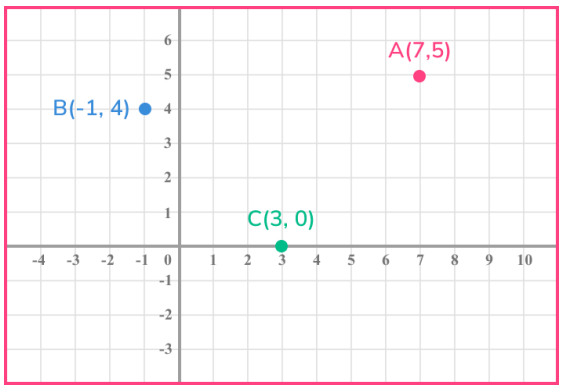
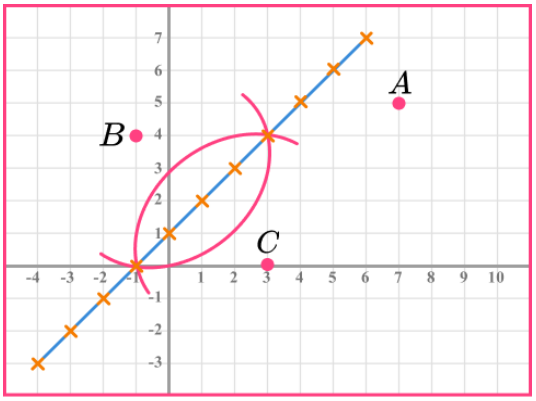
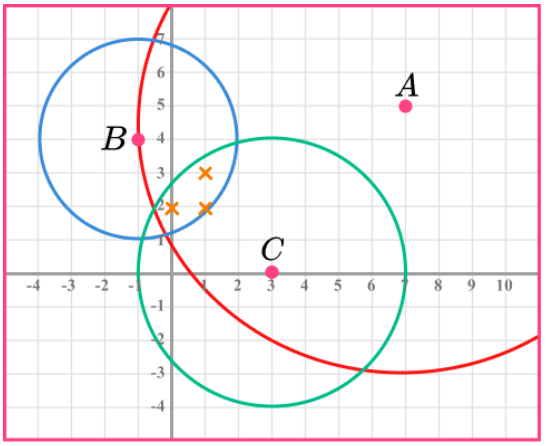
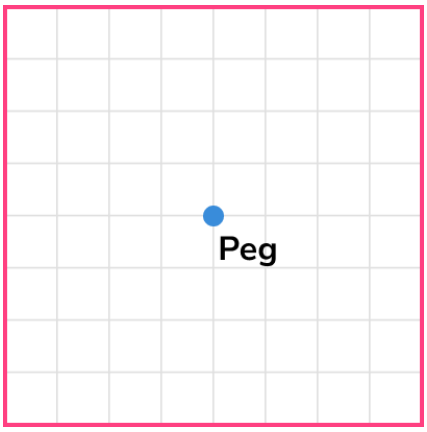
Loci - Answers

	Question	Answer
	Applied Questions	
1)		
	a) On a copy of the diagram, mark the integer coordinates which are equidistant from B and C.	**a)** 
	b) On a copy of the diagram mark, the integer coordinates which are within 3 units of B, within 4 units of C and within 8 units of A.	**b)** 

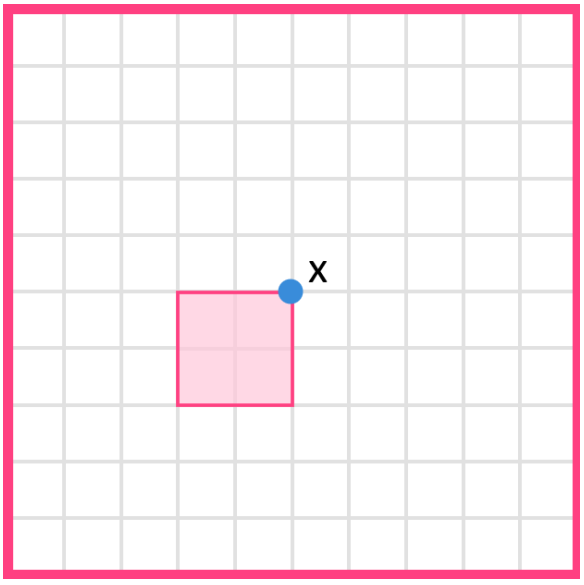
Loci - Answers

2)

