Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Locus of Points 2

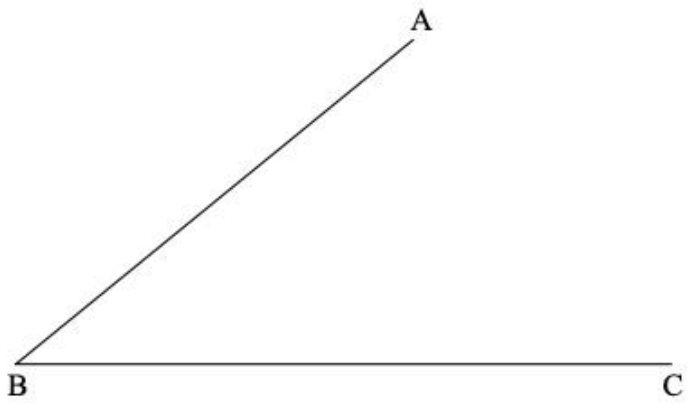
Calculator Allowed

INSTRUCTIONS TO CANDIDATES

- Write your name in the space provided.
- Write your answers in the spaces provided in this question paper.
- Answer ALL questions.
- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
- You should have a ruler, compass and protractor where required.

Total Marks :

1) In the diagram below the lines AB and BC meet at point B.



On the above diagram:

a) draw the locus of points equidistant from B and C.

b) draw the locus of points equidistant from AB and BC.

c) shade the region consisting of all points that are nearer to B than to C **and** nearer to AB than to BC.

(3 marks)

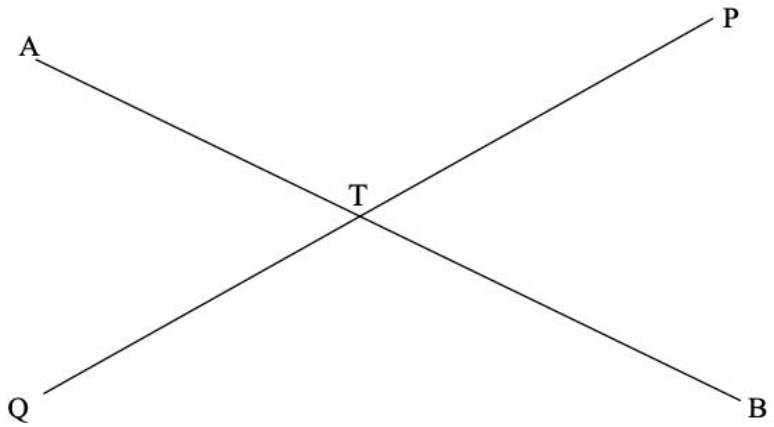
2) Lines AB and PQ intersect at T.

(a) Use ruler and compasses only to:

(i) Construct the locus of points which are equidistant from the lines AB and PQ.

(ii) Draw the locus of the points 3 cm away from T.

(b) Mark, each with an ×, **all the points** that satisfy both the loci in (i) and (ii).



