GCSE MATHEMATICS
Compass Practice

AQA These questions have been taken or modified from previous AQA GCSE Mathematics Papers.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information
- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in questions that are indicated with an asterisk (*).

Advice
- Read each question carefully before you start to answer it.
- In all calculations, show clearly how you work out your answer.
- Use the number of marks for the question as a guide to the amount of time you need to spend.
- Look at previous parts of the question, e.g. a), b), c) i) as there may be information there you need to answer later parts.
- Check your answer is realistic and appropriate.
- For calculator decimal numbers always write your full calculator display in the working out area and then, if you need to, round the answer on the answer line.

www.thecalculatorguide.com

1 (a) Using a compass, draw a circle with **diameter** 12 cm, centre *P*.
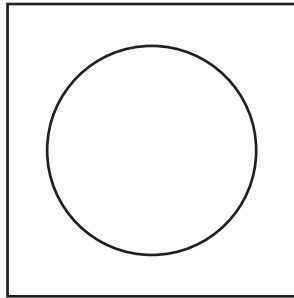
[2 marks]

• *P*

1 (b) On your circle draw a sector of angle 60º
You may use a protractor.

[2 marks]

2 You need a ruler and compasses to answer this question.

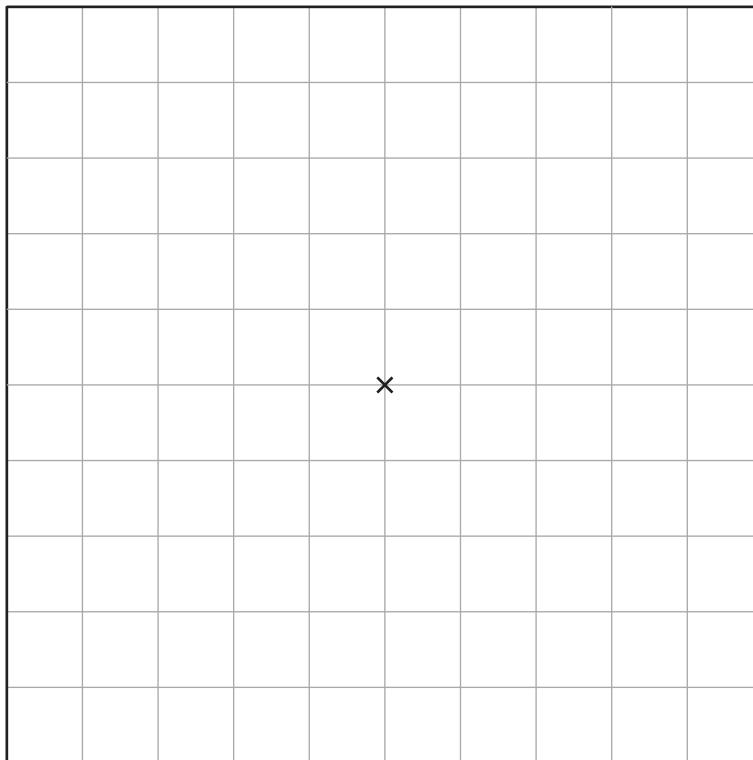The diagram shows a circle inside a square.

Not drawn
accurately

The diagram is used on a flag.

2 (a) Draw a circle, radius 4 cm, inside the square.
The centre of the circle is marked with a cross.

[1 mark]

2 (b) A straight line is drawn on the diagram.
The line is

a diameter of the circle

parallel to the horizontal sides of the square.

Draw the line on your diagram in part (a).

[2 marks]

3 To draw a logo, follow these steps.

Step 1 Draw a square with side length 10 cm

Step 2 Draw a circle, with radius 5 cm, inside the square.

Step 3 On the circle, draw a vertical diameter and a horizontal diameter.

Step 4 Shade the top right quarter of the circle.

Draw the logo on the centimetre grid.

[4 marks]

