

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Geometry

Using a pair of compasses & Constructing loci

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

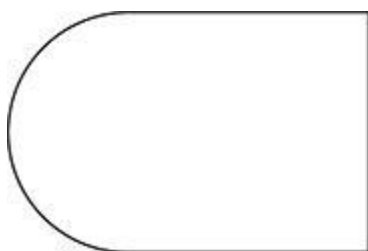
- In all calculations, show clearly how you work out your answer

For questions 1 and 2, you must **NOT** use a calculator.



Q1.

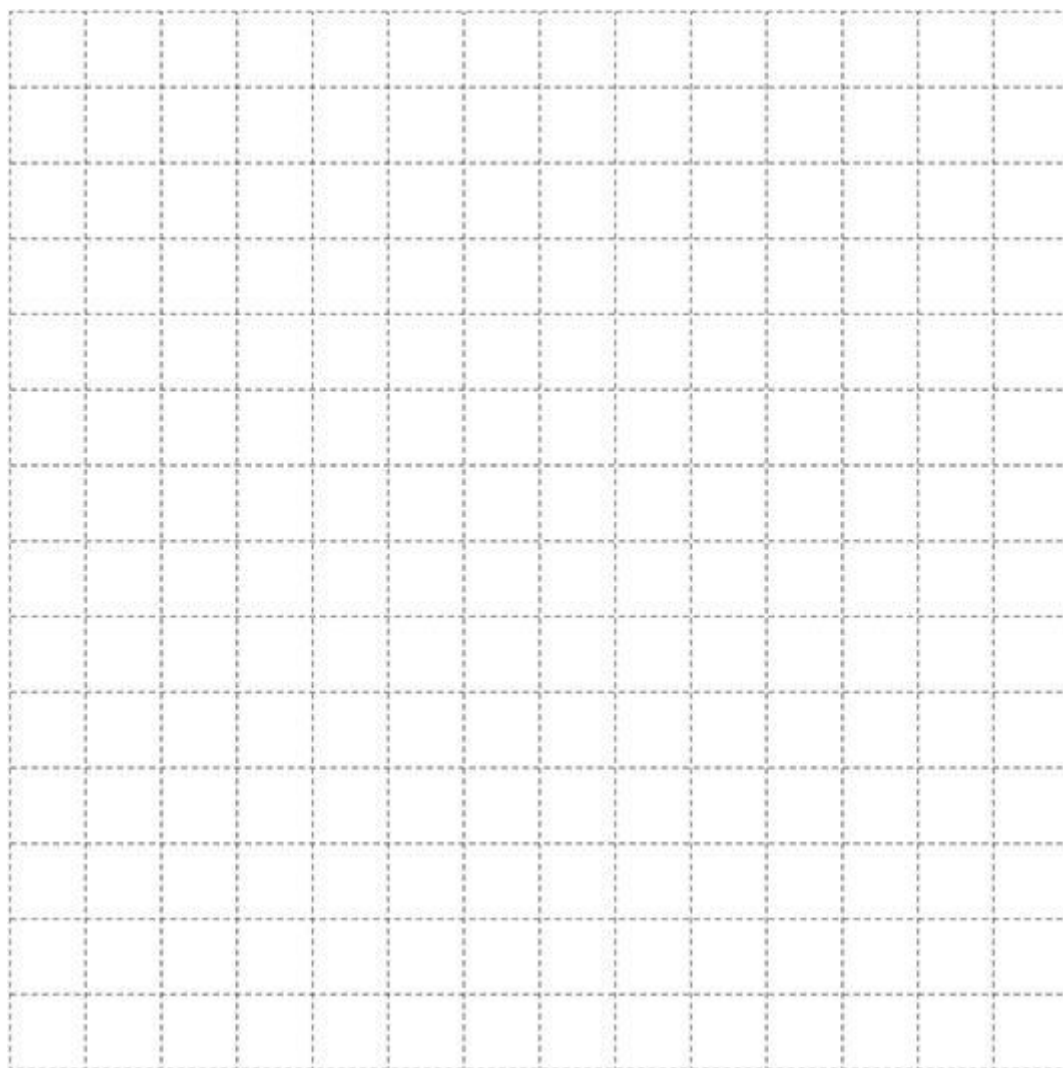
This shape is made from a semicircle and a square.



