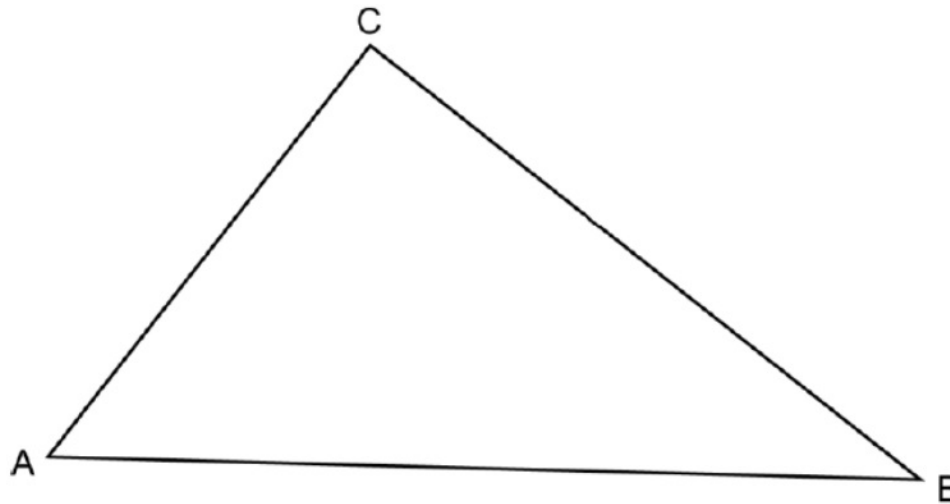


G14...Loci and Regions

OCR

17 (a) Triangle ABC is shown below.

Created by W Neill



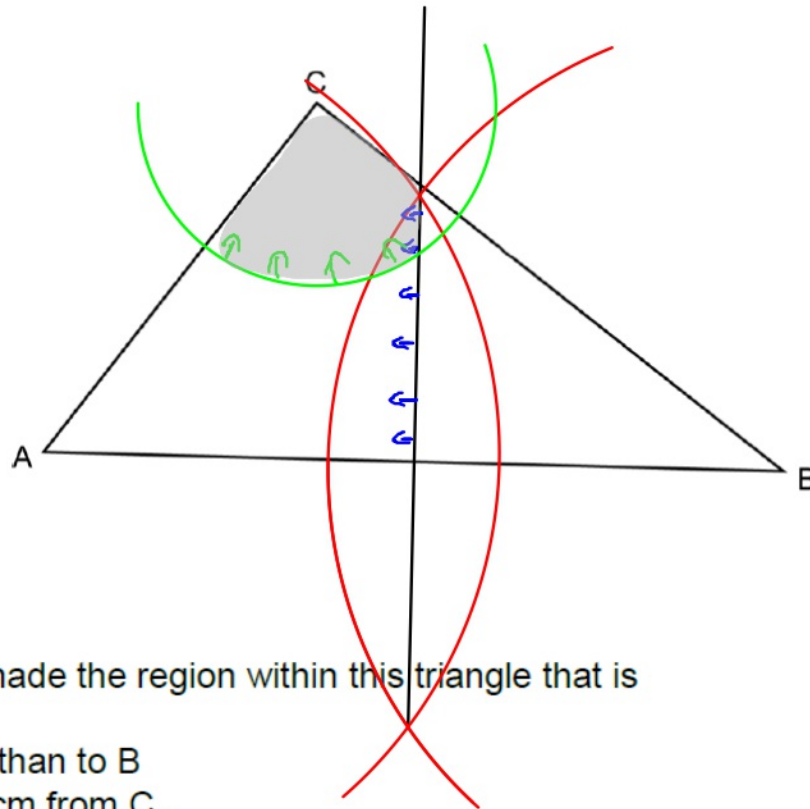
Construct and shade the region within this triangle that is

- nearer to A than to B
- less than 3 cm from C.

Show all your construction lines.

**[5]**

17 (a) Triangle ABC is shown below.



Construct and shade the region within this triangle that is

- nearer to A than to B
- less than 3 cm from C.

Show all your construction lines.

[5]

16 The scale diagram shows the positions of town A and town B.

Video created by W Neill

Scale: 1 cm represents 10 miles

B •

A •

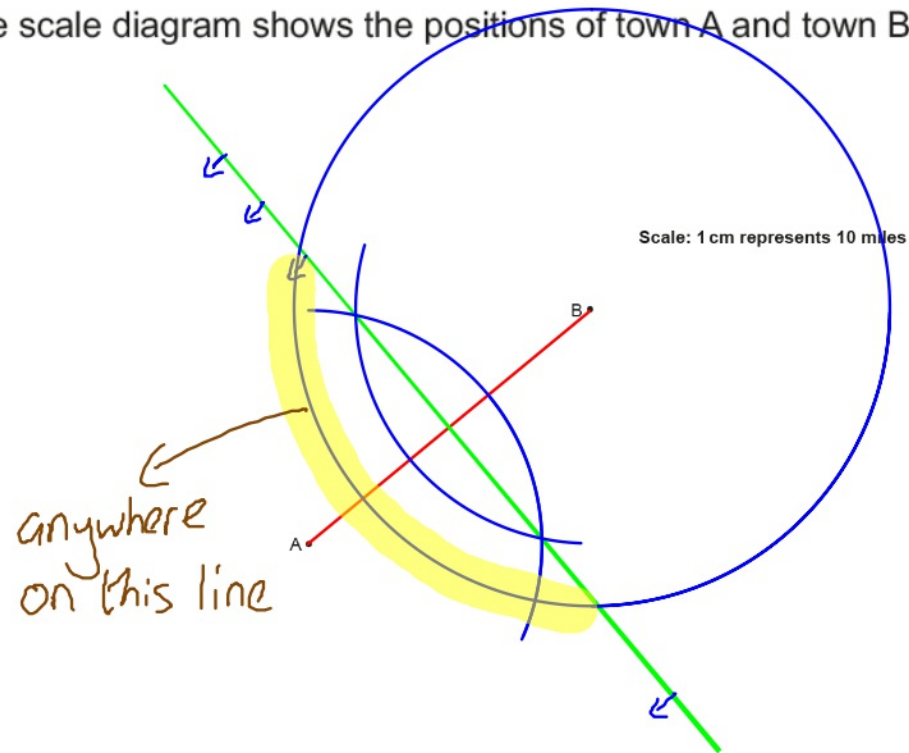
Lucy's house is nearer to town A than to town B.  
Her house is exactly 50 miles from town B.

On the scale diagram show all the possible positions of Lucy's house.  
You must show all your construction lines.