4   Here are the instructions for drawing a logo.
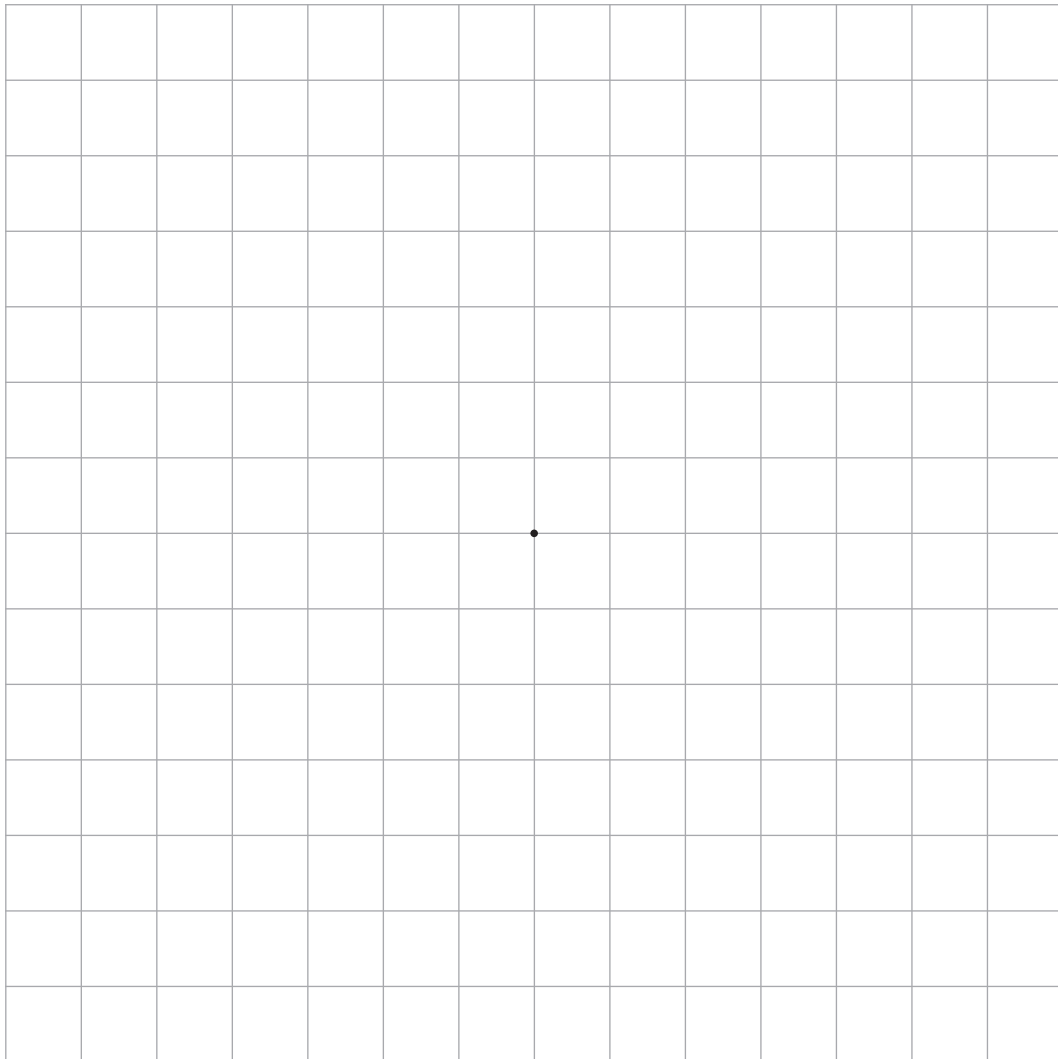
Draw a circle of radius 6 cm

Draw a **vertical** diameter on the circle.

Draw two chords, each of length 10 cm from the top of the vertical diameter.
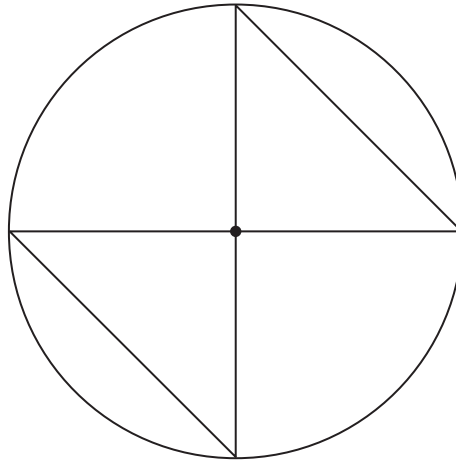
Draw the logo on the centimetre grid.
Use the point marked with a dot for the centre of your circle.

[3 marks]

5   A company logo is a circle with two right-angled triangles drawn inside.
The centre of the circle is marked with a dot.

5 (a)   Write down the order of rotational symmetry of the logo.

[1 mark]

Answer ....

5 (b)   Measure the diameter of the circle.
State the units of your answer.

[2 marks]

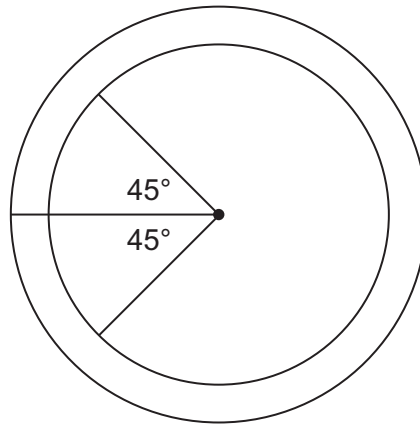Answer ....

5 (c) A different logo has

- **two** circles, radii 6 cm and 4 cm, with the same centre
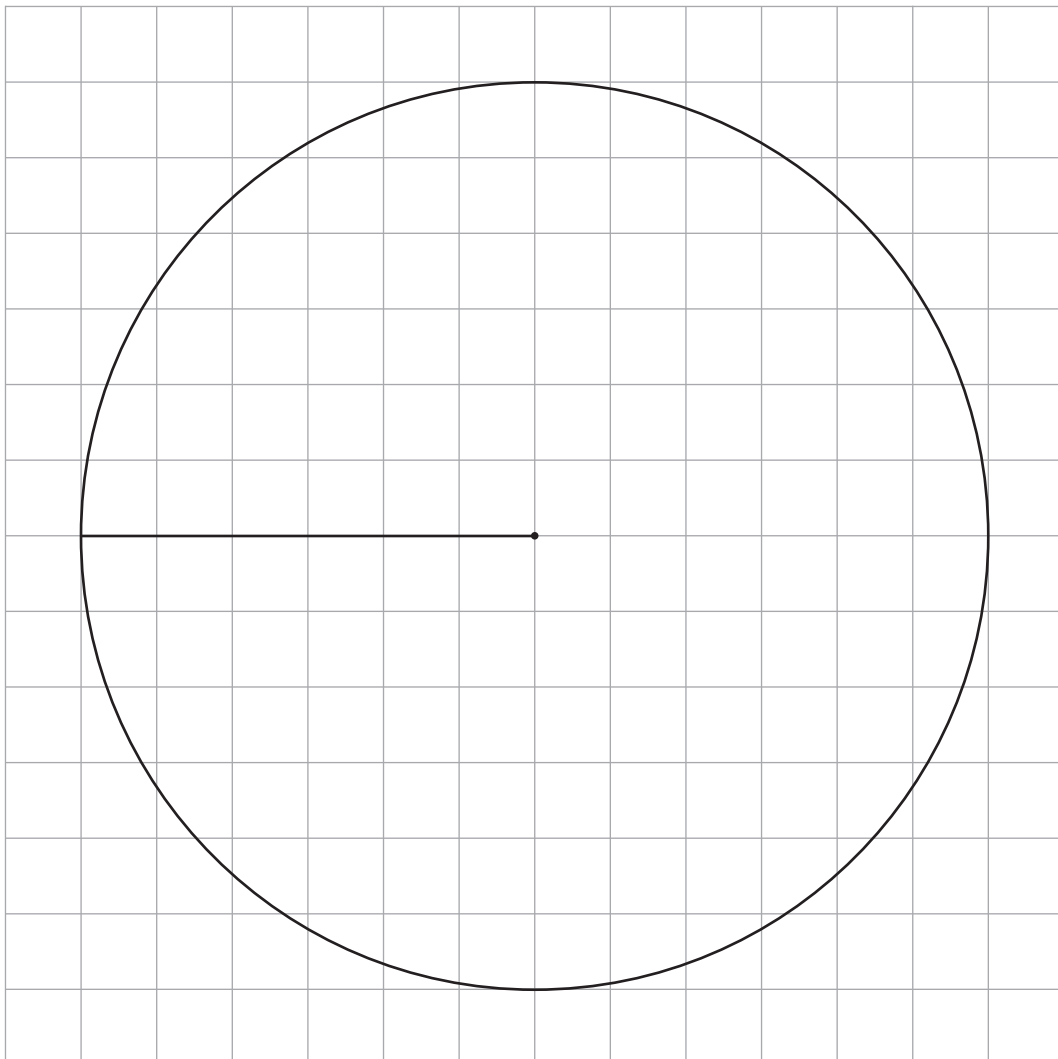- three straight lines drawn from the centre.