6 cm

Not drawn
accurately

On the centimetre grid below, make an accurate drawing of the shape.



(Total 2 marks)

Q2.

Construct the region that lies within 4 cm of the line.



(Total 3 marks)

For questions 3 to 5, you may use a calculator.

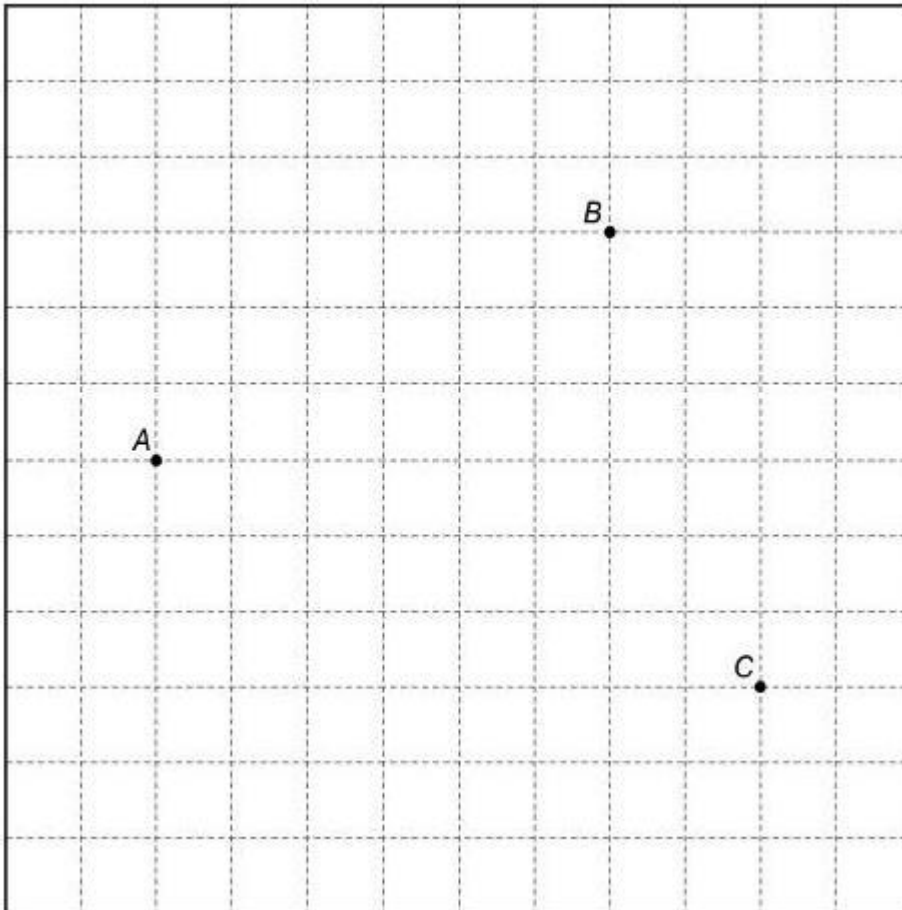


Q3.

Using ruler and compasses, show the region inside the grid that is
less than 4 cm from A
and
nearer to B than to C .

Label the region R .