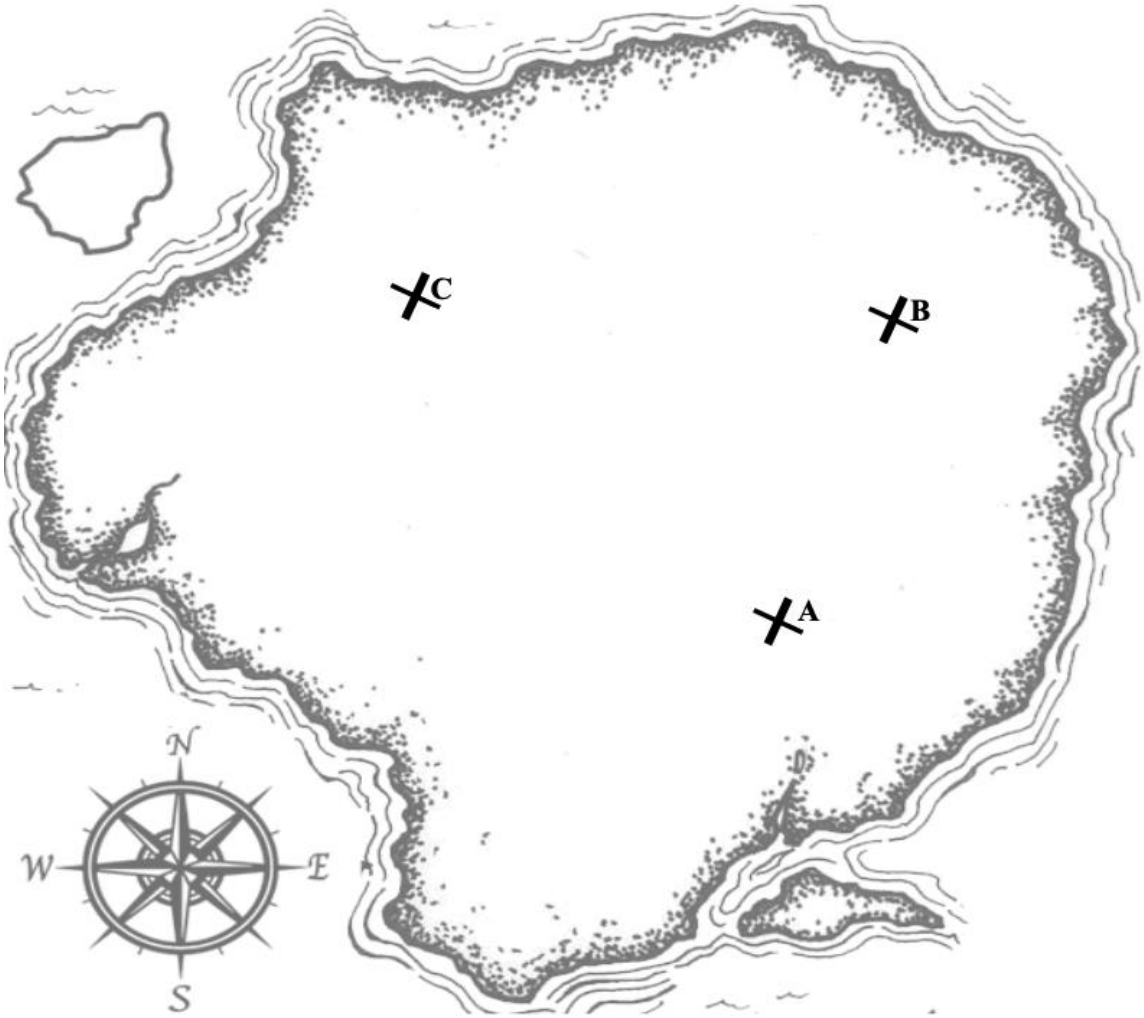
(5 marks)

3) On this map, using ruler and compasses only, construct:

a) The locus of points 3 cm away from point A.

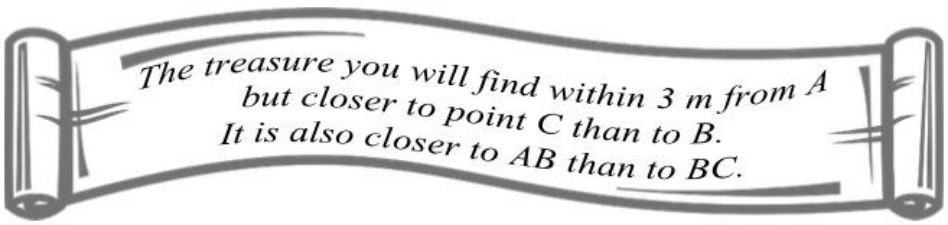
b) The locus of points equidistant from B and C.

c) The locus of points equidistant from AB and BC.



The above is a map of a treasure island with a scale of 1 cm = 1 m.