Here is a sketch of the logo.

Not drawn
accurately

45°

45°

Using a compass, protractor and ruler, complete this
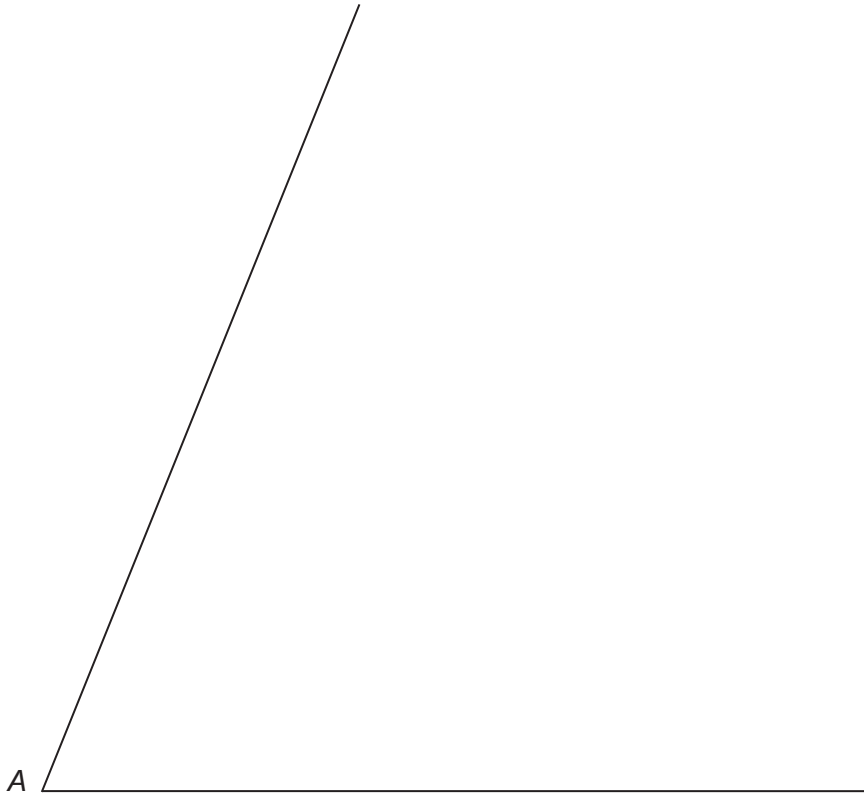accurate drawing of the logo on the centimetre grid. **[2 marks]**

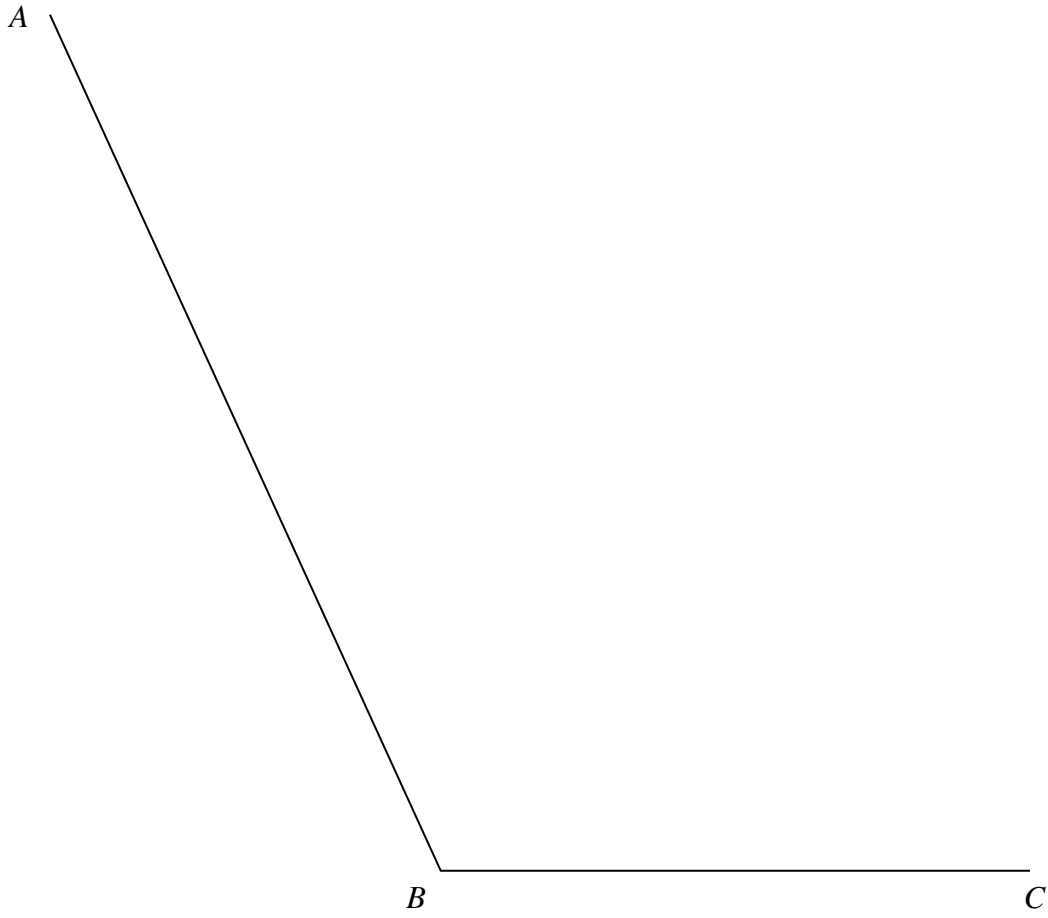**6** You will need a ruler and compasses to answer this question.

Construct the angle bisector of angle *A*.

[2 marks]

7 Using ruler and compasses, construct the bisector of angle ABC.

A

B

C

[2 marks]

8 You will need a ruler and a pair of compasses to answer this question.

Construct the perpendicular **from** point *P* to the line *L*.
You **must** show your construction arcs.