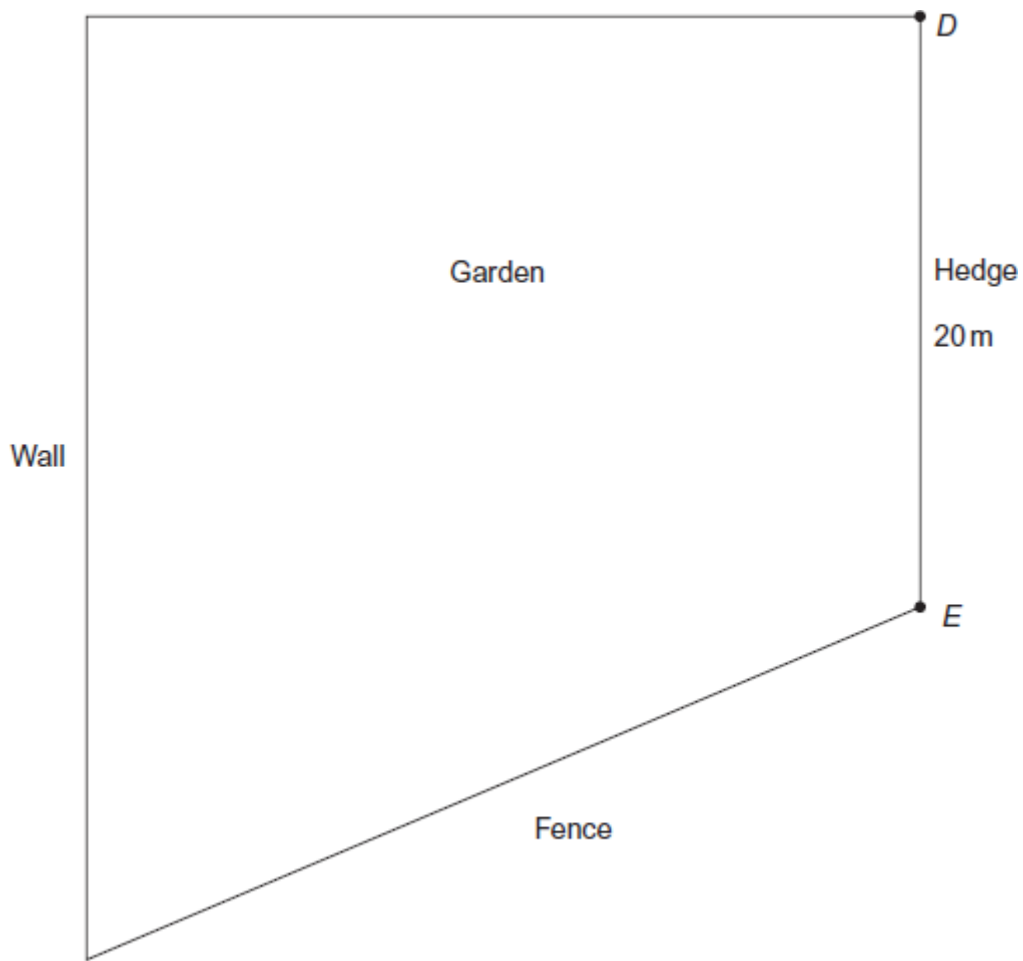
Show all your construction lines.



(Total 3 marks)

Q4.

You will need a ruler and a pair of compasses to answer this question.
The diagram shows a plan of a garden.
The hedge DE is 20 metres long.



A tree is to be planted so that it is
20 metres from D
and the same distance from the wall as from the fence.
Construct the position of the tree on the plan.

(Total 3 marks)

Q5.

You will need a ruler and compasses for this question.

Draw accurately the locus of a point which is always 5 cm from the line.



(Total 3 marks)

Constructions and loci – Using a pair of compasses & Constructing loci – Cross topic questions