[5]

16 The scale diagram shows the positions of town A and town B.

Video created by W Neill



$$1\text{cm} = 10\text{miles}$$
$$5\text{cm} = 50\text{miles}$$

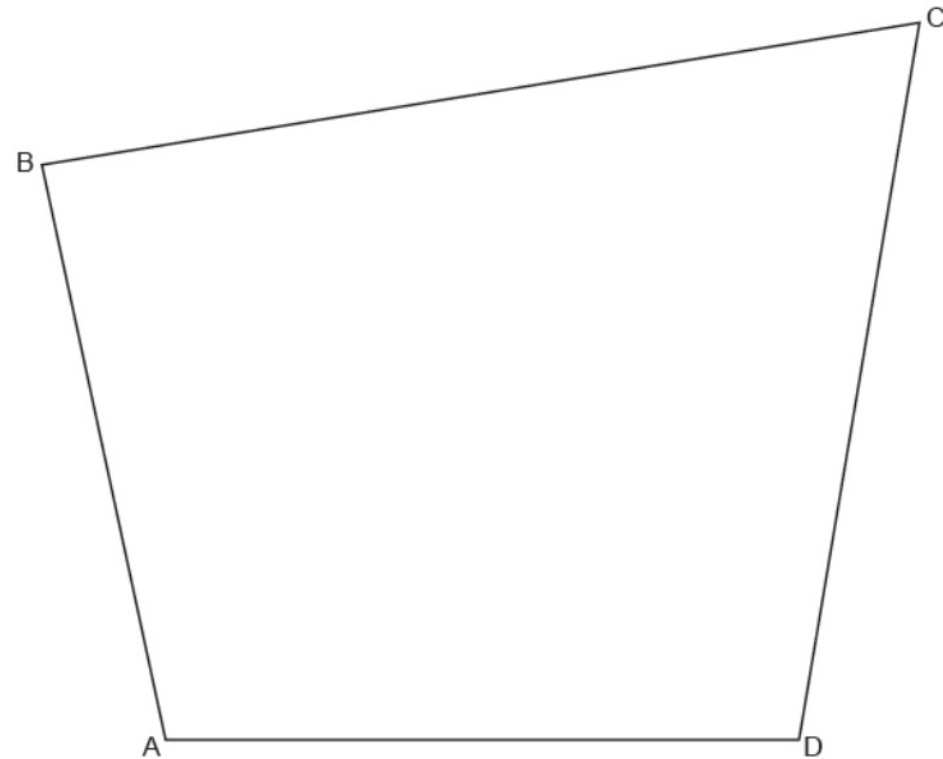
Lucy's house is nearer to town A than to town B.  
Her house is exactly 50 miles from town B.

On the scale diagram show all the possible positions of Lucy's house.  
You must show all your construction lines.

[5]

(b) The scale drawing represents a park.

Scale: 1 cm represents 25 m



A new play area must be

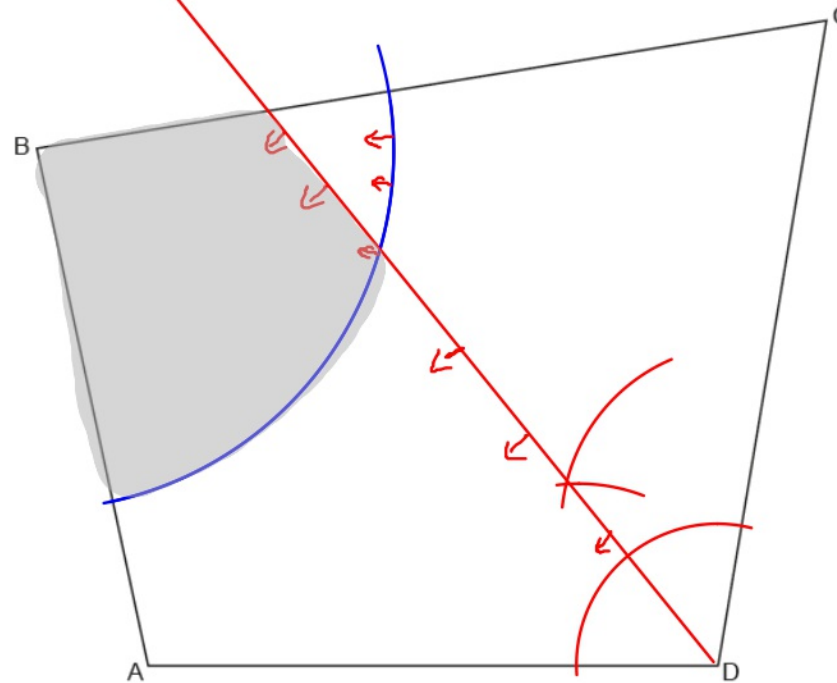
- no more than 150 m from B
- closer to AD than to CD.

Construct and shade the region where the play area can be positioned.  
Show all your construction lines.

(b) The scale drawing represents a park.

Scale: 1 cm represents 25 m

$$\begin{aligned} 1\text{cm} &= 25\text{m} \\ 6\text{cm} &= 150\text{m} \end{aligned}$$



A new play area must be

- no more than 150 m from B ✓
- closer to AD than to CD.

Construct and shade the region where the play area can be positioned.  
Show all your construction lines.



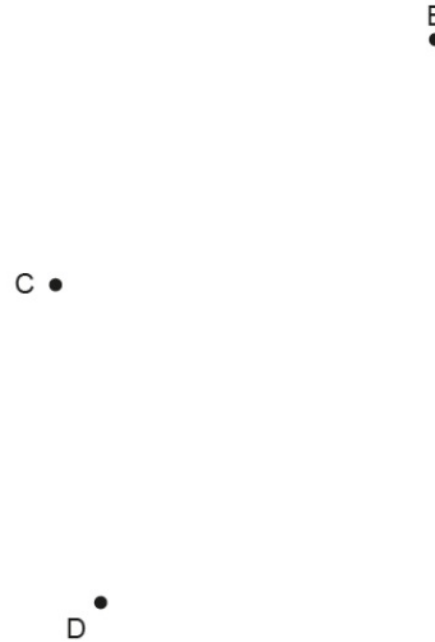
Created by W Neill

20 Four points A, B, C and D are shown on the scale diagram below.

(a) On the diagram, construct and mark the two points that are

- the same distance from A and B
- and
- 15m from C.

Show all your construction lines.



Scale: 1 cm represents 5 m

(b) The points A, B, C and D represent the four corners of Monty's garden. His garden is bounded by four straight fences A to B, B to C, C to D and D to A.

Monty wants to plant a tree in his garden at a place that satisfies the two conditions in part (a).

Explain why there is only one position where Monty can plant his tree.

.....