[3 marks]

P ×

L

9   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.

[3 marks]

_____

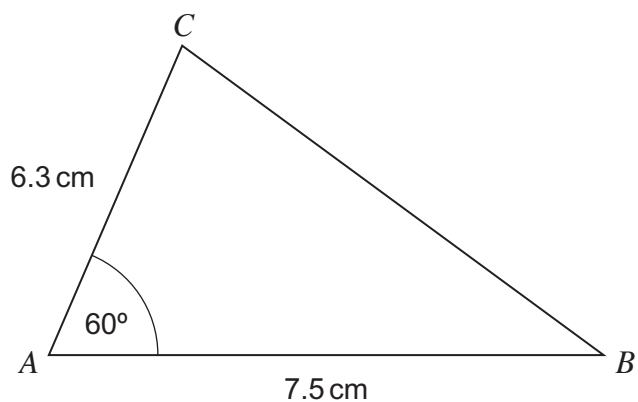**10** You will need a ruler and compasses for this question.

Draw accurately the locus of a point which is always 3 cm from the line.

[3 marks]

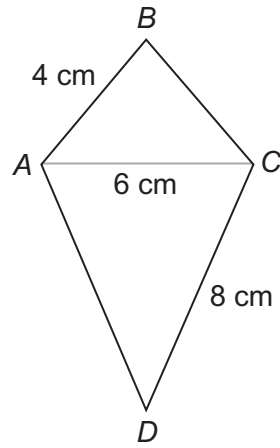**11**   The diagram shows a sketch of triangle ABC.

Not drawn
accurately

C

6.3 cm

60º

A

7.5 cm

B

Using ruler and compasses only, make an accurate drawing of triangle ABC.

[3 marks]
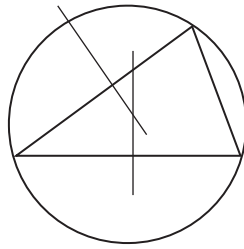
12 *ABCD* is a kite.

B

4 cm

Not drawn accurately

A

6 cm

C

8 cm

D

Using a ruler and compasses, make an accurate construction of the kite.
AC has been drawn for you.

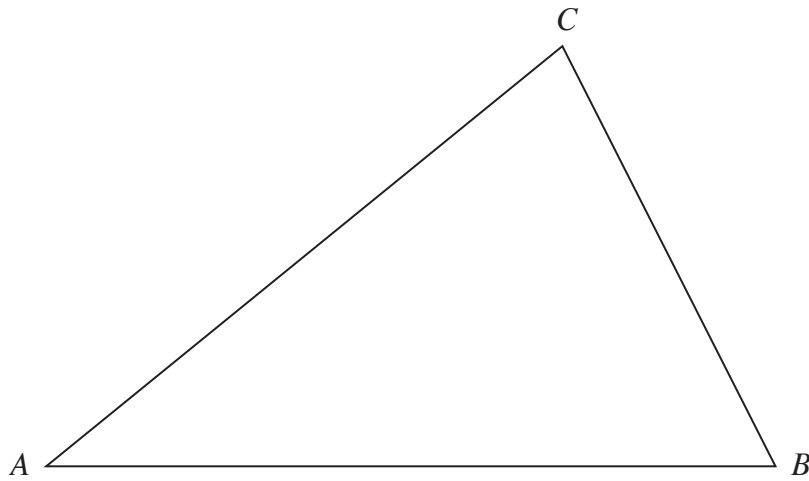**[3 marks]**

A ●————————————● C

13 Use these steps to construct a circle passing through the vertices of the triangle ABC.

- Construct the perpendicular bisector of AB.
- Construct the perpendicular bisector of AC.
- Use the point of intersection of the bisectors as the centre of the circle.
- Draw the circle through A, B and C.
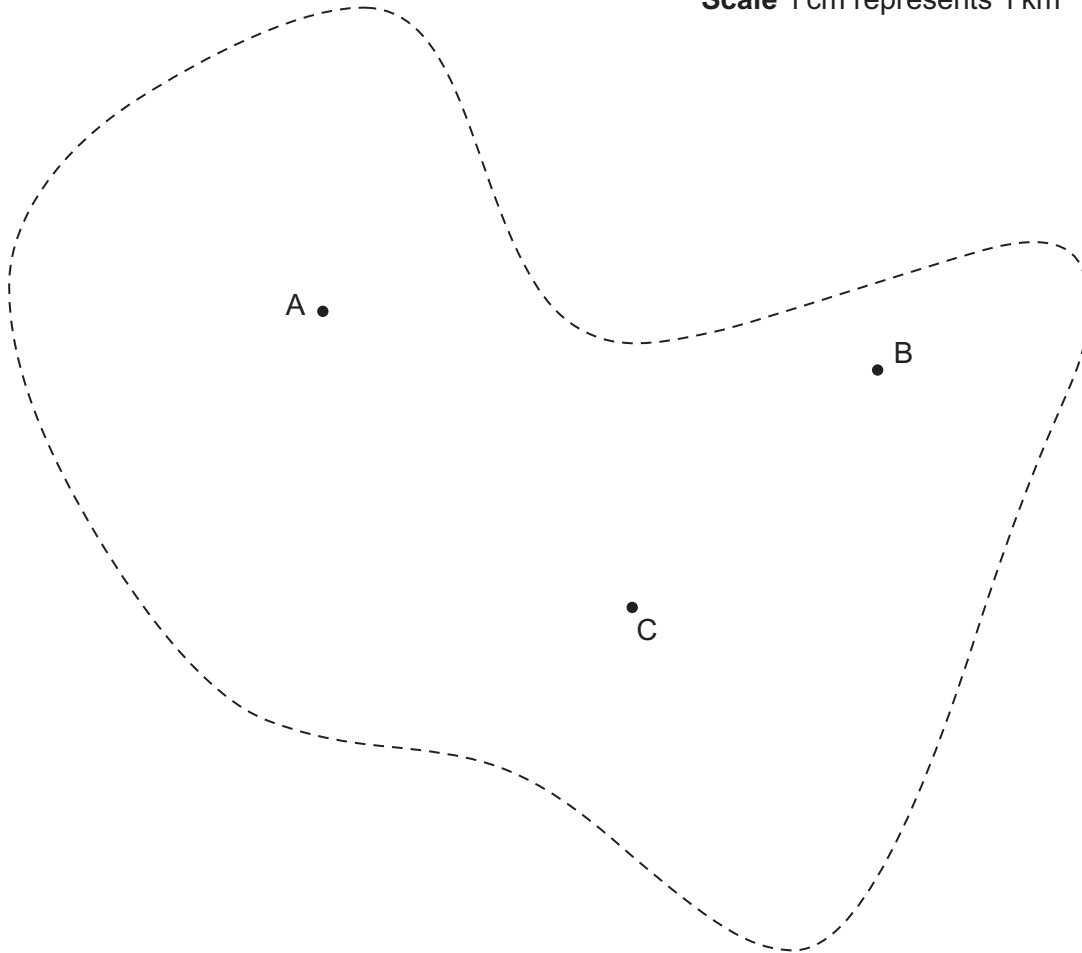
Show your construction arcs clearly.

