

Construction

Question Paper 4

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Geometry
Sub-Topic	Construction
Booklet	Question Paper 4

Time Allowed: 68 minutes

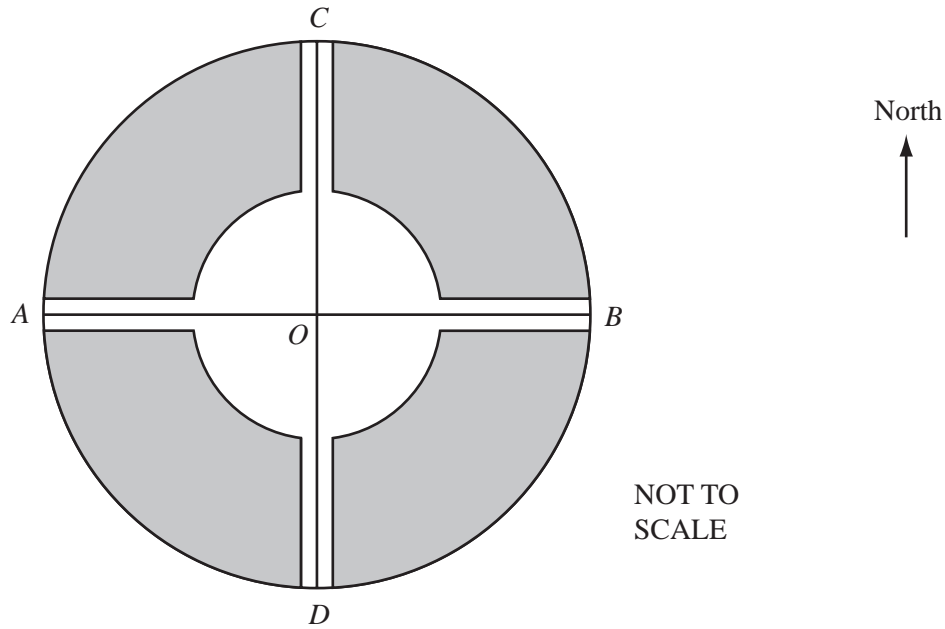
Score: /48

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1



The diagram shows a plan for a new city.

It is to be built inside a circle of radius 5 km.

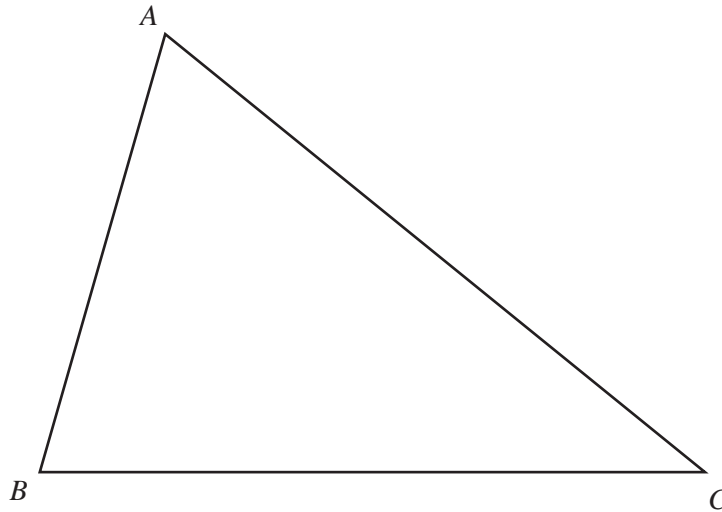
The areas where homes can be built are shaded on the diagram.

The homes must be at least 2 km from the centre of the city, O .

The homes must also be at least 0.5 km from two main roads CD and AB , which are in North-South and West-East directions.

- (a) Using 1 cm to represent 1 km, make an **accurate** scale drawing showing the areas for the homes. (You do not need to shade these areas.) [4]
- (b) The town hall, T , will be built so that it is equidistant from the roads OA and OC . It will be 1 km from O **and** West of CD .
- (i) On your scale drawing, using a straight edge and compasses only, draw the locus of points, inside the town, which are equidistant from OA and OC . [2]
- (ii) Mark and **label** the point T . [1]
- (c) The police station, P , will be built so that it is equidistant from T and B . It will be 3 km from O **and** North of AB . Showing all your construction lines, find and **label** the point P . [3]
- (d) What will be the actual straight line distance between the town hall and the police station? [1]

2

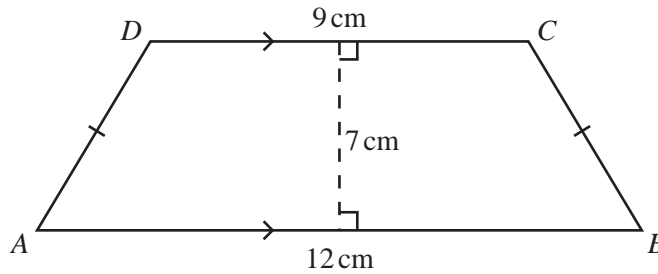


(a) In this part of the question use a straight edge and compasses only.