..... [1]

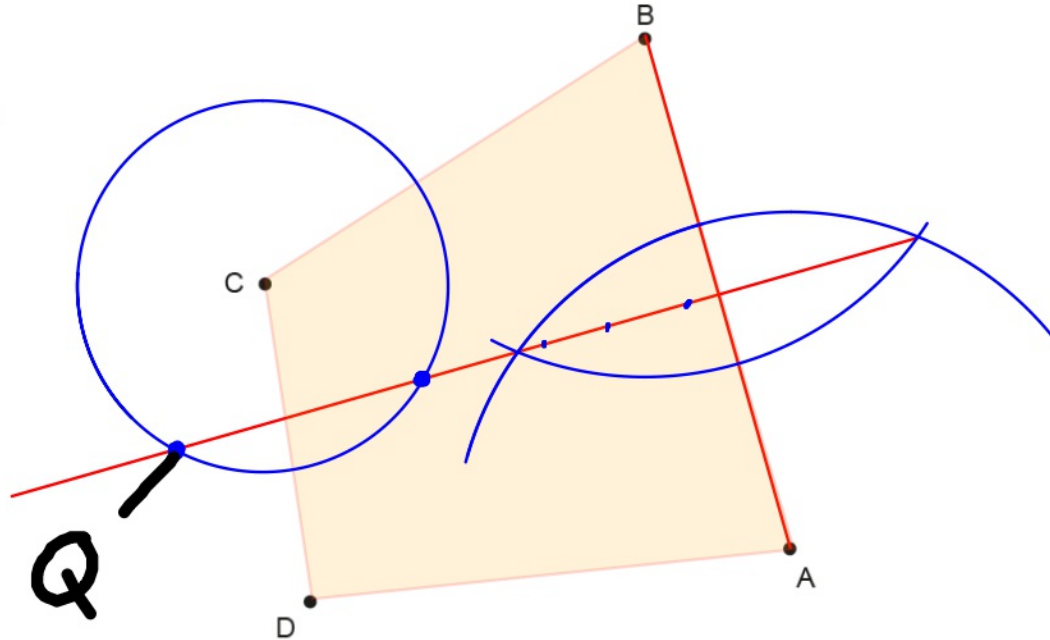
20 Four points A, B, C and D are shown on the scale diagram below.

Created by W Neill

(a) On the diagram, construct and mark the two points that are

- the same distance from A and B and
- 15m from C.

Show all your construction lines.



(b) The points A, B, C and D represent the four corners of Monty's garden. His garden is bounded by four straight fences A to B, B to C, C to D and D to A.

Scale: 1 cm represents 5 m

Monty wants to plant a tree in his garden at a place that satisfies the two conditions in part (a).

$$3\text{cm} \hat{=} 15\text{m}$$

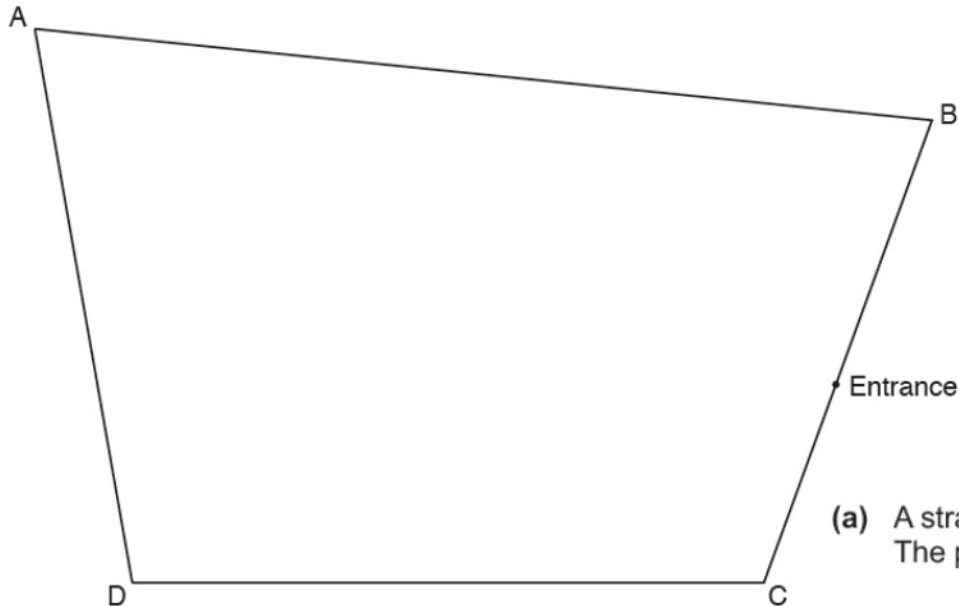
Explain why there is only one position where Monty can plant his tree.

Point Q is outside the walls so not inside the garden.

[1]

18 The diagram shows a scale drawing of a park, ABCD.

Created by W Neill



Scale: 1 cm represents 10m

- (a) A straight water pipe runs across the park. The pipe runs equidistant from DA and DC. [2]

Construct, using compasses and ruler only, the position of the water pipe. You must show all your construction lines.

- (b) A straight path connects the entrance to the exit. This path is perpendicular to CB. [2]

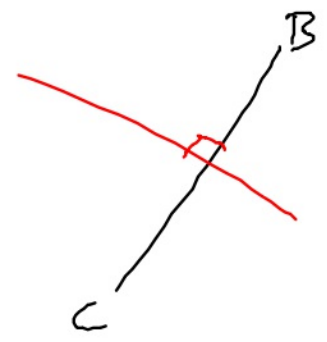
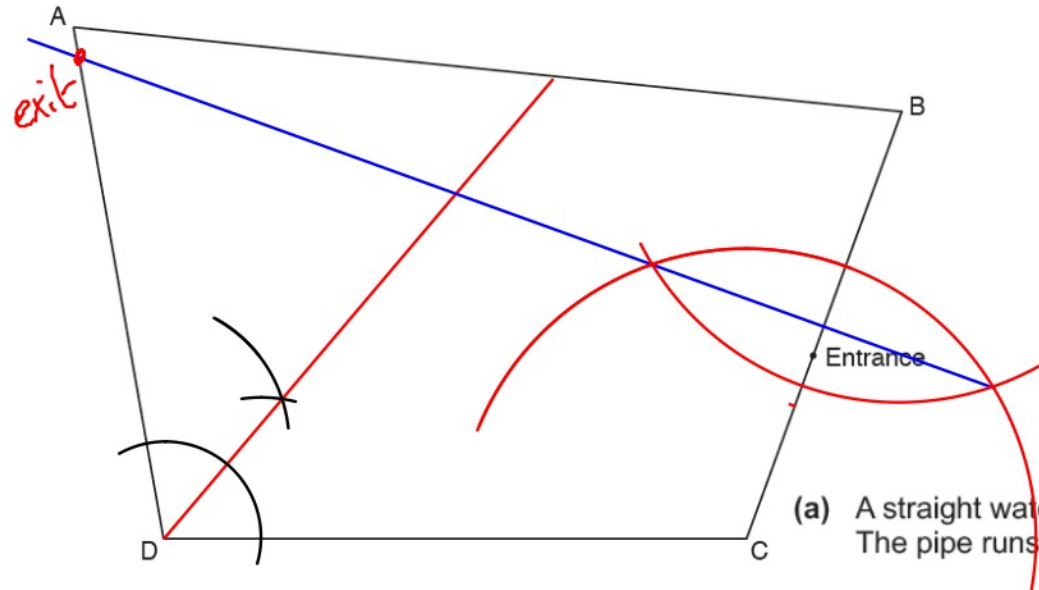
(i) Construct, using compasses and ruler only, the position of the path. Leave in all your construction lines.

