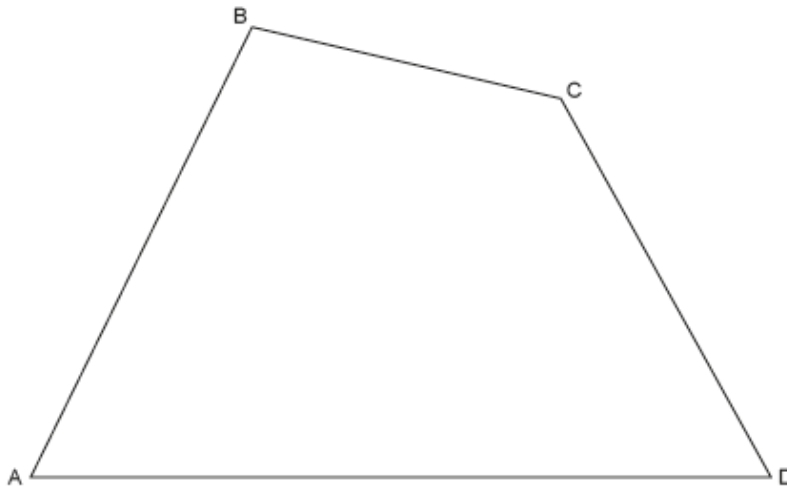**LOCI AND CONSTRUCTION**

OCR – Tuesday 03 November 2020- Morning - Paper 1 (Calculator) Foundation Tier

   1.

   23   ABCD is a quadrilateral.

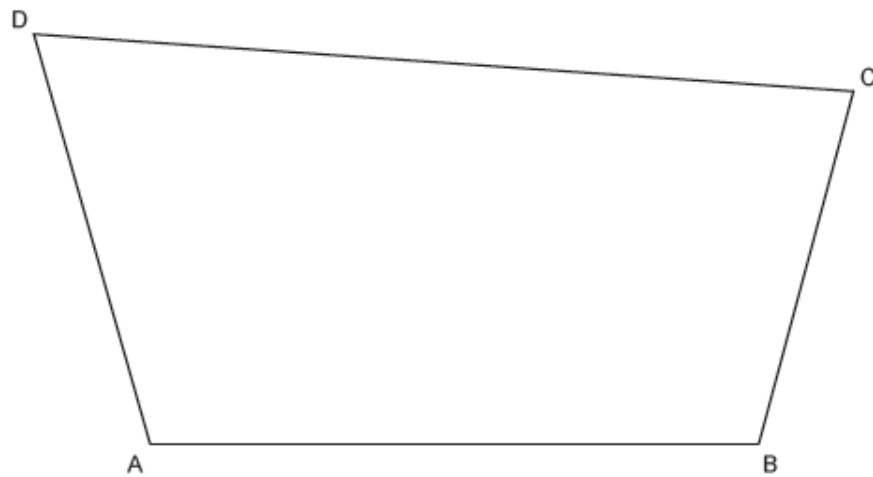
(a) Construct the bisector of angle ABC.
     Show all your construction lines.   [2]

(b) Construct the perpendicular bisector of BC.
     Show all your construction lines.   [2]

(c) Shade the region which is

   •   nearer to BC than to AB
   and
   •   nearer to B than to C.

                                                                                     [1]

2.