[4 marks]

14 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

A •

• B

•
C

Places in the town have mobile phone coverage if they are

less than 4.5 km from A
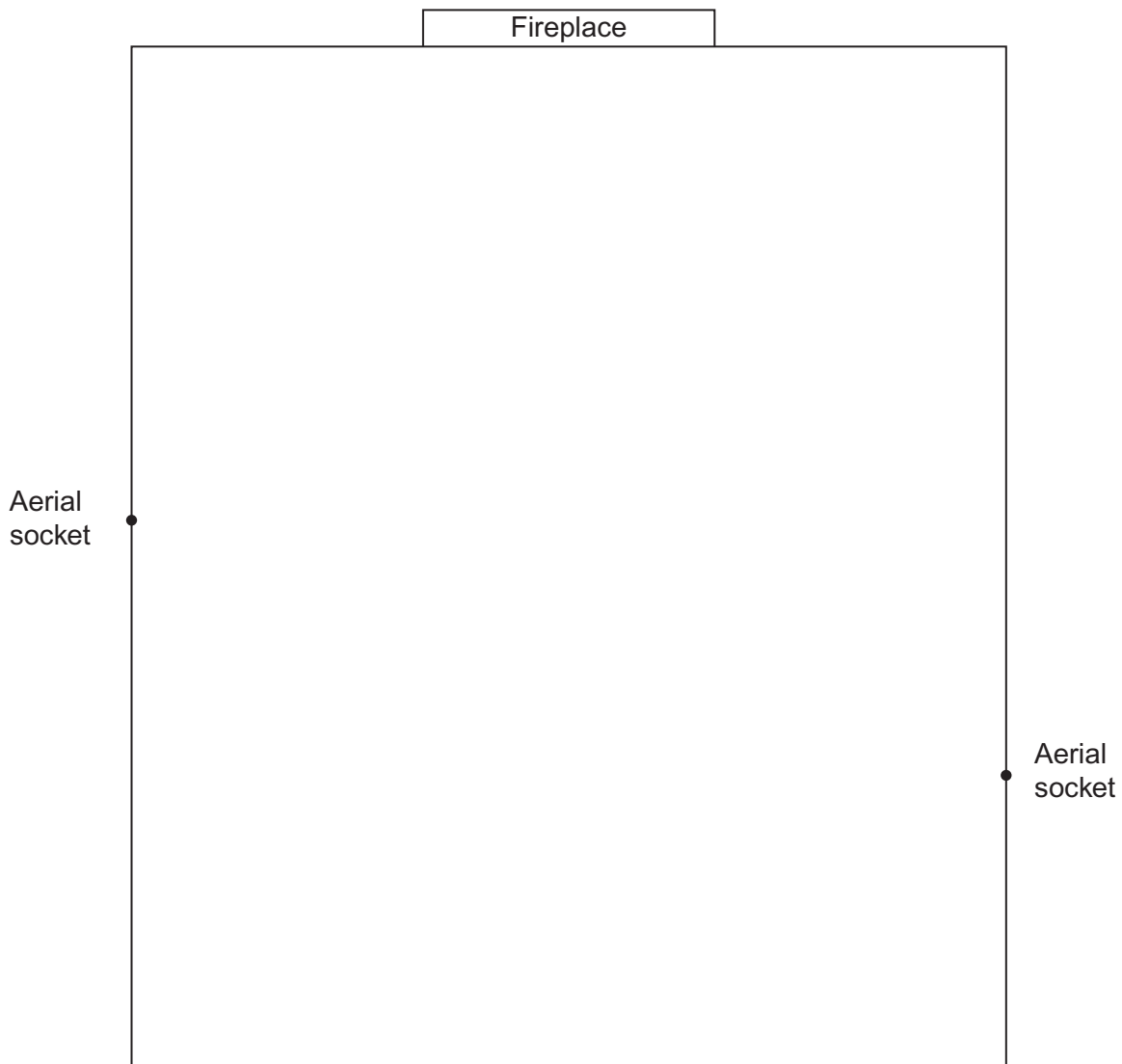**or**
less than 3.5 km from B
or
less than 3 km from C.

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

[4 marks]