Leaving in your construction lines,

- (i) construct the angle bisector of angle ACB , [2]
 - (ii) construct the perpendicular bisector of AC . [2]
- (b) Draw the locus of all the points inside the triangle ABC which are 7 cm from C . [1]
- (c) Shade the region inside the triangle which is nearer to A than C , nearer to BC than AC and less than 7 cm from C . [1]

3 Answer the whole of this question on a new page.



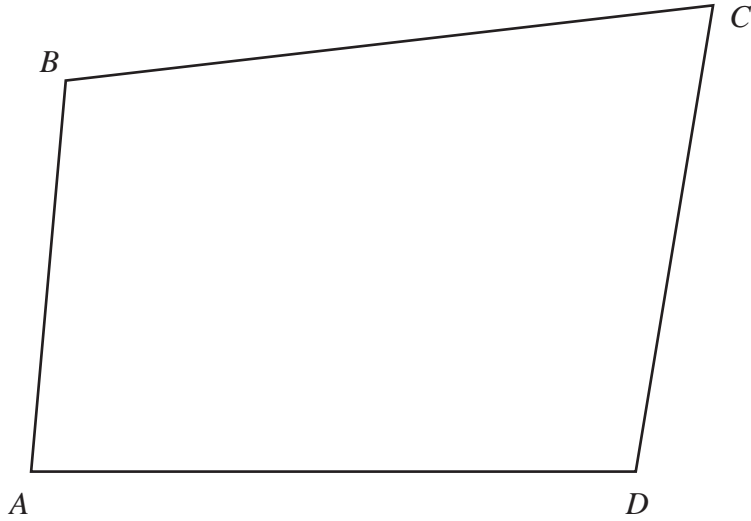
NOT TO
SCALE

The diagram shows a trapezium $ABCD$.

$AB = 12$ cm, $DC = 9$ cm and the perpendicular distance between these parallel sides is 7 cm.
 $AD = BC$.

- (a) Approximately halfway down your page, draw a line AB of length 12 cm. [1]
- (b) Using a straight edge and compasses only, construct the perpendicular bisector of AB . [2]
- (c) Complete an **accurate** drawing of the trapezium $ABCD$. [2]
- (d) **Measure** angle ABC , giving your answer correct to the nearest degree. [1]
- (e) Use trigonometry to calculate angle ABC .
Show all your working and give your answer correct to 1 decimal place. [2]
- (f) On your diagram,
- (i) draw the locus of points inside the trapezium which are 5 cm from D , [1]
 - (ii) using a straight edge and compasses only, construct the locus of points equidistant from DA and from DC , [2]
 - (iii) shade the region inside the trapezium containing points which are less than 5 cm from D **and** nearer to DA than to DC . [1]

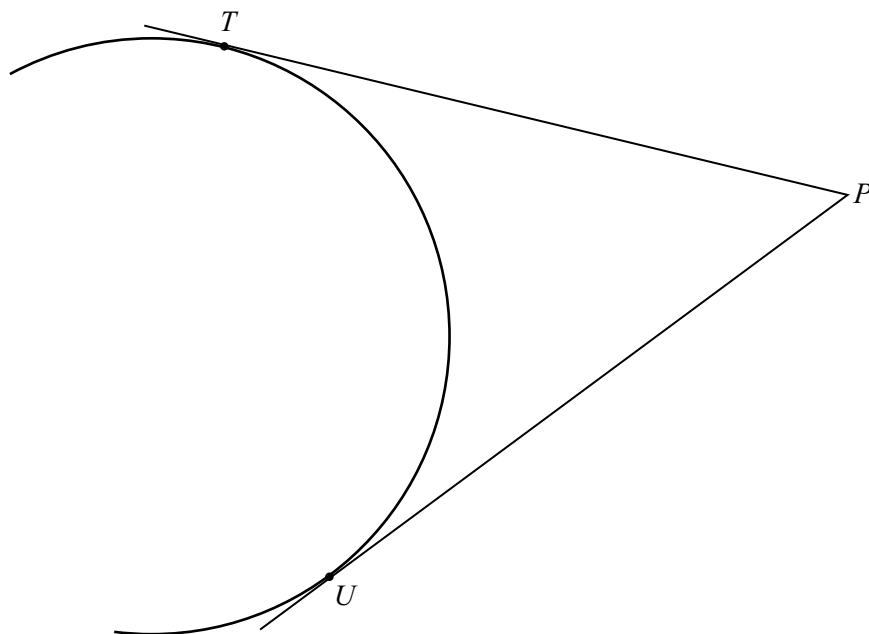
4



In this question show clearly all your construction arcs.