(ii) Find the actual length of the path, in metres.

(b)(ii) ..... m [2]

18 The diagram shows a scale drawing of a park, ABCD.

Created by W Neill



- (a) A straight water pipe runs across the park. The pipe runs equidistant from DA and DC. ✓ [2]

Construct, using compasses and ruler only, the position of the water pipe. You must show all your construction lines.

Scale: 1 cm represents 10m

$1\text{ cm} = 10\text{ m}$   
 $\times 13.2 \rightarrow 13.2\text{ cm} = 132\text{ m}$   
 $\times 13.2$

- (b) A straight path connects the entrance to the exit. This path is perpendicular to CB. [2]

- (i) Construct, using compasses and ruler only, the position of the path. Leave in all your construction lines.  
 (ii) Find the actual length of the path, in metres.

(b)(ii)  $118\text{ m} \rightarrow 122\text{ m}$  ..... m [2]

20 The scale diagram below shows towns, A, B and C.  
Line AB represents the road from A to B and line AC represents the road from A to C.

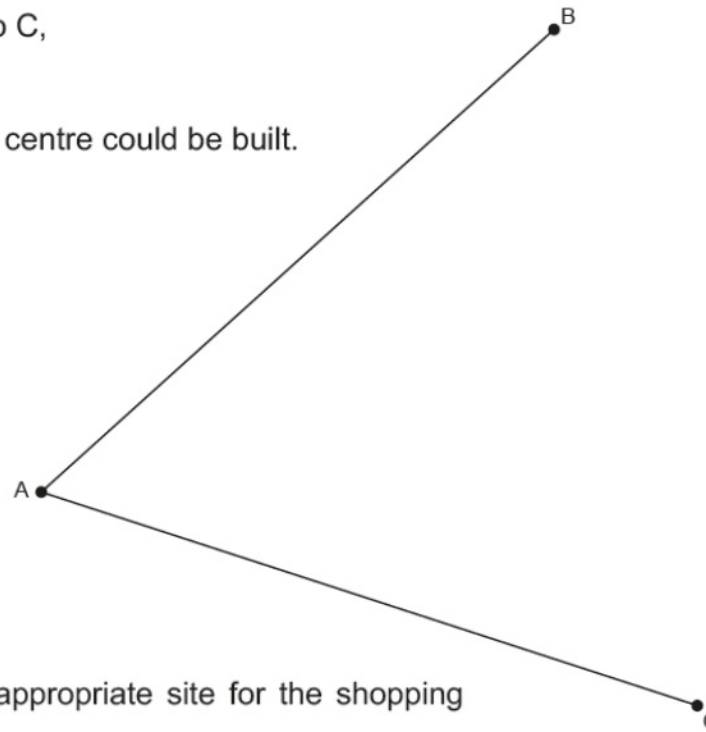
Created by W Neill

A shopping centre is to be built so that it is

- nearer to the road from A to B than the road from A to C,
- less than 14km from town C.

(a) Using construction, shade the region where the shopping centre could be built.  
Show all your construction lines.

Scale: 1 cm represents 2 km



(b) Explain why the region found in part (a) may not be an appropriate site for the shopping centre.

.....  
..... [1]

- 20 The scale diagram below shows towns, A, B and C.  
Line AB represents the road from A to B and line AC represents the road from A to C.

Created by W Neill

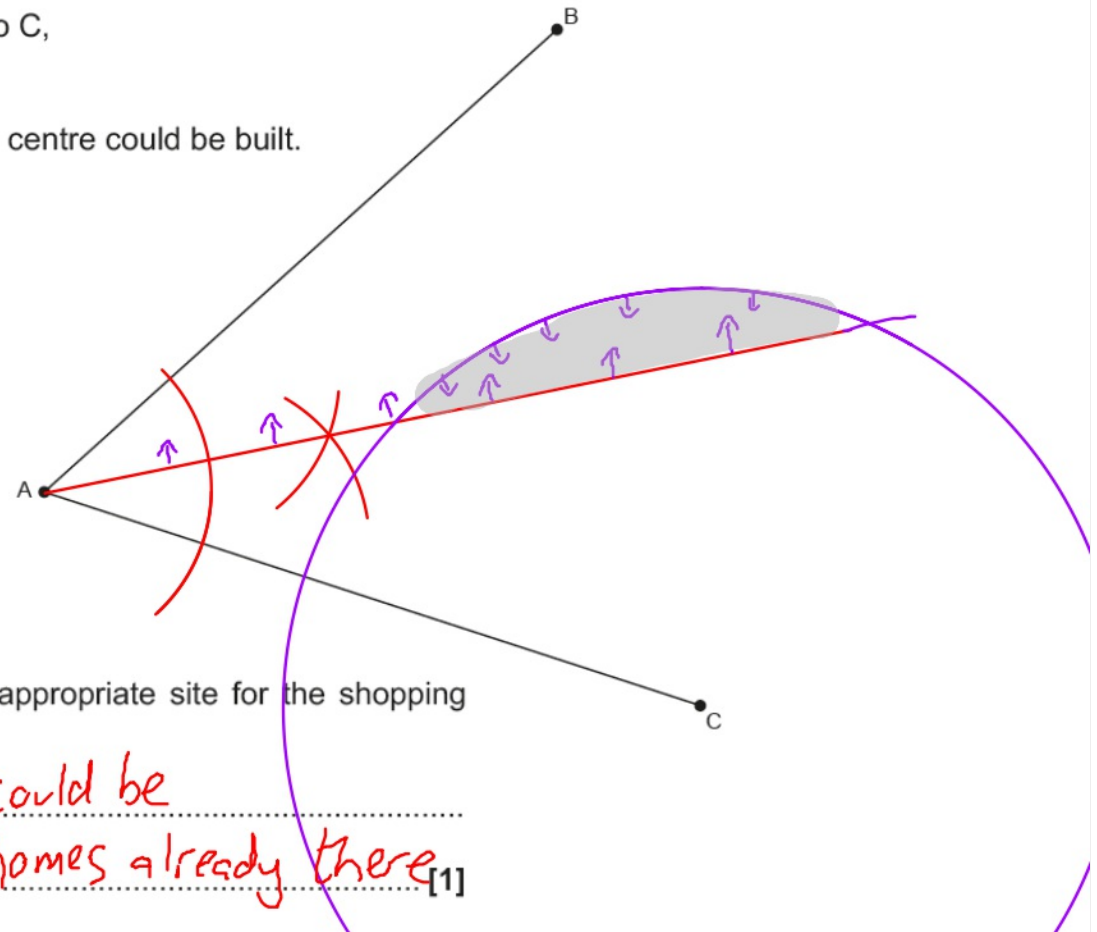
A shopping centre is to be built so that it is