15 The diagram shows the plan of a room.

Scale: 4 cm represents 1 m

Fireplace

Aerial socket

Aerial socket

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.
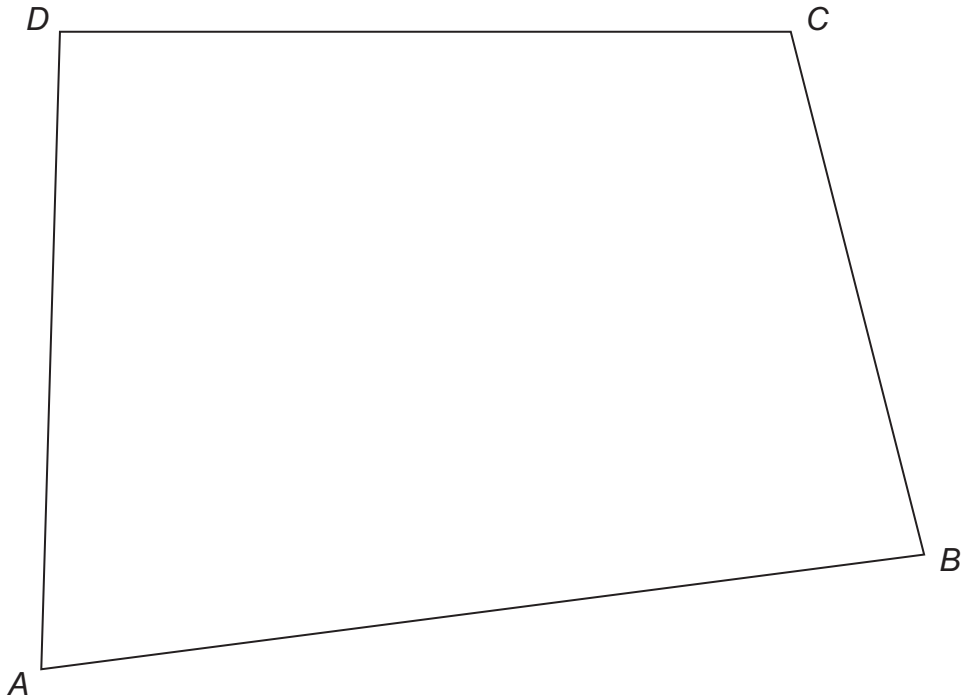
Use a ruler and compasses to show where the socket should be fitted.
Mark the position of the new socket with the letter S.

[4 marks]

16 *ABCD* is a scale drawing of a playground.

Scale: 1 centimetre represents 20 metres

A swing is placed 180 metres from A and 120 metres from B.

Use ruler and compasses only to show the position of the swing.
Mark the position *X*.

[3 marks]

17 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.

Drawn to scale

Garden

Hedge

20 m

D

E

Wall

Fence

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.

[3 marks]

*18

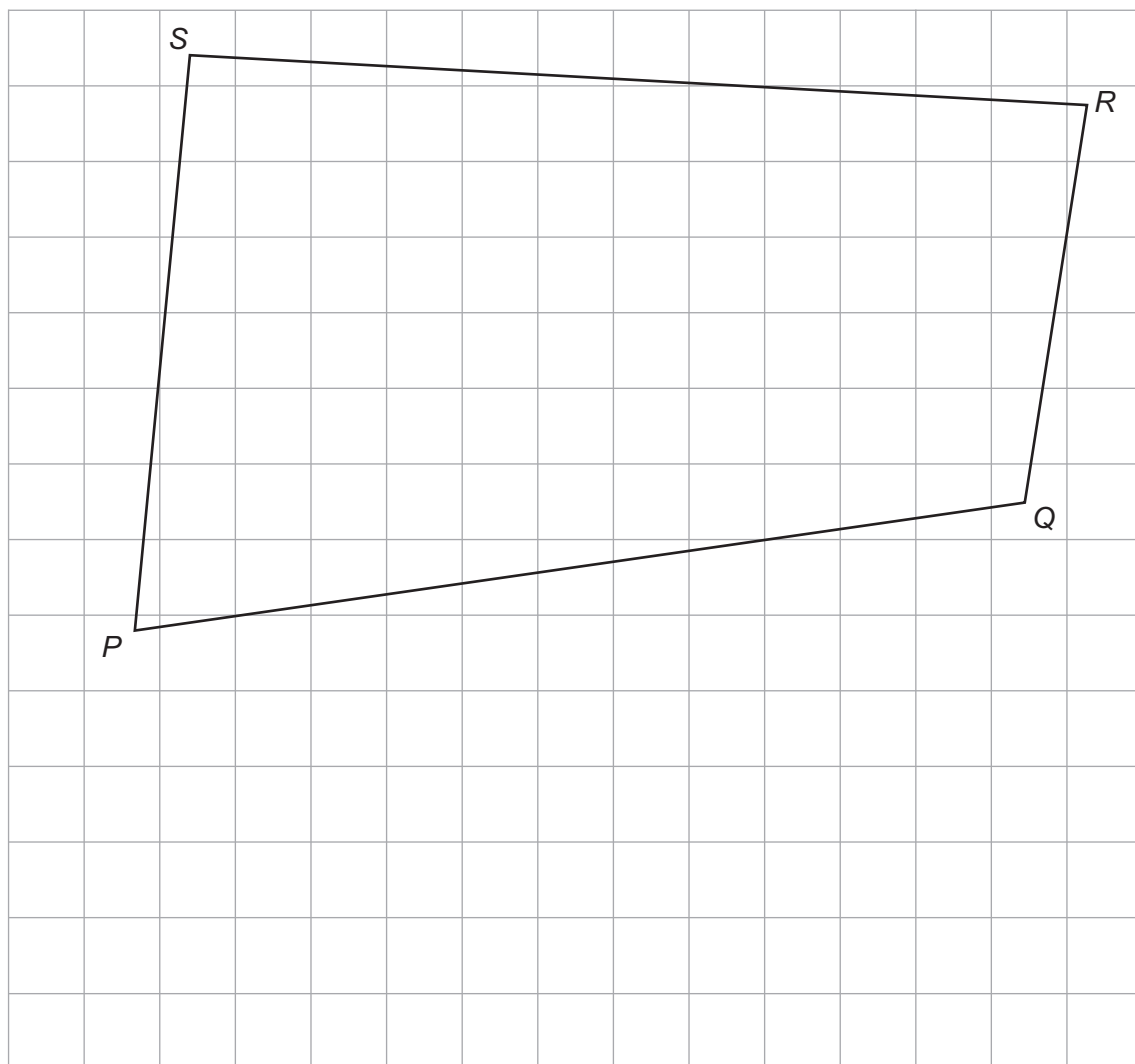You need a ruler and compasses to answer this question.

PQRS is a plan of a garden.

A straight path in the garden

- joins *PQ* to *SR*
- is perpendicular to *PQ*
- is the same distance from *P* and *Q*

Construct the position of the path.