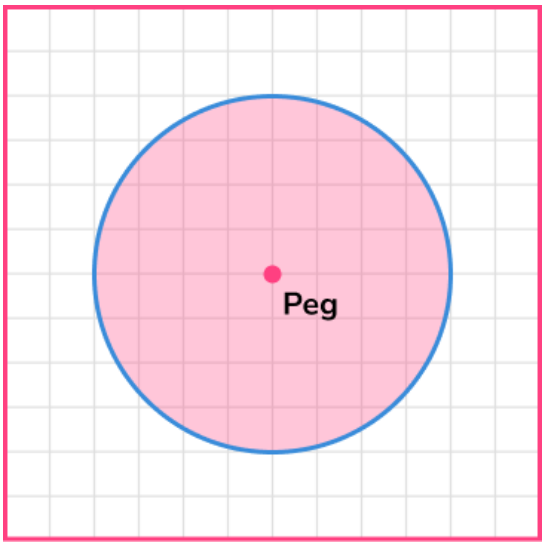
a) A farmer ties a goat to a post in the ground in the middle of a field. The rope connecting the goat to the post is 4 metres long. Using a scale of 1 square is 1 metre, show the region of grass that can be eaten by the goat.



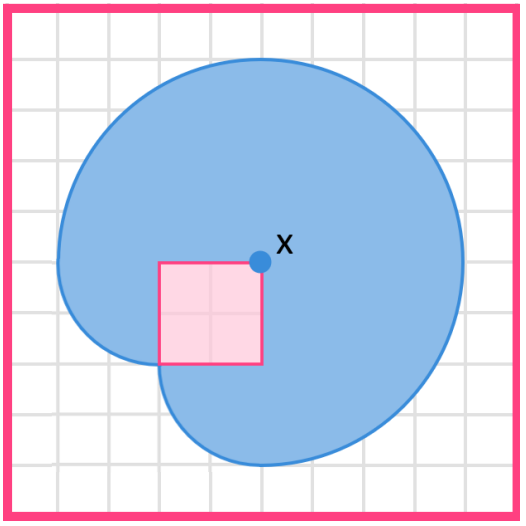
b) The farmer then moves the goat and ties it to the corner of a shed, which has a base in the shape of a 2 metre by 2 metre square. The (X) marks the corner where the goat is tied and the rope remains 4 metres long. Using a scale of 1 square is 1 metre, show the region of grass that can be eaten by the goat.



a)



b)



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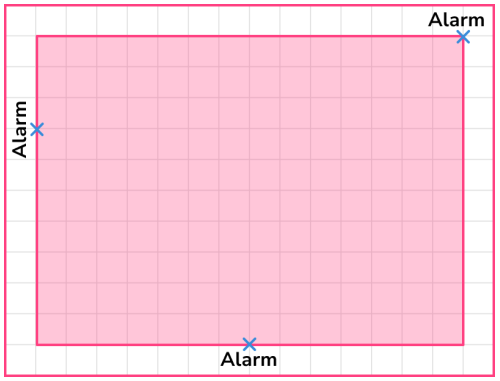
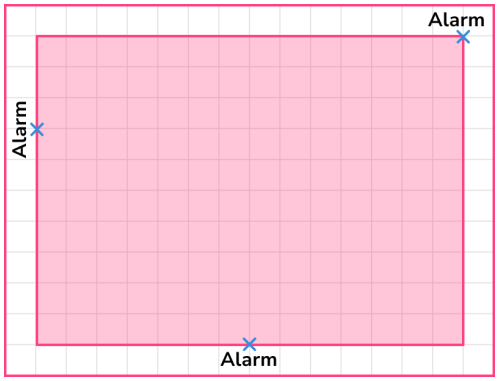
Loci - Answers

3)

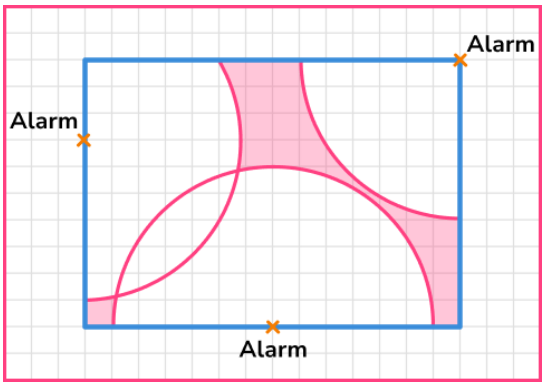
a) A gardener is trying to stop a fox digging in his allotment by using some fox alarms. A fox alarm plays a sound which scares the fox if movement is detected within a 3 metre range. The diagram shows the places where the gardener has placed the alarms. Show on the diagram where the fox can dig undetected. Use a scale of 1 square to 1 metre.