17 The diagram shows the scale drawing of a garden ABCD.

Scale: 1 cm represents 5m

A tree is to be planted in the garden so that it is

- at least 10 m from AB
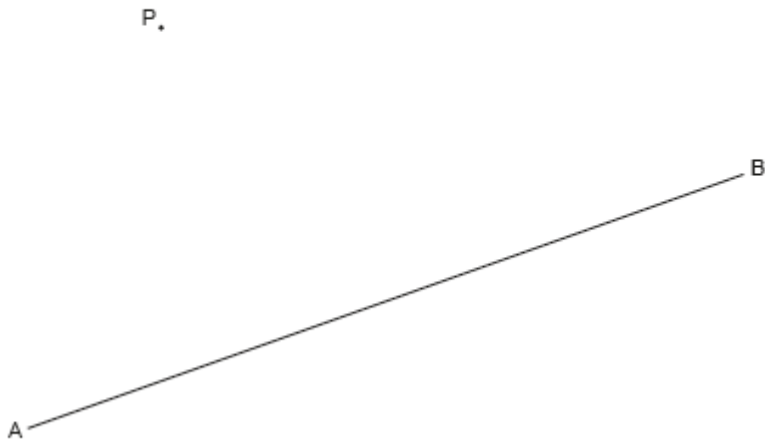
and
- closer to CD than CB

and
- at least 15 m from D.

Using a ruler and compasses only, construct and shade the region in which the tree can be planted.

[6]

3.

22 Construct the perpendicular from the point P to the line AB.
Show all of your construction lines.

P.

B

A

[2]

4.

19 The scale drawing shows Katy's garden ABCD.

Scale: 1cm represents 5m

Katy places a statue in the garden.

The statue is
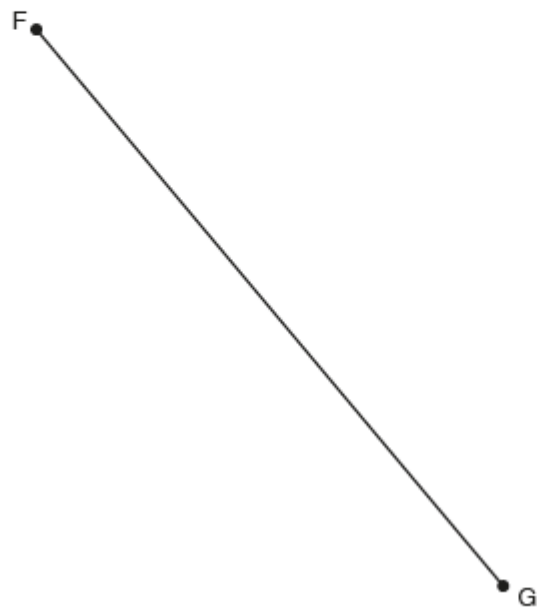
* more than 30m from D
* closer to CB than AB.

Construct and shade the region where the statue could be placed.
Show all your construction lines. [5]

5.

15 **Using ruler and compasses only**, construct the perpendicular bisector of FG.
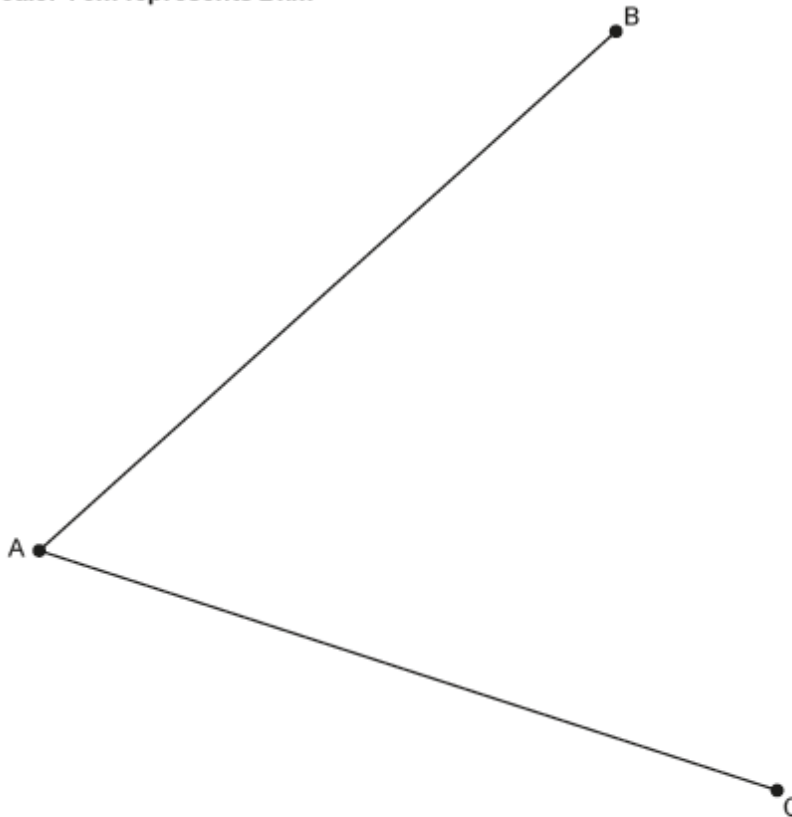
F•