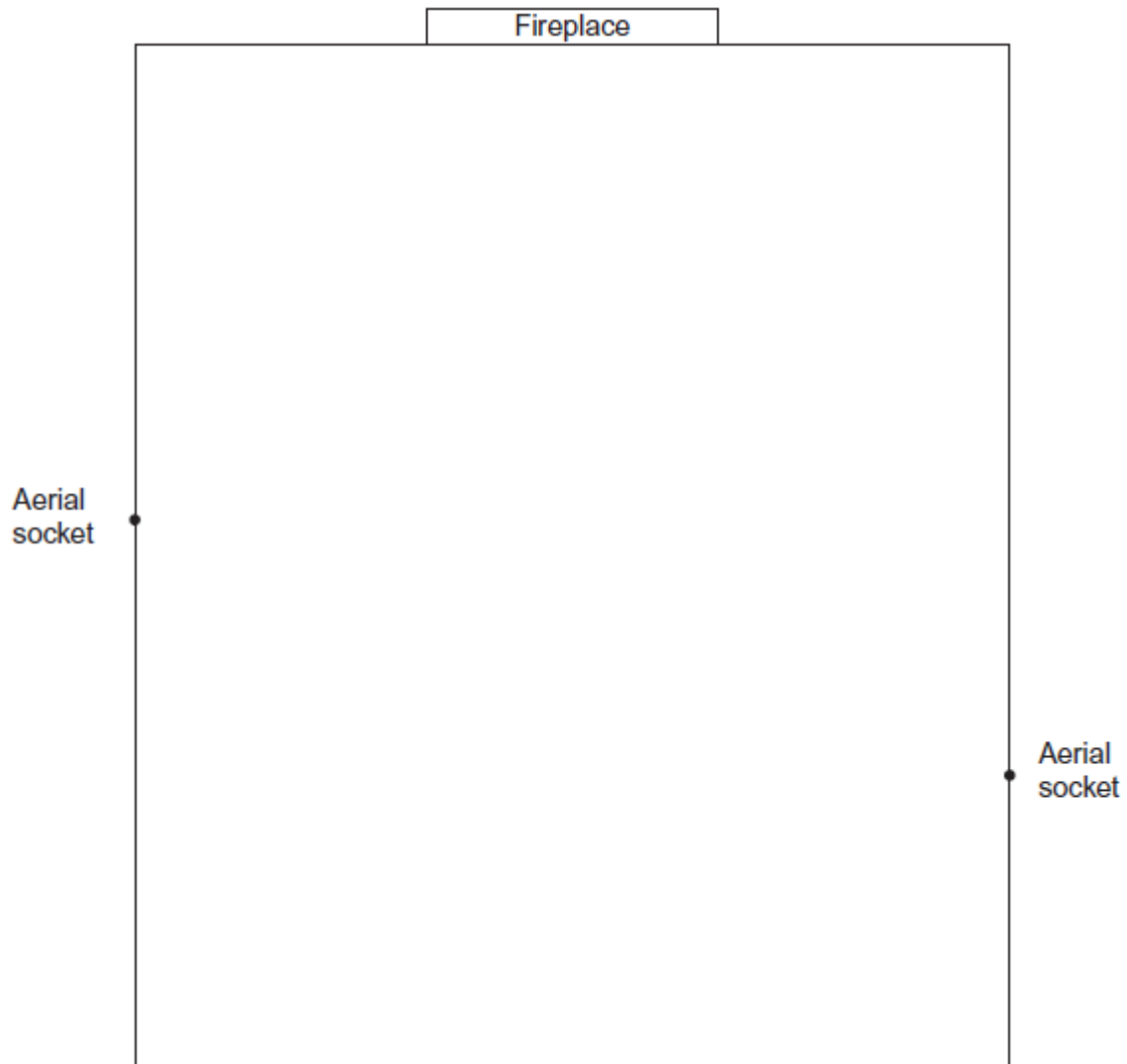
For question 6, you must **NOT** use a calculator.



Q6.

The diagram shows the plan of a room.

Scale: 4 cm represents 1 m



A new socket is to be fitted to one of the walls.

It must be

equidistant from the two aerial sockets

at least half a metre from the fireplace.

Use a ruler and compasses to show where the socket should be fitted.

Mark the position of the new socket with the letter S.

(Total 4 marks)

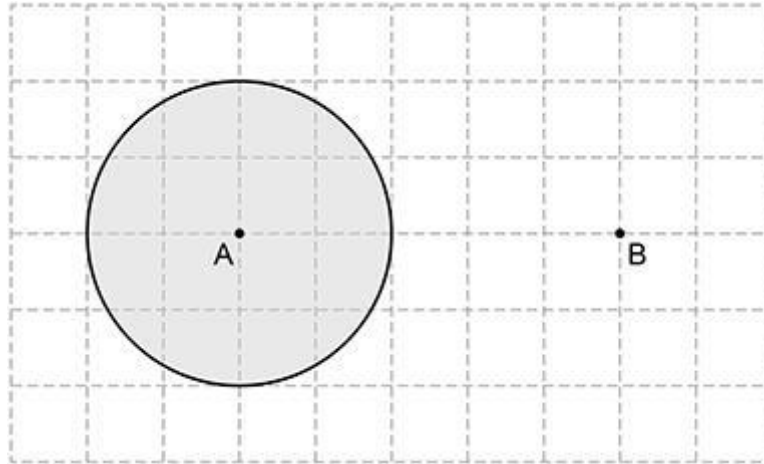
For the rest of the questions, you may use a calculator.



Q7.

Towns A and B are shown on a centimetre grid.

Scale: 1 cm represents 10 miles



What does the shaded area represent?

Tick **one** box.

☐
☐
☐
☐

All the points nearer to A than to B

All the points at least 30 miles from B

All the points halfway between A and B

All the points within 20 miles of A

(Total 1 mark)

Q8.

- (a) Draw a circle with **diameter** 12 cm, centre P .