[2 marks]

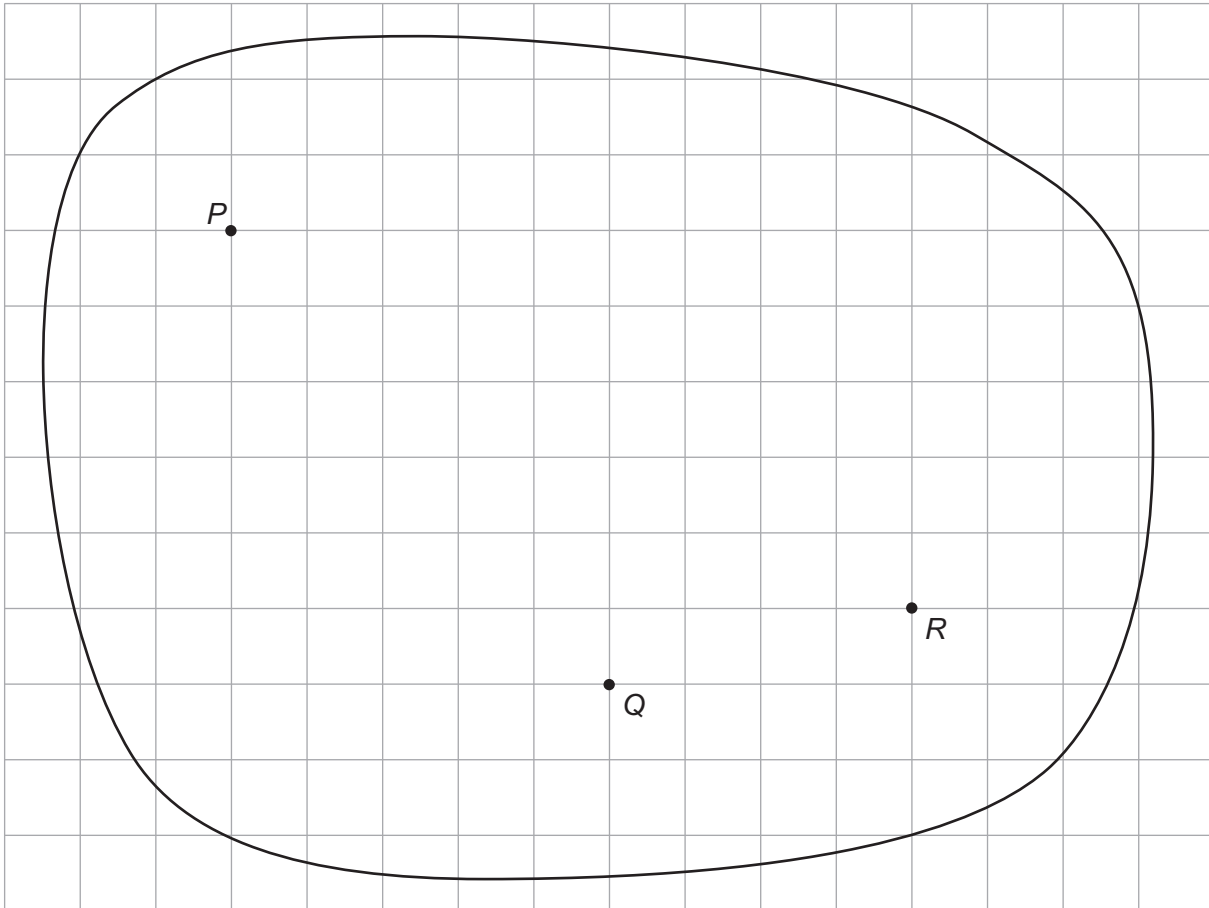**19** You will need a ruler and compasses to answer this question.

The scale drawing shows the positions of three trees, *P*, *Q* and *R* on an island.

Scale 1 cm represents 100 metres

Some treasure is buried

less than 500 metres from *P*

less than 750 metres from *R*
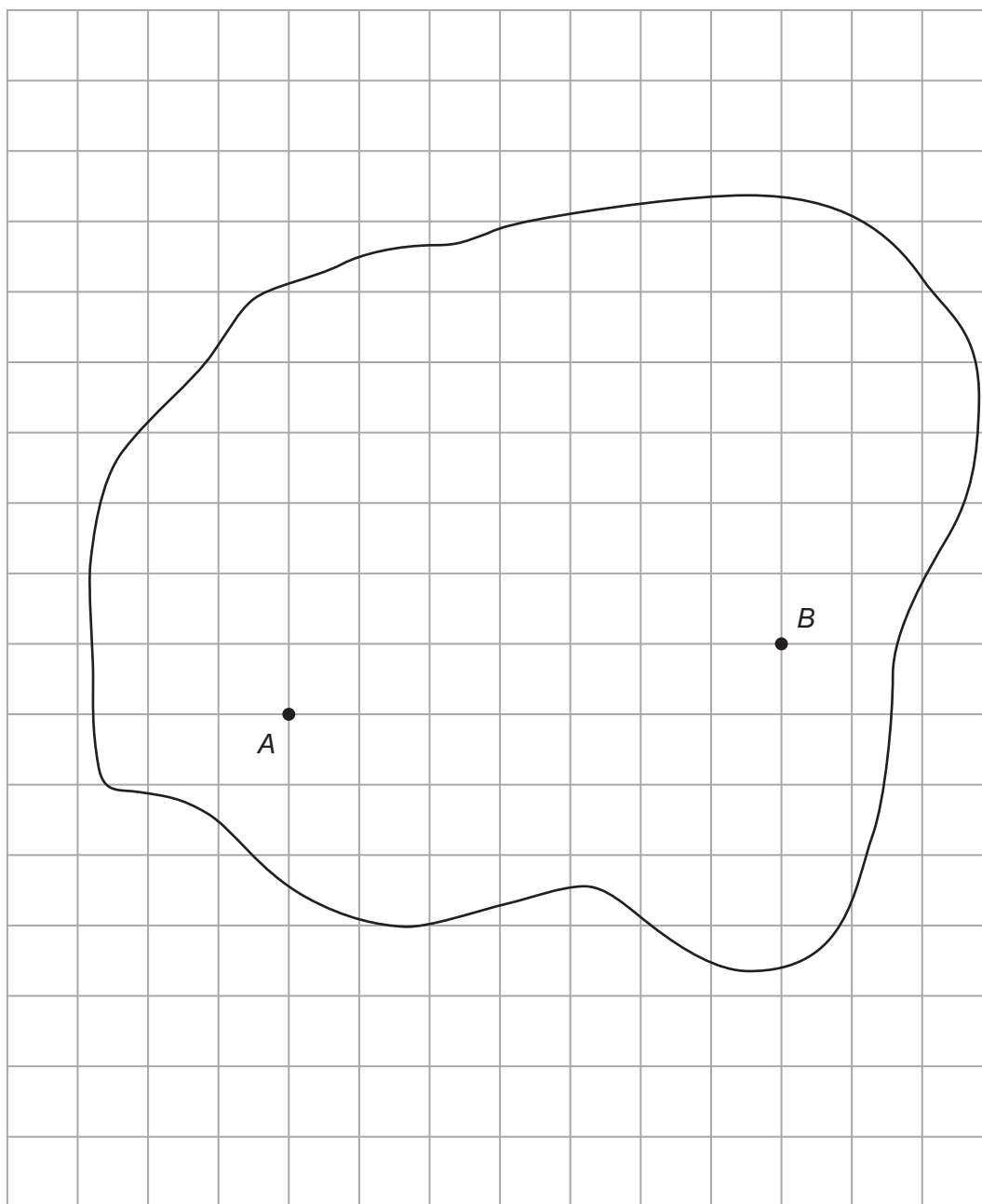
nearer to *P* than to *Q*.