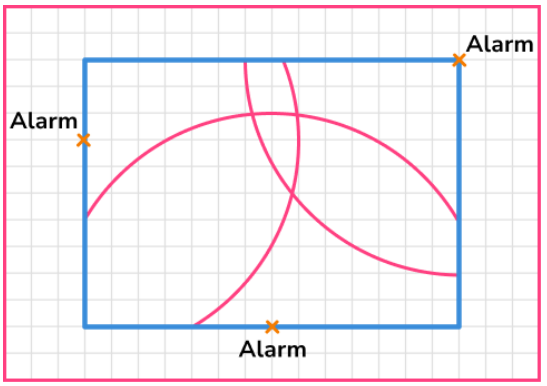
b) The gardener finds an improved fox alarm with a range of 4 metres. On another copy of the diagram, show that these new alarms will protect his whole allotment.



a)

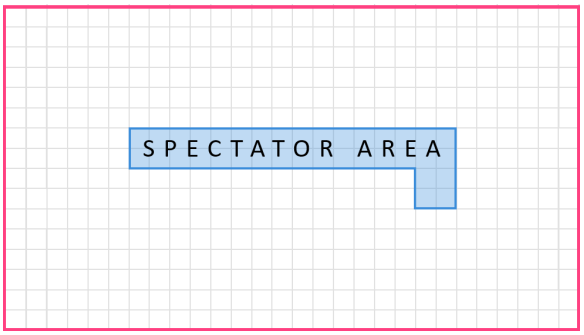


b)

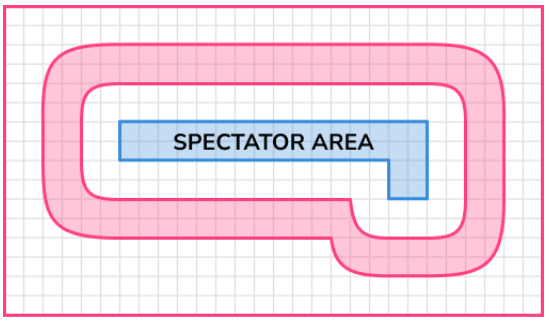


Loci - Answers

4) A go kart race track is being designed. The diagram shows the spectator area. The race track will be within 10 metres of the spectator area but no closer than 5 metres of the spectator area. Using a scale of 1 cm to 5 metres, show the area where the track will be.



4)