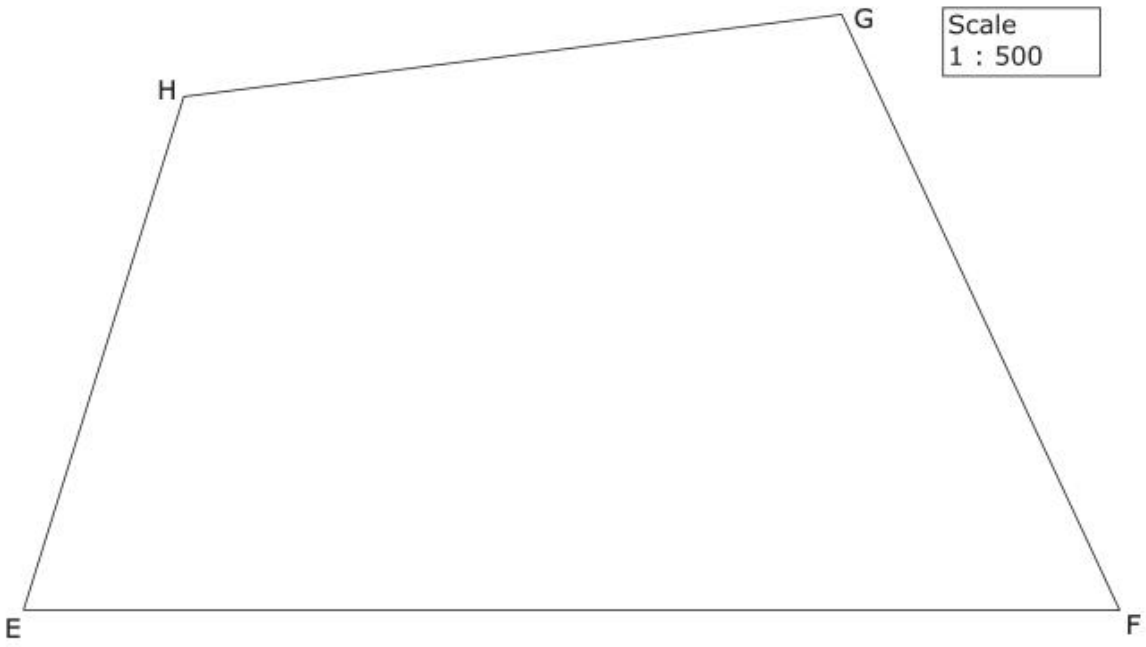
Jack finds this treasure map along with the following clues.



d) Using your constructions on the map above, shade the region where the treasure is hidden.

(6 marks)

4) A scale drawing of a field EFGH is shown below.



(a) Use the given scale diagram to determine the actual length of the side HG of the field.

Answer .....m (2)

(b) Using ruler and compasses only, draw constructions on the scale diagram above to represent the following:

(i) The locus of points within the field at a distance of 50 m from point F.

(2)

(ii) The locus of points which are equidistant from the points E and G.

(2)

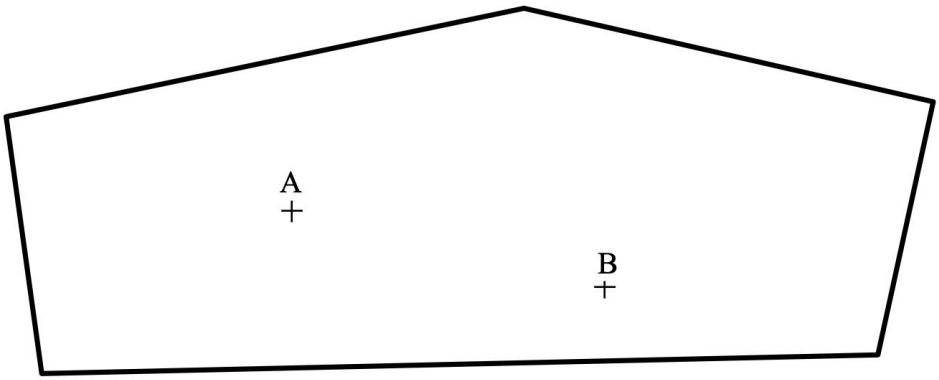
(iii) Label the point of intersection of the two loci as X.

(1)

5) Below is a scale diagram of a pool where **A** and **B** are two fixed buoys.

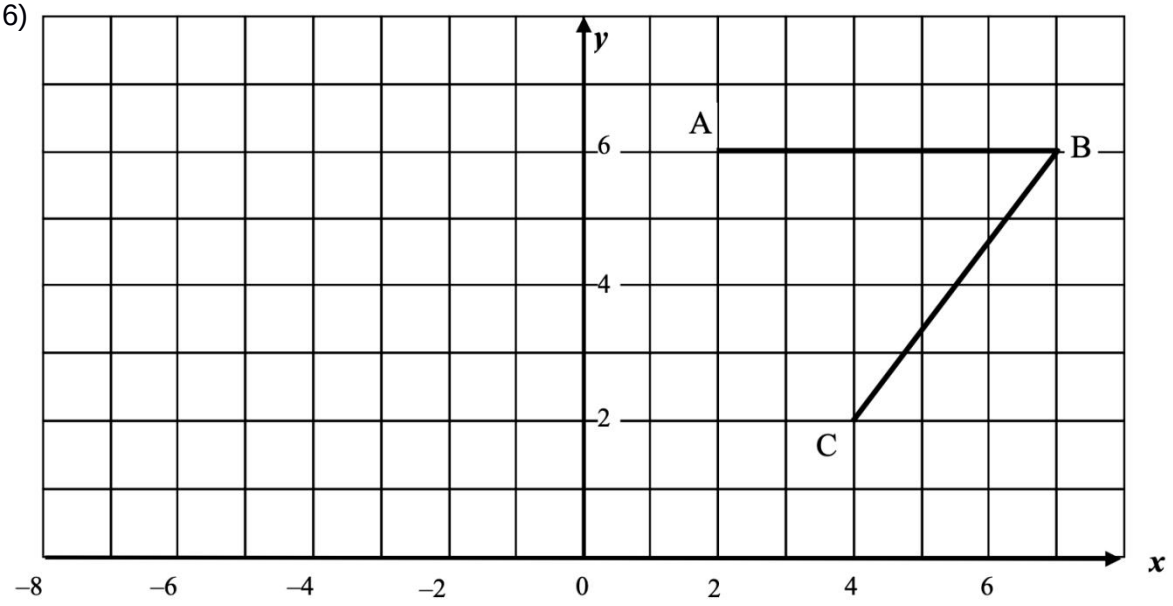
a) Using ruler and compasses only, construct the locus of points equidistant from A and B.