- (b) On your circle draw a sector of angle 60°

(2)

(2)

(Total 4 marks)

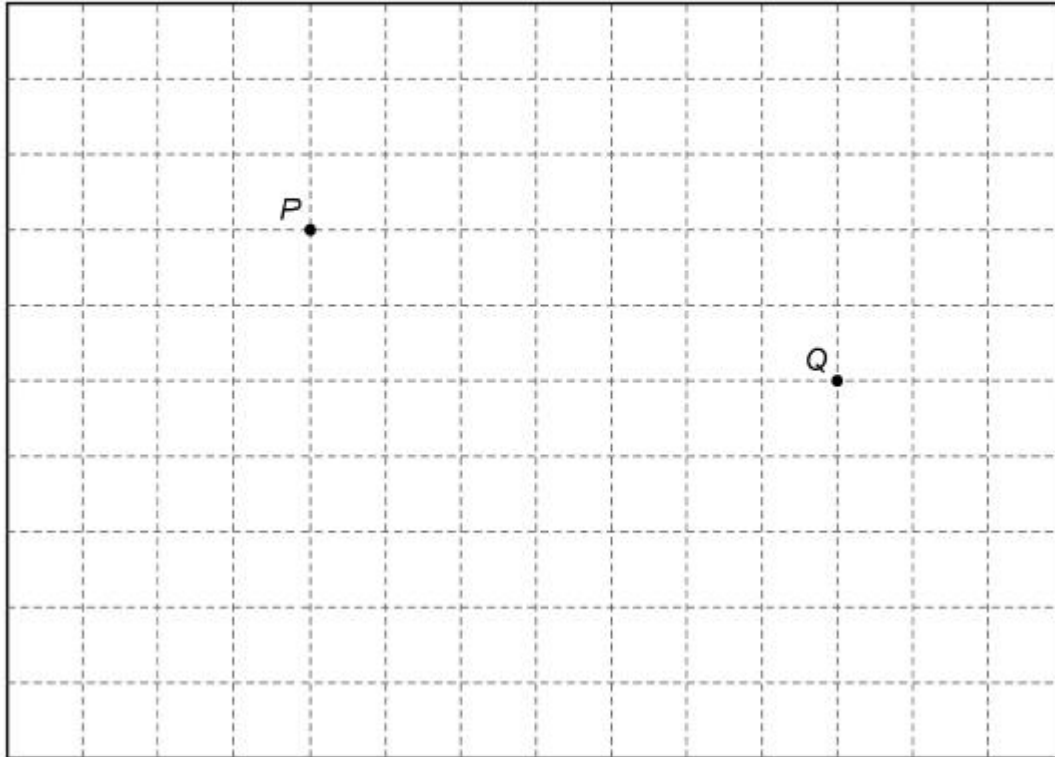
Q9.

The scale drawing represents a garden.

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.

(Total 2 marks)

Q10.