•G

[2]

6.

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.

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

[5]

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

....

.... [1]

7.

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

B
•

C •

•
A

•
D

Scale: 1 cm represents 5 m

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

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

Show all your construction lines. [5]

(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).

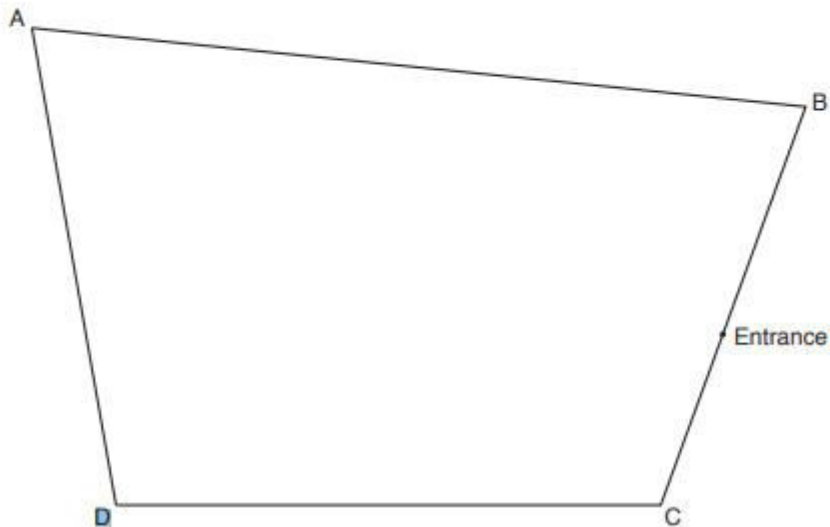Explain why there is only one position where Monty can plant his tree.

....

.... [1]

8.

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

Scale: 1 cm represents 10 m

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

Construct, using compasses and ruler only, the position of the water pipe.
You must show all your construction lines. [2]

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

(i) Construct, using compasses and ruler only, the position of the path.
Leave in all your construction lines. [2]

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

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

9.

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

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]**

10.

17 **(a)** The scale of a map is 1 cm represents 25 m.

   (i) The length of a path is 240 m.

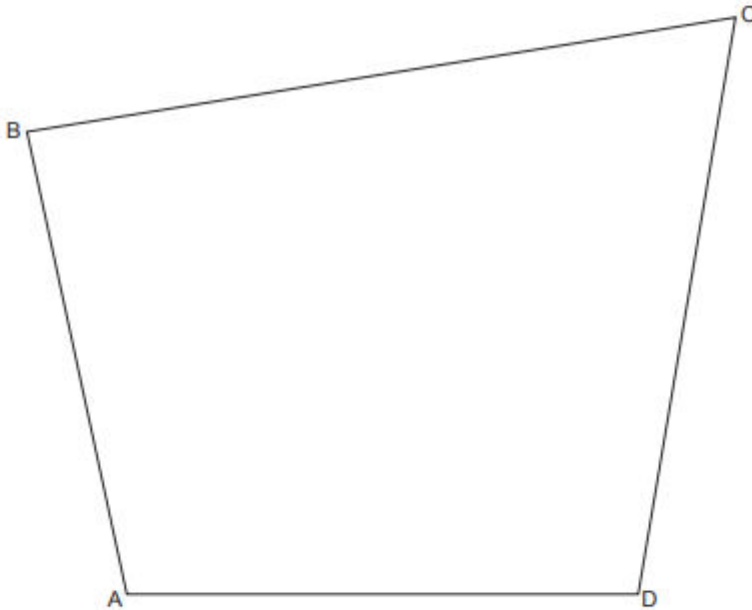   Work out the length, in centimetres, of the path on the map.