- nearer to the road from A to B than the road from A to C,
- less than 14 km from town C.

- (a) Using construction, shade the region where the shopping centre could be built.  
Show all your construction lines.

Scale: 1 cm represents 2 km

7cm      14km

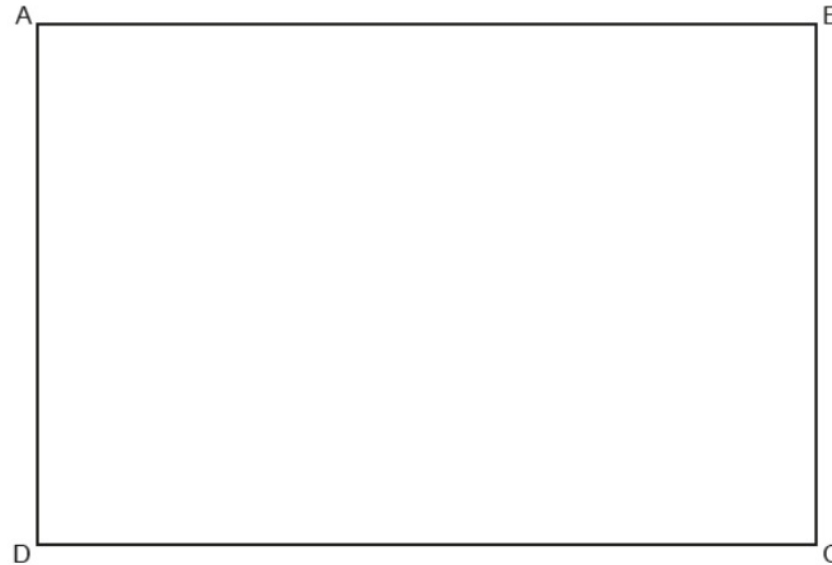


- (b) Explain why the region found in part (a) may not be an appropriate site for the shopping centre.

Maybe land isn't suitable / could be  
homes already there [1]

19 The scale drawing shows Katy's garden ABCD.

G14



Katy places a statue in the garden.

The statue is

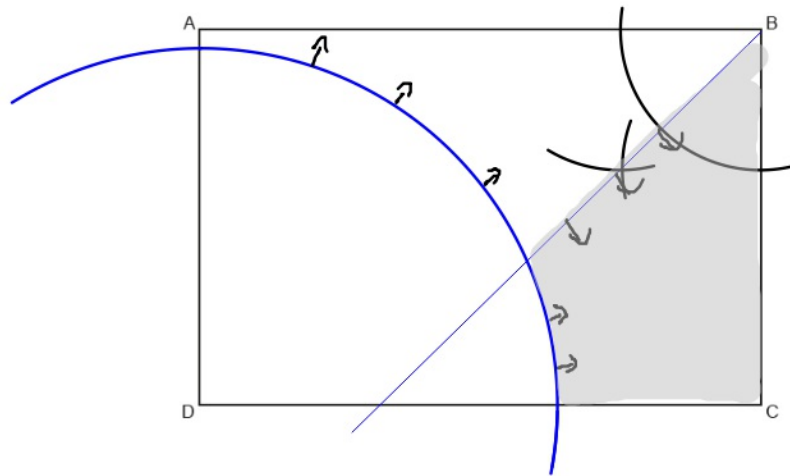
- more than 30m from D
- closer to CB than AB.

Construct and shade the region where the statue could be placed.  
Show all your construction lines.

[5]

19 The scale drawing shows Katy's garden ABCD.

G14



6cm      30m  $\uparrow$  x 6  
Scale: 1 cm represents 5 m

Katy places a statue in the garden.

The statue is

- more than 30m from D
- closer to CB than AB.

Construct and shade the region where the statue could be placed.  
Show all your construction lines.

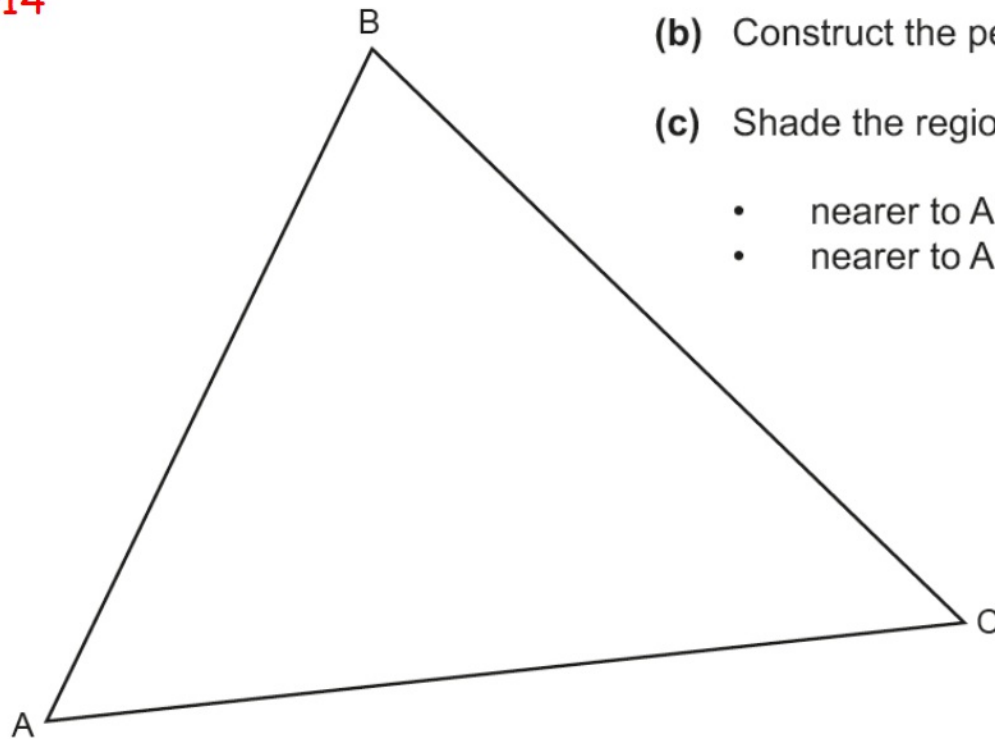
[5]



7 The diagram shows triangle ABC.

G13

G14



(a) Construct the bisector of angle BAC. [2]

(b) Construct the perpendicular bisector of AC. [2]

(c) Shade the region inside triangle ABC that is

- nearer to AC than to AB
- nearer to A than to C.