b) There are people inside the pool. On the diagram shade the region inside the pool where people are **closer** to A than to B.



(4 marks)

6)



a) Draw the image of shape ABC after a 90° anticlockwise rotation with centre (0, 0). Label it A`B`C`.

b) **Using ruler and compasses only,** construct the locus of points which are equidistant from the lines AB and BC.

(4 marks)

7) *In this question use ruler and compasses only.*

a) Starting from point A, draw a line AB of length 6 cm.

b) Construct the locus of points equidistant from A and B. Let this locus intersect the line AB at point P.

c) Draw the locus of points 4 cm away from P.

(5 marks)

8) The diagram shows the position of three palm trees, A, B and C in a garden. The diagram is drawn to scale.

(i) Use the diagram to construct the locus of points which are equidistant from trees A and B.

2 marks

(ii) On the same diagram, construct the locus of points which are equidistant from trees A and C.

2 marks

(iii) Name the point where the two loci obtained in the previous parts of the question meet as P. Explain why P is equidistant from all three points A, B and C.

2 marks

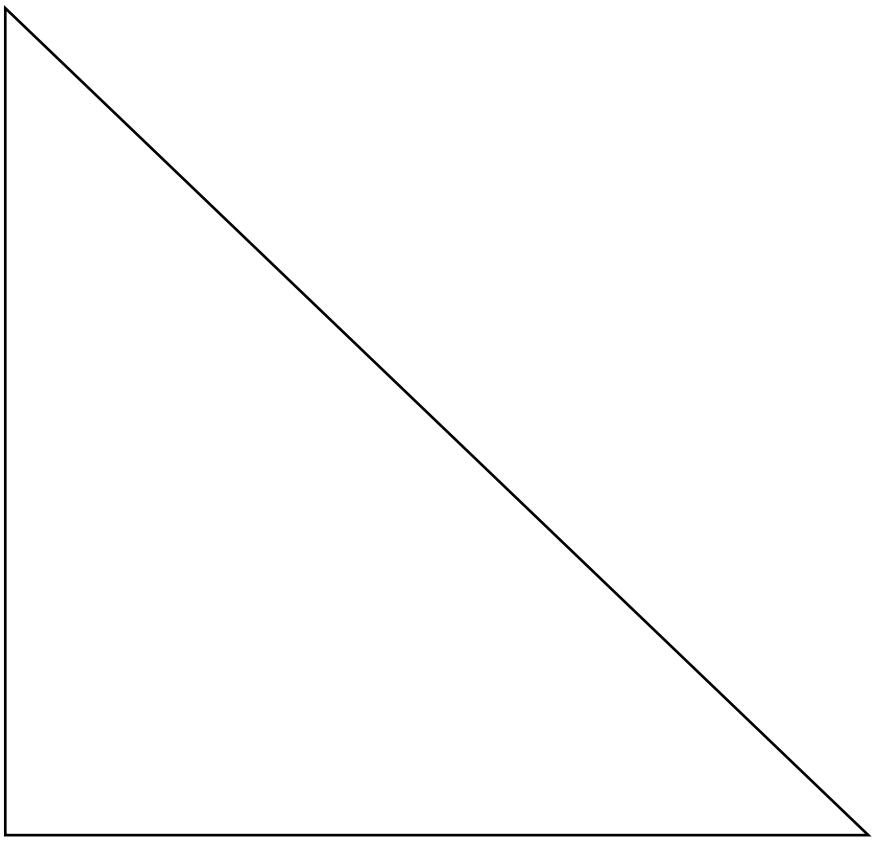
(iv) Draw a circle passing through all three points A, B and C and measure the radius of this circle.