   (a)(i) ....cm **[1]**

   (ii) The scale 1 cm represents 25 m can be written in the form 1 : k.

   Find the value of k.

   (ii) $k =$ .... **[1]**

(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.
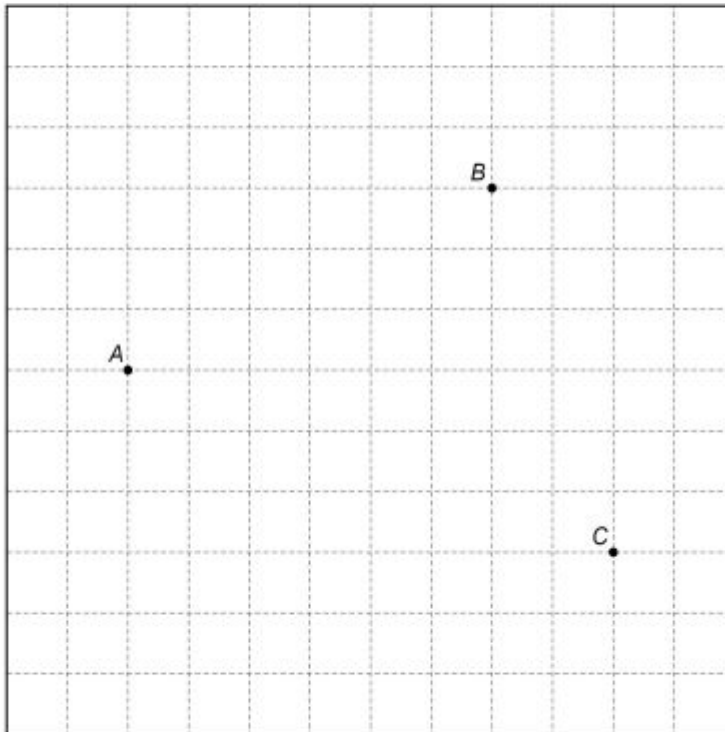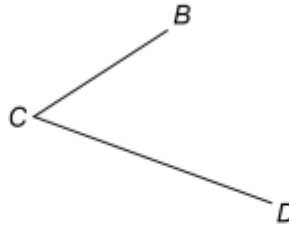   Show all your construction lines. **[5]**

11.

20   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.

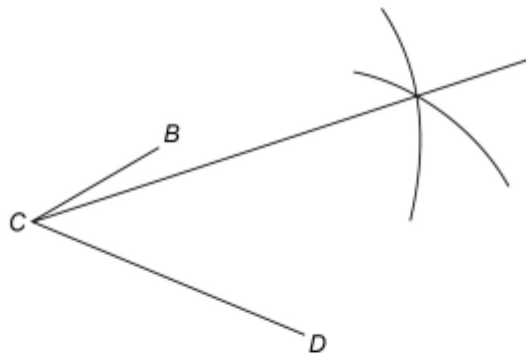Show all your construction lines.

[3 marks]

12.

21 (a)   Joe wants to bisect angle *BCD*.

Here is his method.

   Use a pair of compasses to draw arcs of the same radius from *B* and *D*.

   Draw a straight line from *C* through the intersection of the arcs.

Write down the error in his method.

[1 mark]

_____

_____

_____

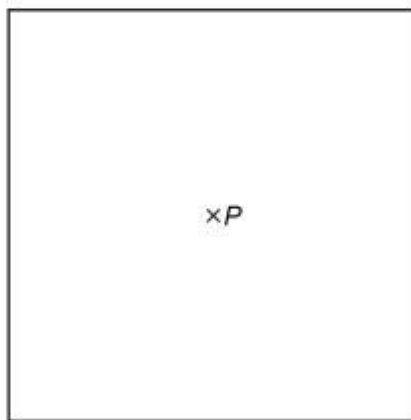**21 (b)** Kay wants to show all the points 3 km from point *P*.