[1]

7 The diagram shows triangle ABC.

G13

G14

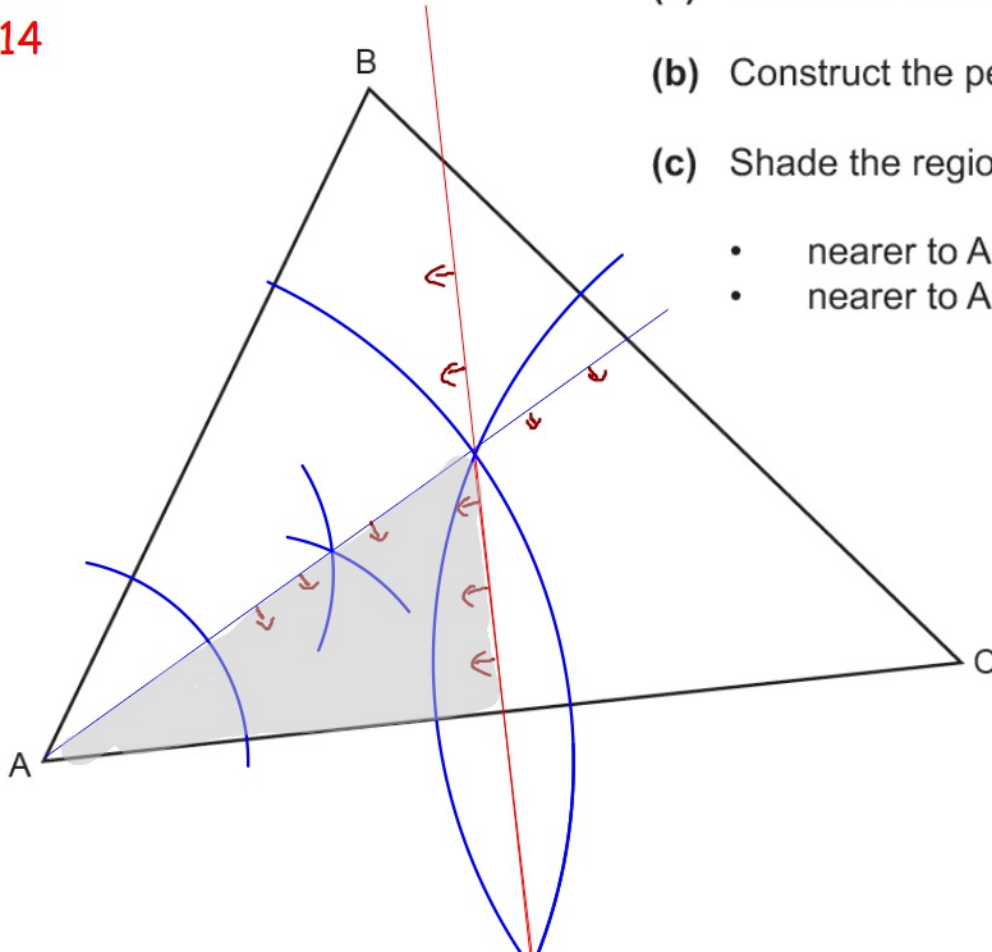
(a) Construct the bisector of angle BAC. [2]

(b) Construct the perpendicular bisector of AC. [2]

(c) Shade the region inside triangle ABC that is

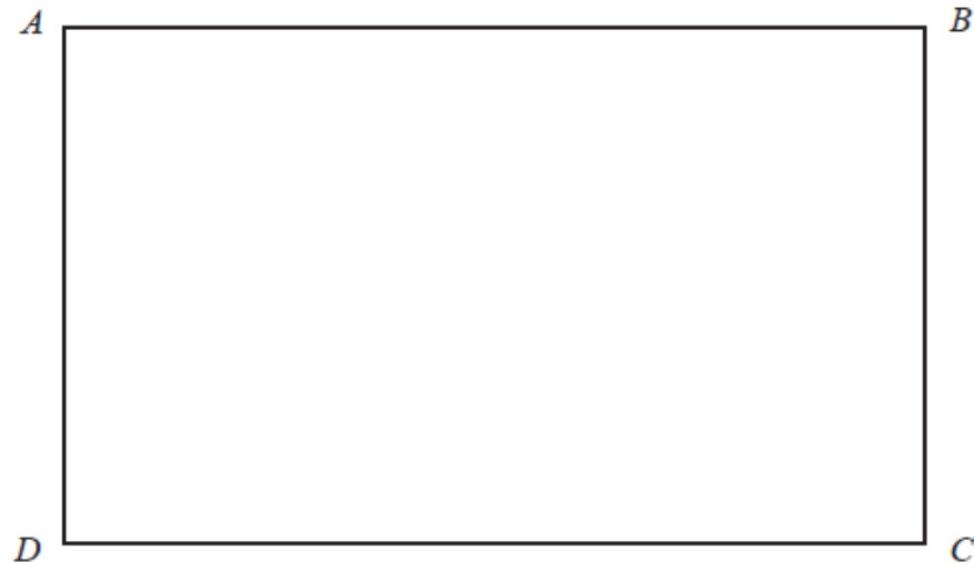
- nearer to AC than to AB
- nearer to A than to C.

[1]



Edexcel

3 Here is an accurate scale drawing of a school playground.



1 cm represents 2 m

Nasim is going to put a seat in the playground.

The seat has to be

- less than 9 m from *C*
- closer to *BC* than to *AB*
- more than 4 m from *AB*

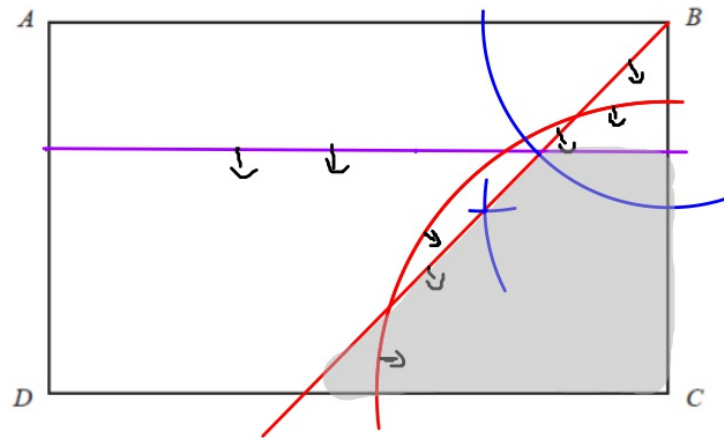
Show, by shading on the diagram, the region where Nasim can put the seat.