- (a) Using a straight edge and compasses only, construct on the diagram above,
- (i) the perpendicular bisector of BD , [2]
 - (ii) the bisector of angle CDA . [2]
- (b) Shade the region, inside the quadrilateral, which is nearer to D than B **and** nearer to DC than DA . [1]

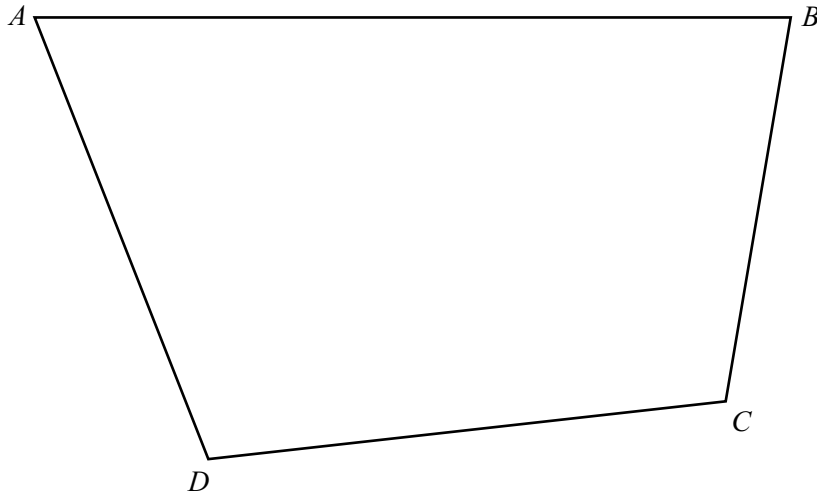
5



PT and PU are tangents to an arc of a circle at T and U .

- (a) Using a straight edge and compasses only, construct the bisector of angle TPU . [2]
- (b) By **drawing another line accurately**, find the centre of the circle and label it O . [2]

- 6 The diagram is a scale drawing of a field. The actual length of the side AB is 100 metres.

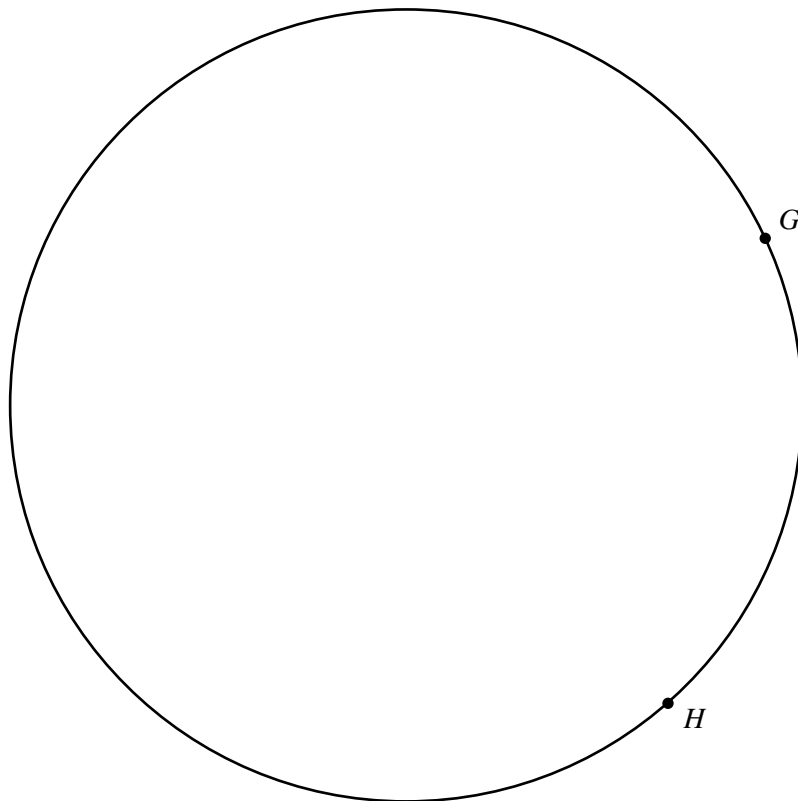


- (a) Write the scale of the drawing in the form $1 : n$, where n is an integer.

Answer (a) 1 : [1]

- (b) In this part use a straight edge and compasses only. Leave in your construction lines.
- (i) A tree in the field is equidistant from the point A and the point D . Construct the line on which the tree stands. [2]
- (ii) The tree is also equidistant from the sides BC and CD . After constructing another line, mark the position of the tree and label it T . [3]

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Find, by using **accurate** constructions, the region inside the circle which contains the points more than 5 cm from **G** and nearer to **H** than to **G**. Shade this region. [4]