3 marks

9)

a) In the triangle ABC, B is 90°, Point A is north of B and Point C is east of B. Label these on the diagram below.

[1]



(b) Draw the locus of points inside the triangle which are 7 cm away from B.

(2)

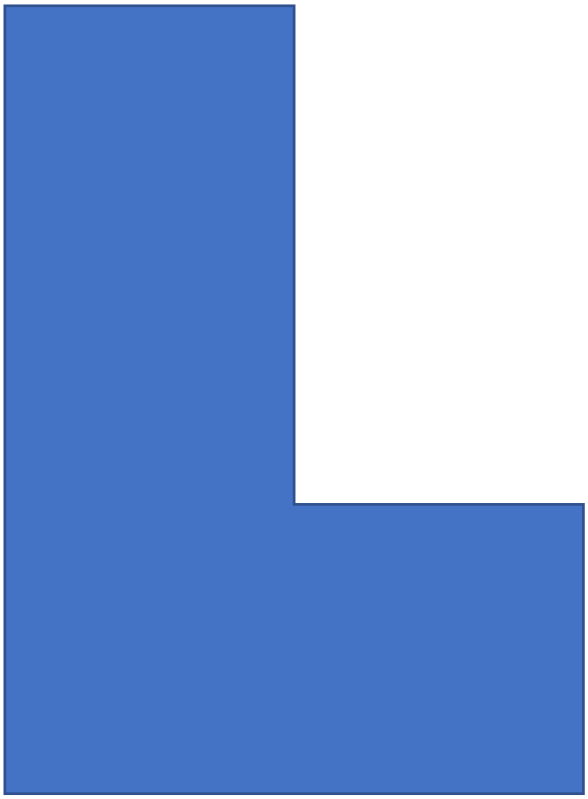
(c) Draw the locus of points which are equidistant from points A and C.

(2)

(d) The two loci described in parts (b) and (c) meet at point D.
Mark point D and measure the distance CD.

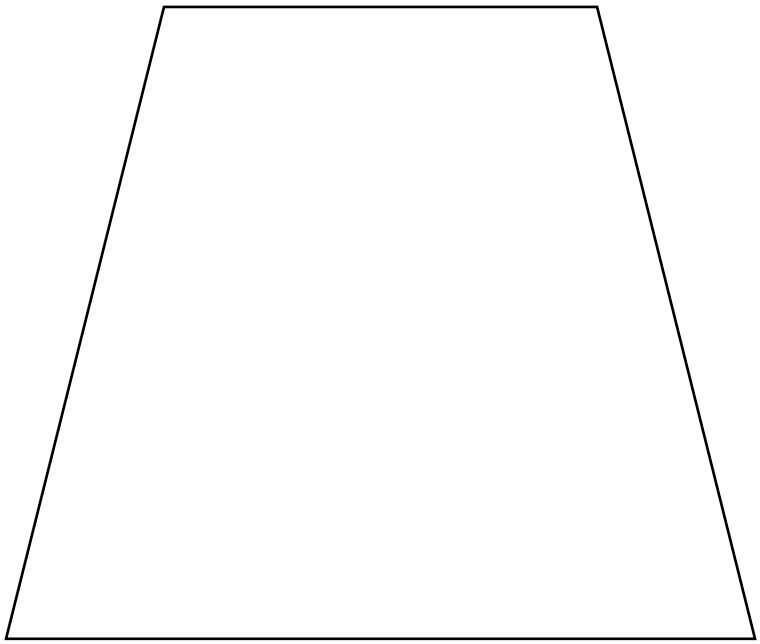
(1)

10) A scale diagram of a swimming pool shown below. Romero wants to put a path around the outside of his pool. Construct a 4cm locus of the path using only a compass and a ruler.