---

(Total for Question 3 is 4 marks)

Created by W Neill

3 Here is an accurate scale drawing of a school playground.



$$1 \text{ cm} = 2 \text{ m}$$
$$4.5 \text{ cm} = 9 \text{ m}$$
$$2 \text{ cm} = 4 \text{ m}$$

1 cm represents 2 m

Nasim is going to put a seat in the playground.

The seat has to be

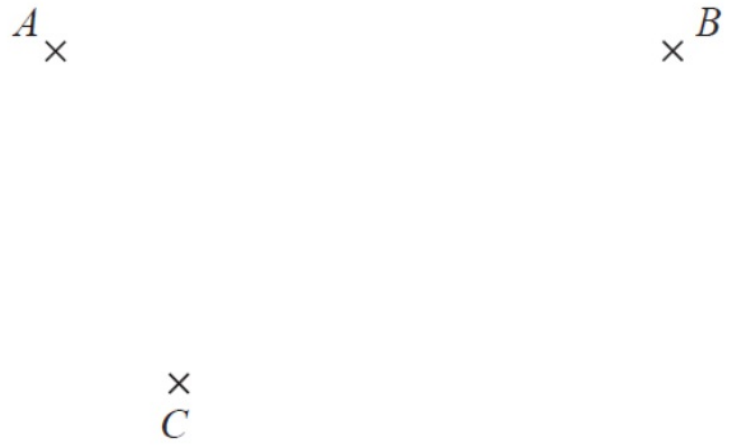
- less than 9 m from  $C$
- closer to  $BC$  than to  $AB$
- more than 4 m from  $AB$

Show, by shading on the diagram, the region where Nasim can put the seat.

(Total for Question is 4 marks)

25 This accurate diagram shows three points  $A$ ,  $B$  and  $C$ .

G14



Region **R** contains all the points that are

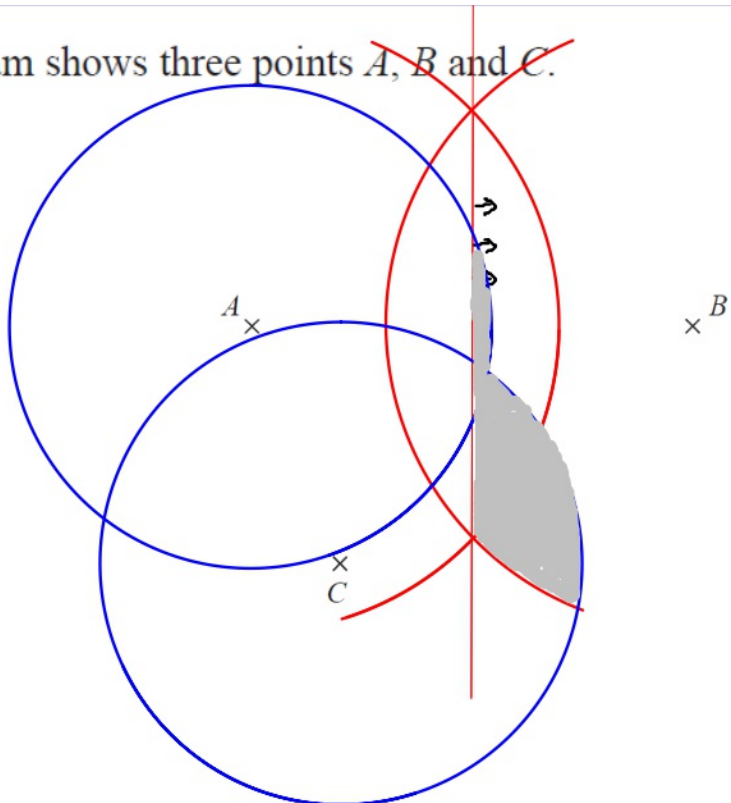
less than 4 cm from each of the points  $A$  and  $C$   
and nearer to point  $B$  than to point  $A$

Show, by shading, the region **R**.

**(Total for Question 25 is 3 marks)**

25 This accurate diagram shows three points  $A$ ,  $B$  and  $C$ .

G14



Region **R** contains all the points that are

less than 4 cm from each of the points  $A$  and  $C$   
and nearer to point  $B$  than to point  $A$  ✓

Show, by shading, the region **R**.

(Total for Question is 3 marks)

16  $A$ ,  $B$  and  $C$  are three points on a map.

Video created by W Neill

$A \times$

$B$   
 $\times$

$\times$   
 $C$

1 cm represents 100 metres.

Point  $T$  is 250 metres from point  $A$ .

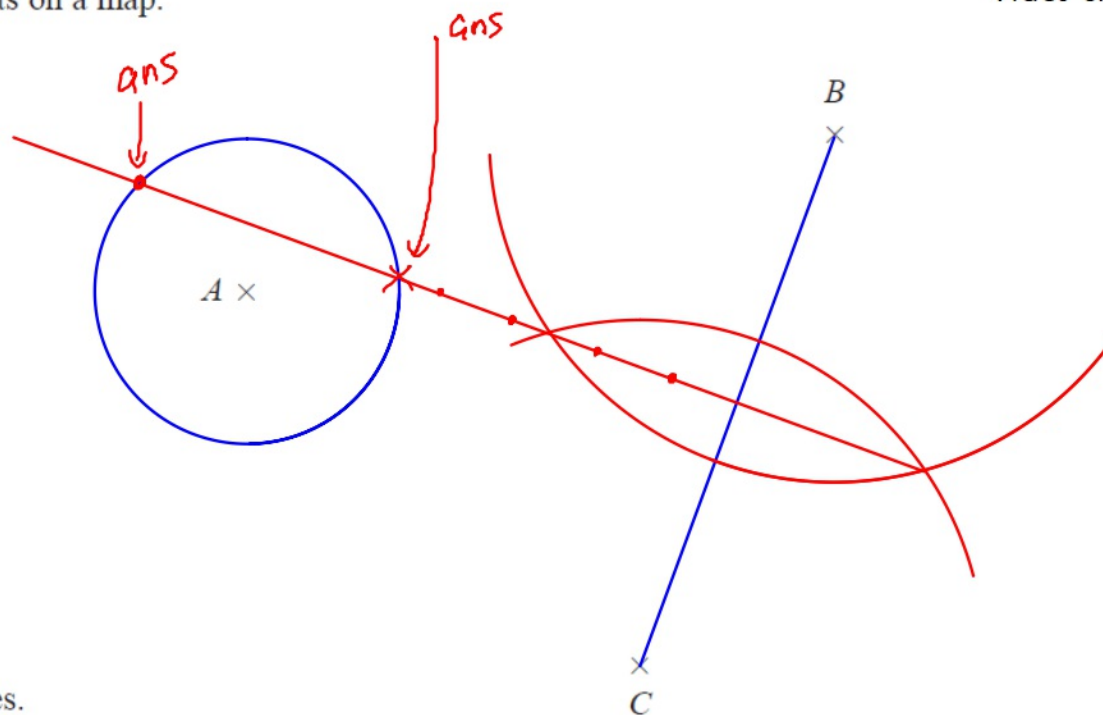
Point  $T$  is equidistant from point  $B$  and point  $C$ .