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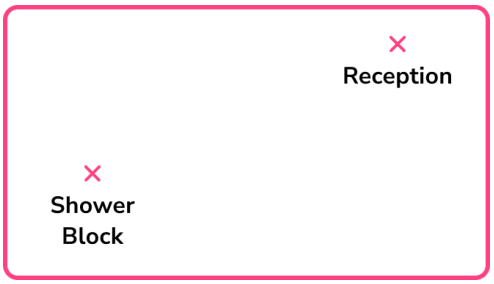
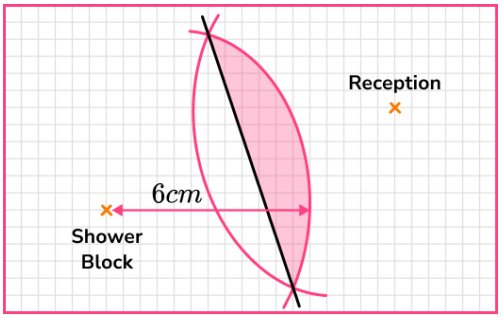
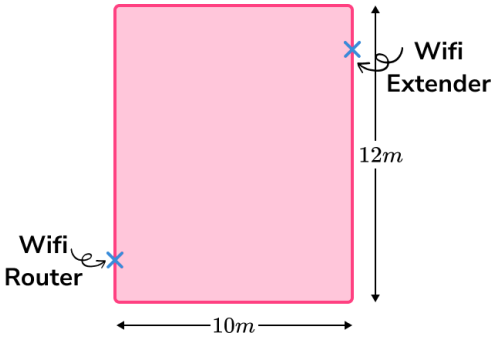
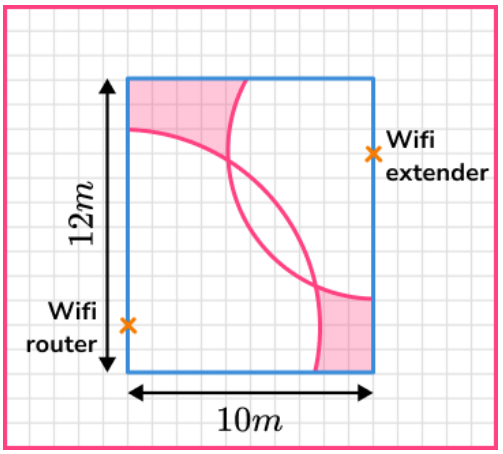
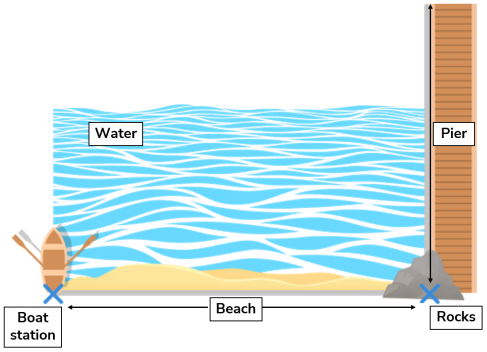
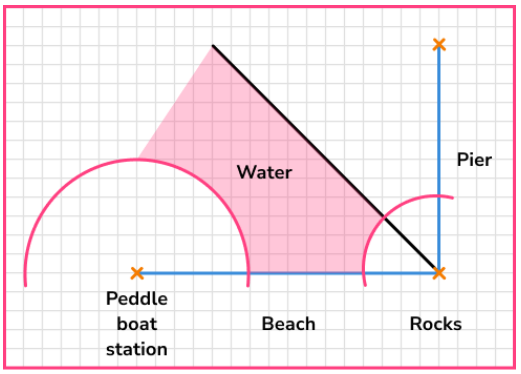
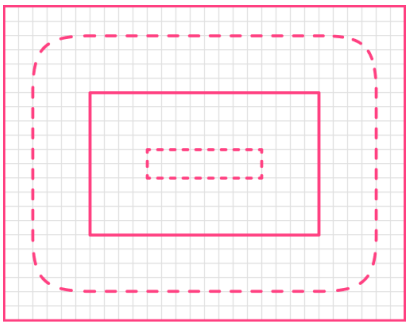
Loci - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	A campsite needs to install a new water tap. It must be closer to reception than the shower block, but within 30 metres of the shower block. Using a scale of 1 *cm* to 5 metres. Indicate the region where the water tap can be installed. 	Perpendicular bisector drawn Circle radius 6 *cm* drawn with shower block as the centre Correct region indicated/shaded 	**(1)** **(1)** **(1)**
2)	 The diagram shows positions of a wifi router and wifi extender in a floor plan of a single storey house. The wifi router has a range of 8 metres and the wifi extender has a range of 6 metres. Show on the diagram the regions where the wifi router and wifi extender do not reach. Use a scale of 1 *cm* to 2 metres.	Circle radius 4 *cm* around wifi router Circle radius 3 *cm* around wifi extender Correct regions indicated/shaded 	**(1)** **(1)** **(1)**

Loci - Mark Scheme

3)	The diagram shows the plan of a beach and pier. The town's council wants to section off some areas of the beach and water for activities and safety. They plan to use floating ropes to mark the areas that are safe for swimming and the areas that are for peddle boats only. Swimmers must stay 20 metres away from the rocks and be closer to the beach than the pier. They must also stay 30 metres away from the peddle boat station. Show on the diagram, using a scale of 1cm to 10 metres, the region that is safe for swimmers. 	Circle radius 2 *cm* around rocks Circle radius 3 *cm* around peddle boat station Correct angle bisector drawn between beach and pier Correct regions indicated/shaded 	**(1)** **(1)** **(1)** **(1)**
4)	The diagram shows a rectangle. On the diagram draw the locus of the points that are 2 *cm* from the perimeter of the rectangle. 	Arcs radius 2 *cm* around corners of the rectangle Lines parallel and 2 *cm* away from perimeter outside the rectangle Lines parallel and 2 *cm* away from perimeter inside the rectangle 	**(1)** **(1)** **(1)**

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