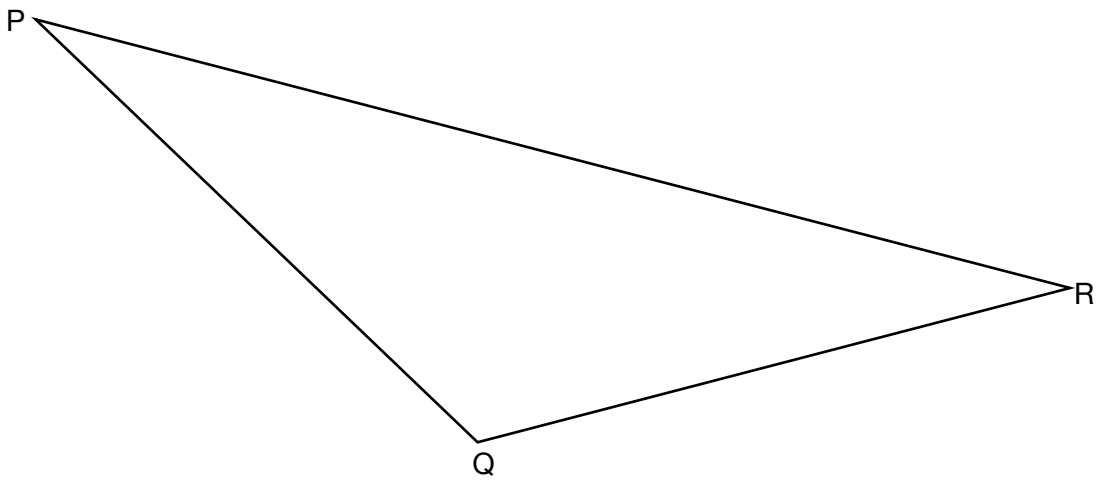
(4 marks)

11) Aisha was told that if she bisects all the corners of a trapezium, all the bisectors will meet at a single point. She believed it would be only 2 bisectors would at the same point. Has Aisha been told the truth, or is she correct, or are none of these statements true?



(5 marks)

12) The shape below, PQR represents a field.



a) Draw the locus of the points equidistant from the lines PQ and PR

b) Draw the locus of the points equidistant from the points P and R.

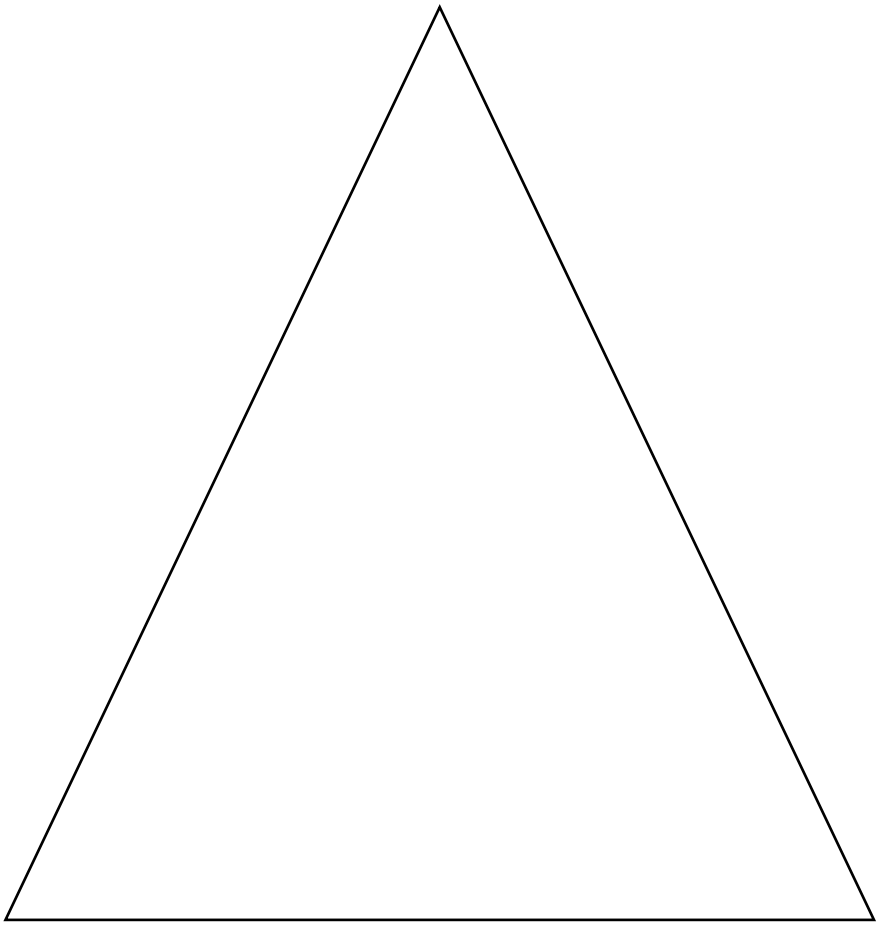
c) A coin is dropped in to the field. It is in a region which is closer to point P than to point R, and closer to the side PR than the side PQ. Shade in the region where the coin could be found.