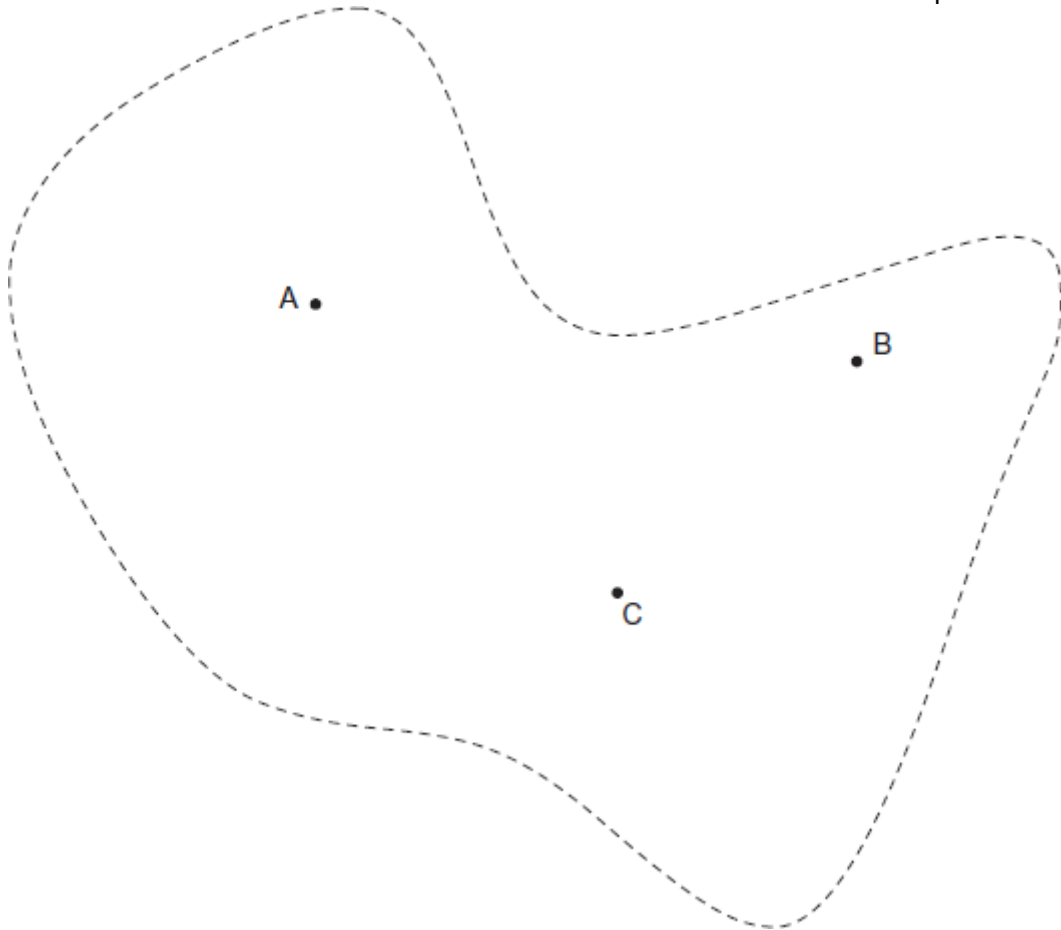
You need compasses to answer this question.

The scale drawing shows the positions of three mobile phone masts A, B and C.

The masts provide mobile phone coverage in a town.

The town border is shown by the dotted line on the diagram.

Scale 1 cm represents 1 km



Places in the town have mobile phone coverage if they are
less than 4.5 km from A

or

less than 3.5 km from B

or

less than 3 km from C.

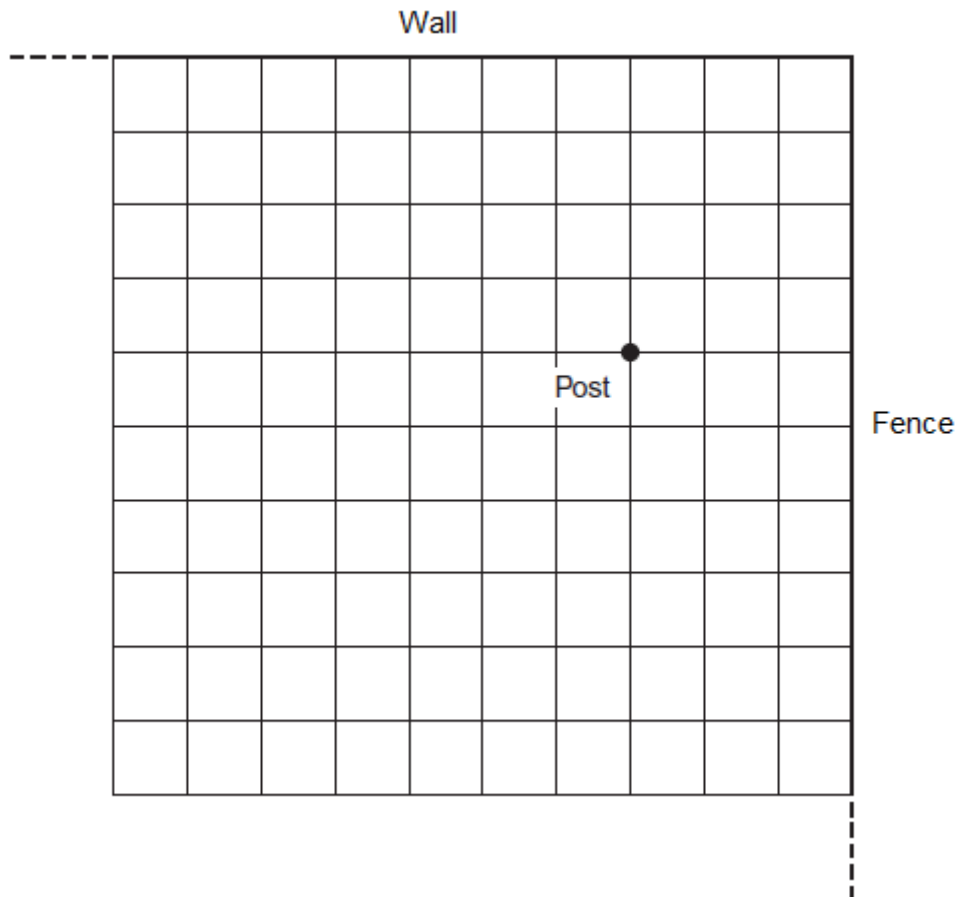
Shade the area in the town that does **not** have mobile phone coverage.