On the map, show one of the possible positions for point  $T$ .



16  $A$ ,  $B$  and  $C$  are three points on a map.

Video created by W Neill



$$250\text{m} = 2.5\text{cm}$$

1 cm represents 100 metres.

Point  $T$  is 250 metres from point  $A$ . ✓

Point  $T$  is equidistant from point  $B$  and point  $C$ .

On the map, show one of the possible positions for point  $T$ .

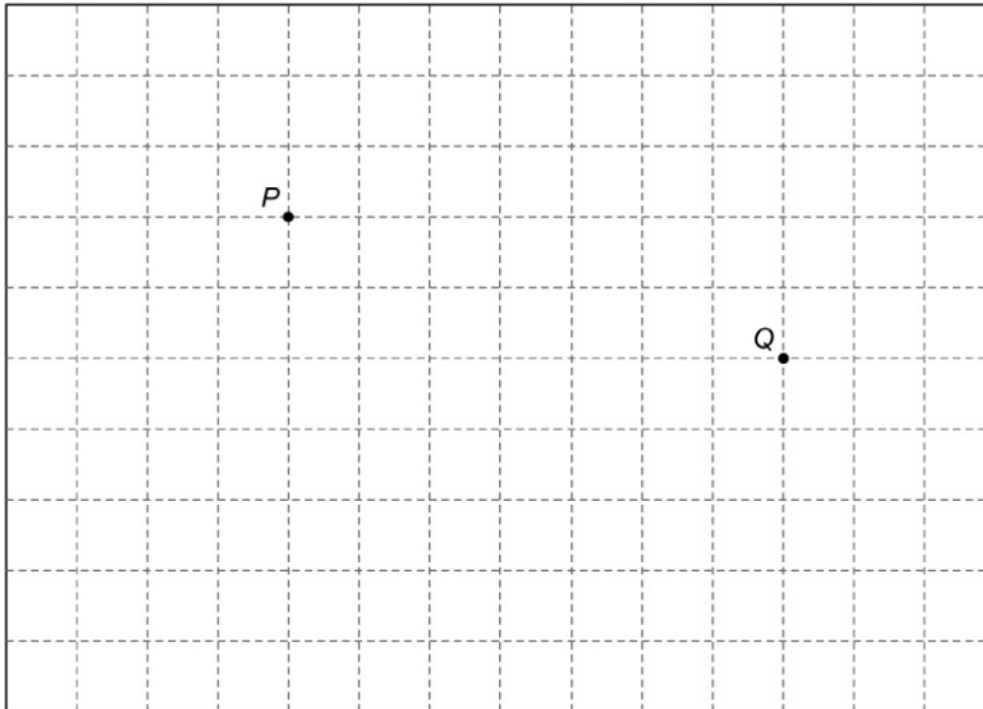
AQA

14 The scale drawing represents a garden.

G14

Water from a sprinkler at  $P$  reaches up to 20 metres from  $P$ .

Water from a sprinkler at  $Q$  reaches up to 25 metres from  $Q$ .



Scale: 1 cm represents 5 m

Using a pair of compasses,

show the region that water from **both** sprinklers reaches.

[2 marks]

14

The scale drawing represents a garden.

Video created by W Neill

G14

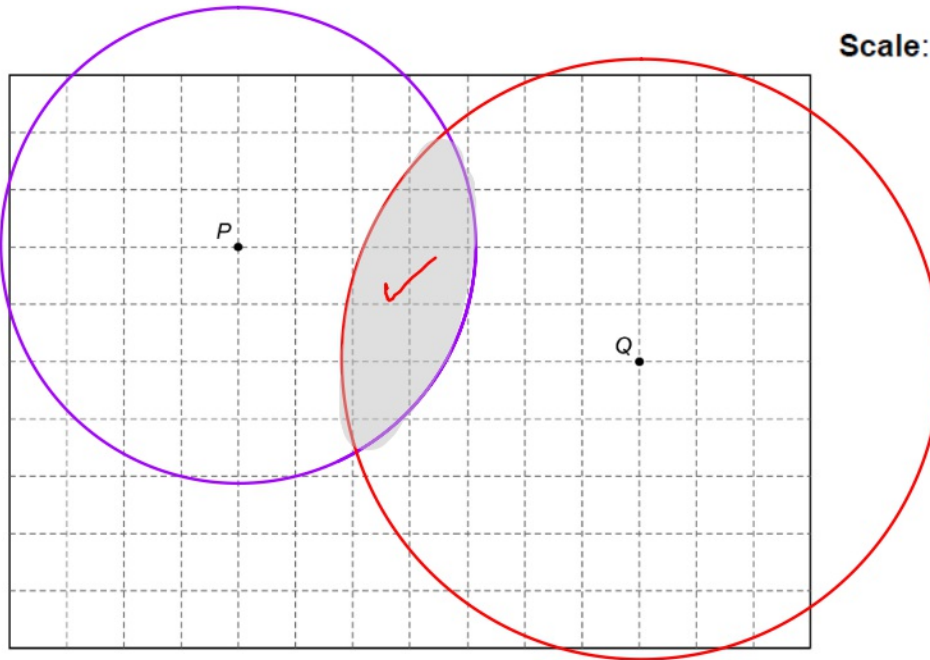
Water from a sprinkler at  $P$  reaches up to 20 metres from  $P$ .

Water from a sprinkler at  $Q$  reaches up to 25 metres from  $Q$ .

$$20\text{m} = 4\text{cm}$$

$$25\text{m} = 5\text{cm}$$

Scale: 1 cm represents 5 m



Using a pair of compasses,

show the region that water from **both** sprinklers reaches.

[2 marks]