Shade the region where the treasure could be.

[3 marks]

*20 You need a ruler and compasses to answer this question.

A map of an island is shown on the grid.

Treasure is buried on the island.
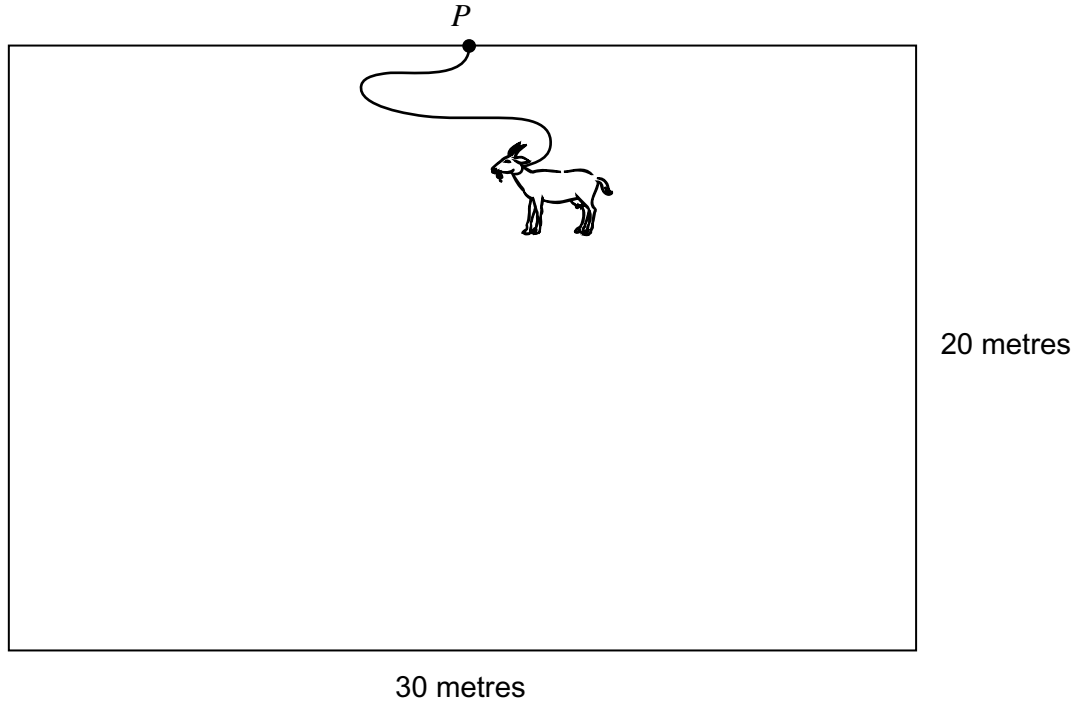The treasure is the same distance from *A* as it is from *B*.

Construct a line on the map to show **all** the places where the treasure could be.

[3 marks]

21 The diagram shows a rectangular grass field of length 30 metres and width 20 metres.
A post, *P*, is in the middle of one side of the field.
A goat is tied to the post by a rope of length 7.5 metres.
The goat can reach half a metre further than the length of the rope.

Not drawn accurately

P

20 metres

30 metres

Describe fully the shape of the area of grass that the goat can eat.

....

....
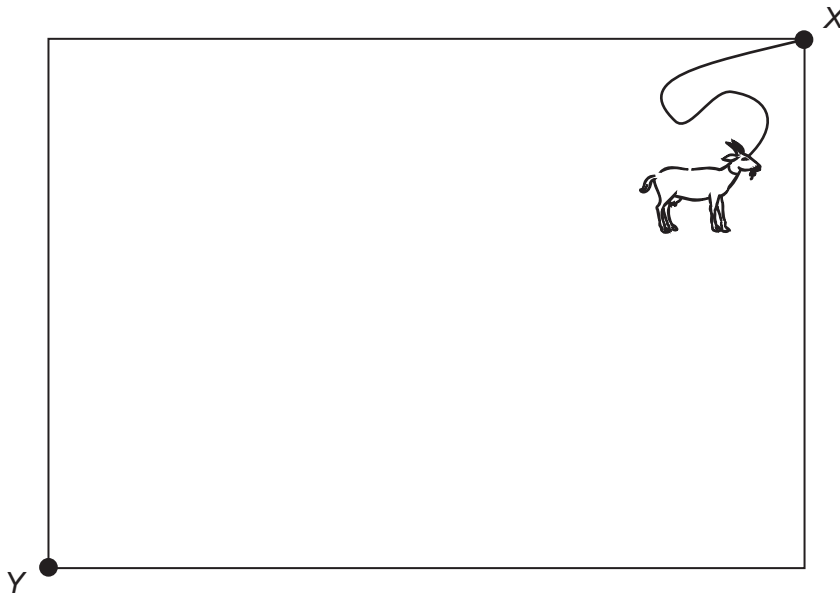
[2 marks]

22 A scale diagram of a rectangular field is shown.

Scale : 1 centimetre represents 2 metres

22 (a) A goat is tied to a post at *X* by a rope.
The goat can reach 8 metres from *X*.

Draw accurately on the scale diagram to show the area of the field the goat can reach.

[2 marks]

22 (b) A horse is tied to a post at *Y* by a different rope.
The areas of the field the horse and goat can reach do **not** overlap.

What is the longest possible length of this rope?

....

....

Answer .... metres   **[2 marks]**