(Total 4 marks)

Q11.

The scale drawing shows a post which is 1.5 metres from the fence.

Drawn
to scale



- (a) How far is the post from the wall?

(1)

- (b) A pony is tied to the post by a rope.

The pony can reach 2.5 metres from the post.

On the scale drawing, show accurately the area that the pony can reach.

(2)

- (c) Work out the scale of the drawing as a ratio.

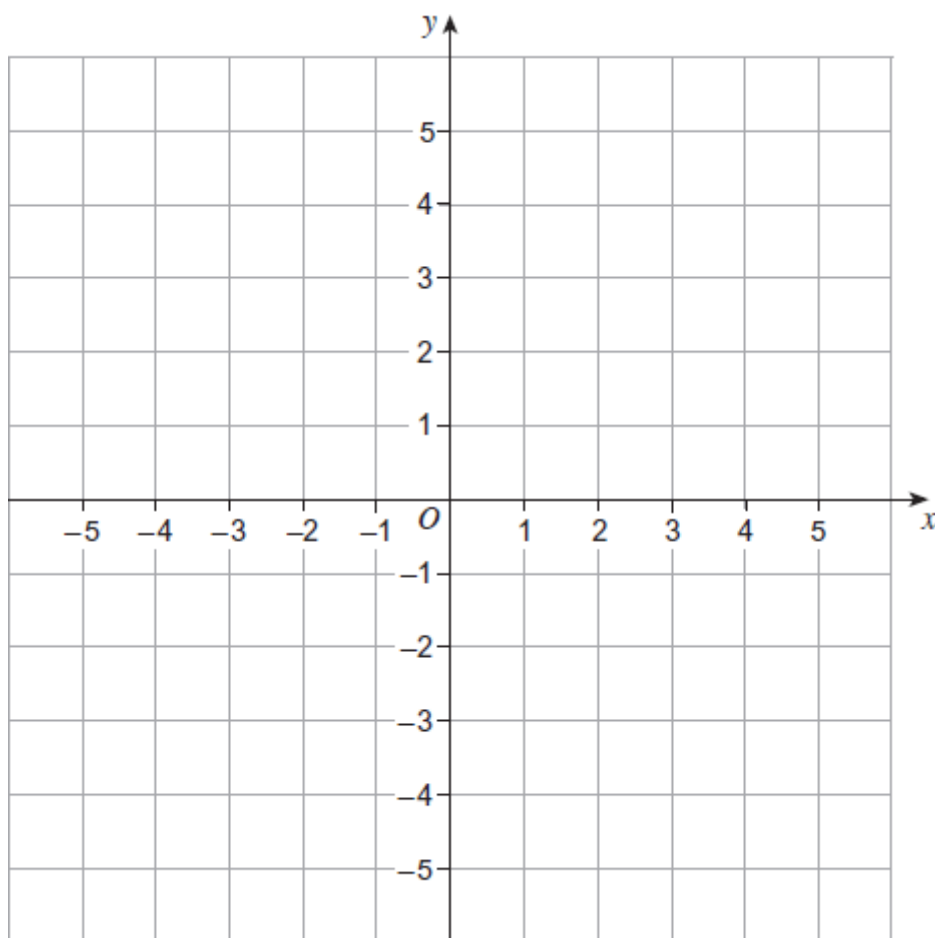
Give your answer in its simplest form.

(3)

(Total 6 marks)

Q12.(H)

- (a) Draw the locus of all points on the grid which are 4 units from $(0, 0)$



- (b) Write down the equation of this locus.

(1)

(1)

(Total 2 marks)