Scale: 1 cm represents 1 km

×*P*

Here is her answer.   Scale: 1 cm represents 1 km

×*P*

What is wrong with her answer?

[1 mark]

_____

_____

_____

21 (c)   Here is a rectangle.

Using a pair of compasses and a straight edge, construct **one** line of symmetry.

Show clearly your construction arcs.
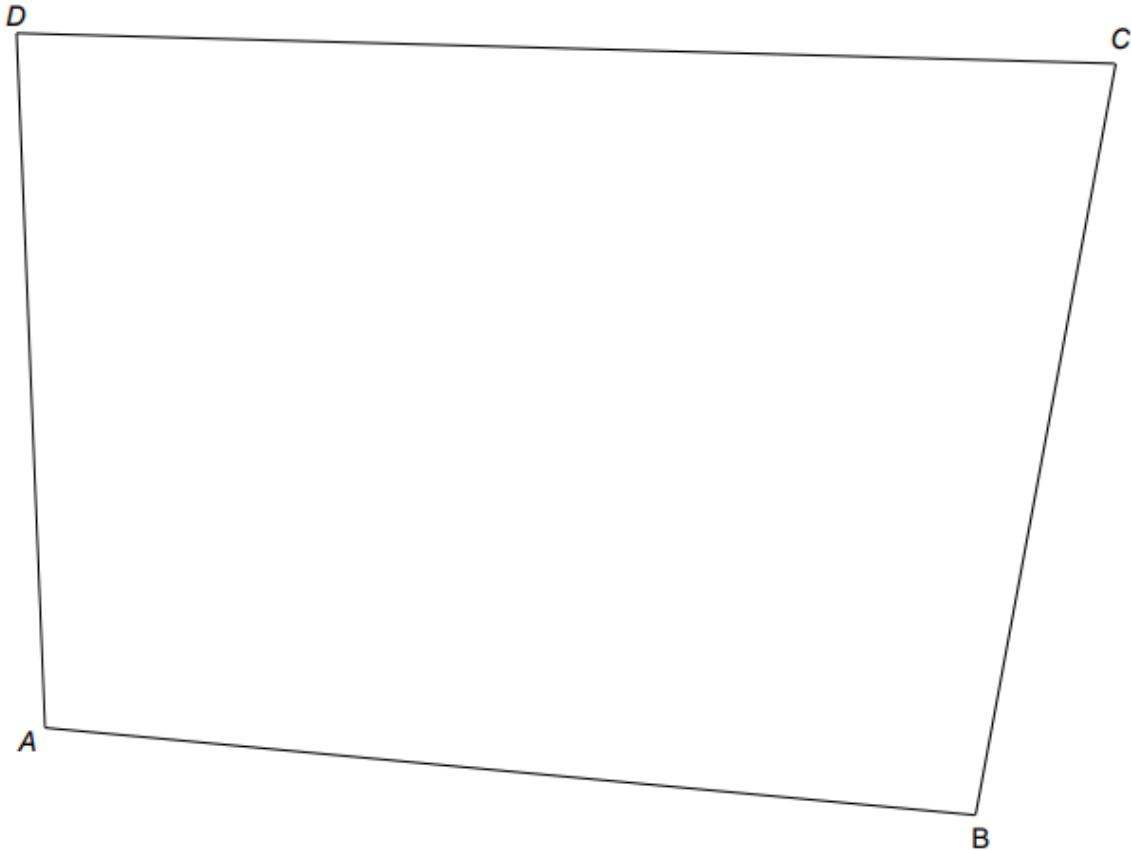
[2 marks]

13.

23   Use ruler and compasses to answer this question.

Point *P* is

- the same distance from *AB* and *AD*
- 6 cm from *C*.

Show the position of *P* on the diagram.

[3 marks]