(8 marks)

13) Using only a rule and a compass construct

a) In the triangle ABC, B is 90°, Point A is north of B and C and Point C is west of B. Label these on the diagram below.

(1 mark)



i. the locus of a point P such that P is equidistant from A and B

(1 mark)

ii. the locus of a point Q such that CQ < 3.5cm

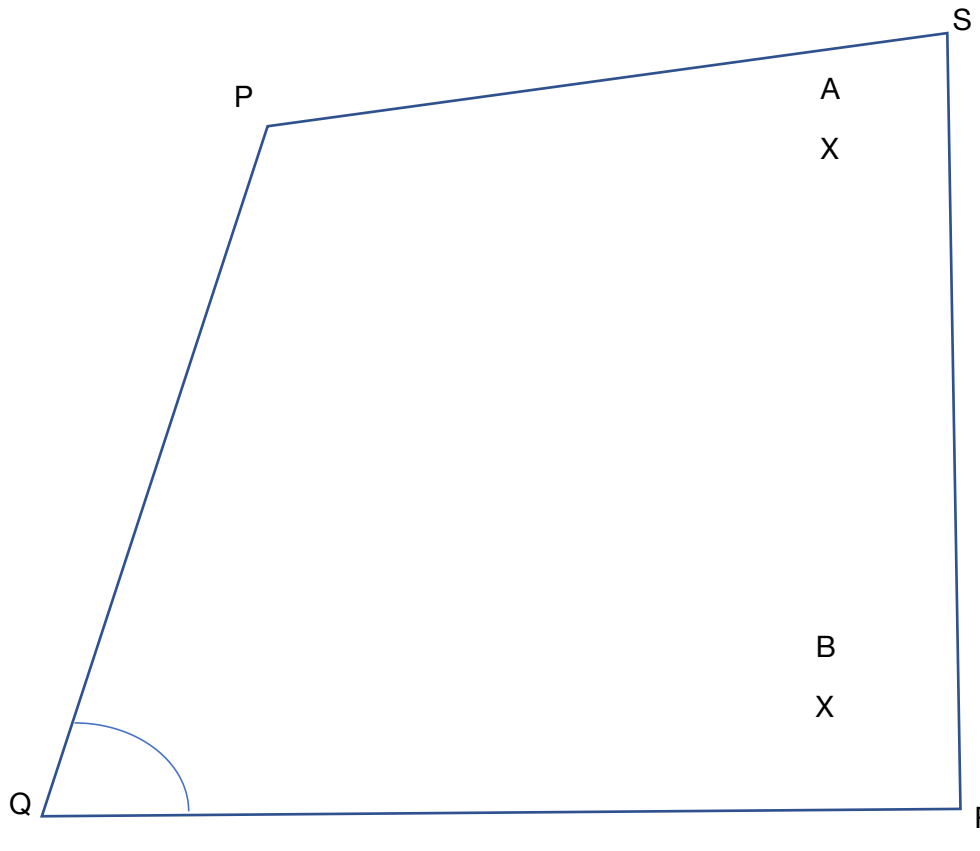
(1 mark)

b) On the diagram drawn in part a):

Shade the region and label it R, containing all the points enclosed by the locus of P and the locus of Q, such that AP≥ BP.

(2 marks)

14) The diagram below shows a sketch of a garden.



(6 marks)

The diagram you have drawn shows a garden to scale of 1:400. In the garden, A and B are trees (shown by X next to each one). The gardener wishes to plant more trees.

There are a number of rules he wishes to follow.

Rule 1 : Each new tree must be a equal distance from both trees A and B.

Rule 2 : Each new tree must be at least 4m from the edges of the garden.

Rule 3 : Each new tree must be at least 14m from B.

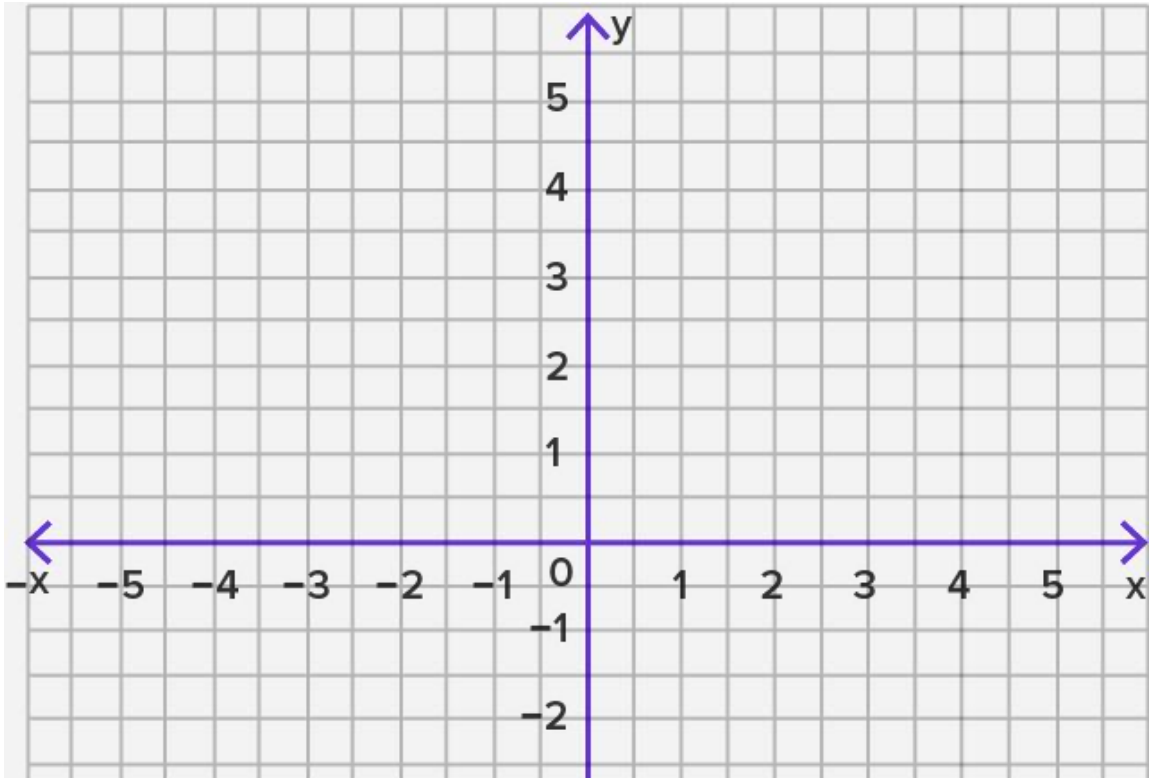
a) draw the locus given by each of these rules on the diagram.

(3 marks)

b) If the new trees are to be planted 4m apart, show on your diagram the possible planting points for the new trees.

(2 marks)

15) Plot the points **A**(1,2), **B**(0,4), **C**(-2,-2) and **D**(-3,0) on the axis below.



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a) Join the ABCD to make a quadrilateral. What is the name of this quadrilateral?

Answer.....[2].

b) Using only a ruler and a pair of compasses, construct:

i. The locus, l_1, of the points equidistant from **A** and **C**. [3]

ii. The locus, l_2, of the points equidistant from the lines **AC** and **BA**. [3]

iii. Write **M** at the point where l_1 and l_2 intersect. [1]

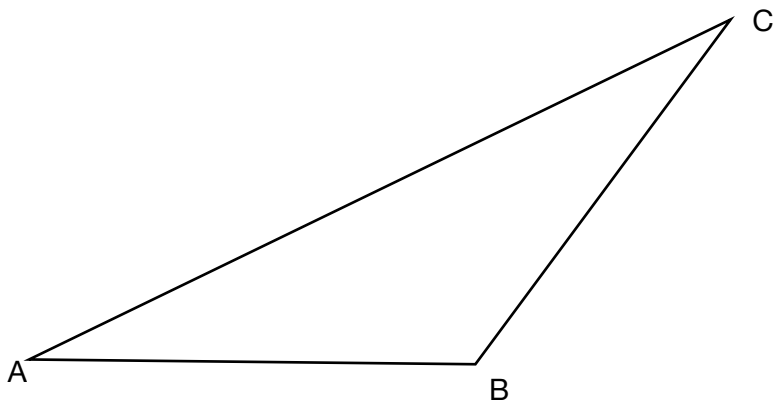
c) Measure, using a protractor, the angle MAB.

Answer.....[1].

d) What is the distance of M from A

Answer.....[1]

16) Below is the triangle ABC



a) Bisect each **side** of the triangle ABC and label where the 3 bisectors cross O.

b) Draw the locus of the point P, such that P is equidistant from a point O and passes through the vertices of the triangle

c) D is on the locus of P. It is equidistant from lines BC and BO. Q lies in the region enclosed by lines BD, BO (which is extended) and the locus of P. Shade the region Q.

(9 marks)