

Geometry

Difficulty: Hard

Question Paper 2

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Geometry
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 2

Time allowed: 100 minutes

Score: /87

Percentage: /100

Grade Boundaries:

CIE IGCSE Maths (0580)

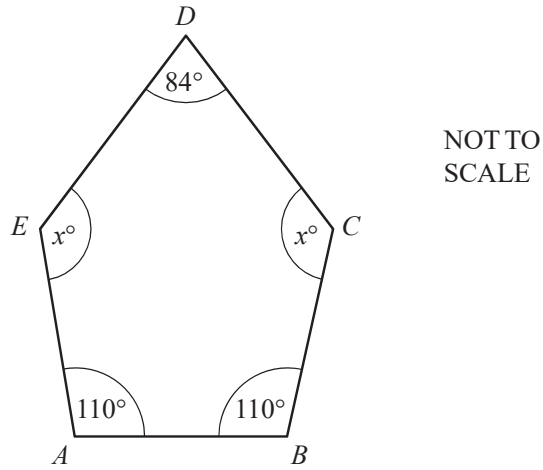
A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

Question 1

(a)



In the pentagon $ABCDE$, angle $EAB = \text{angle } ABC = 110^\circ$ and angle $CDE = 84^\circ$.
Angle $BCD = \text{angle } DEA = x^\circ$.

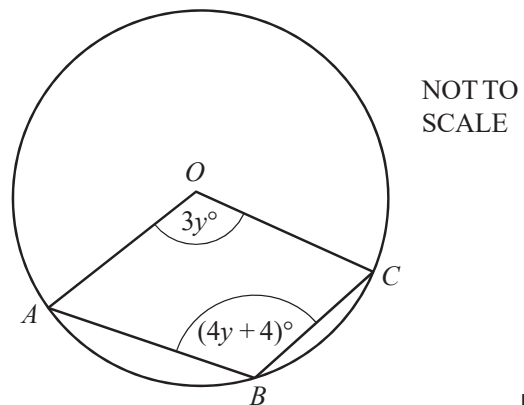
(i) Calculate the value of x . [2]

(ii) $BC = CD$.
Calculate angle CBD . [1]

(iii) This pentagon also has one line of symmetry.
Calculate angle ADB . [1]

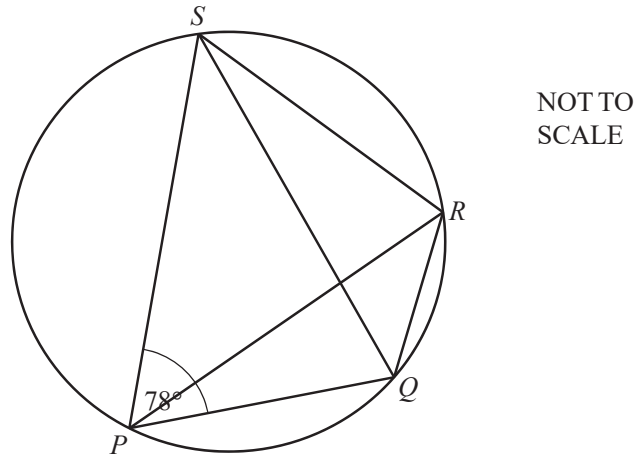
(b) A , B and C lie on a circle centre O .
Angle $AOC = 3y^\circ$ and angle $ABC = (4y + 4)^\circ$.

Find the value of y .



[4]

(c)



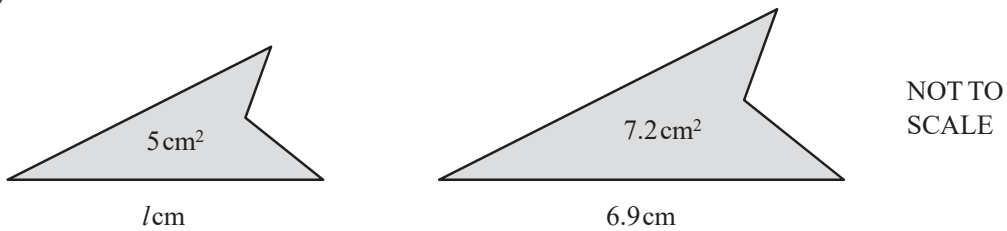
In the cyclic quadrilateral $PQRS$, angle $SPQ = 78^\circ$.

(i) Write down the geometrical reason why angle $QRS = 102^\circ$. [1]

(ii) Angle PRQ : Angle $PRS = 1 : 2$.

Calculate angle PQS . [3]

(d)

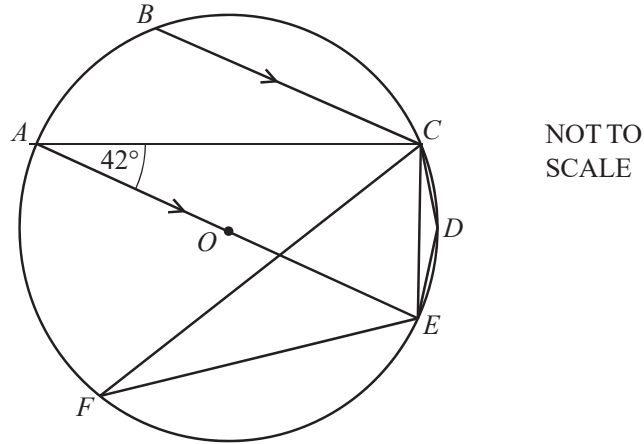


The diagram shows two similar figures.
The areas of the figures are 5 cm^2 and 7.2 cm^2 .
The lengths of the bases are $l \text{ cm}$ and 6.9 cm .

Calculate the value of l . [3]

Question 2

(a)



A, B, C, D, E and F are points on the circumference of a circle centre O .
 AE is a diameter of the circle.
 BC is parallel to AE and angle $CAE = 42^\circ$.

Giving a reason for each answer, find

(i) angle BCA ,

[2]

(ii) angle ACE ,

[2]

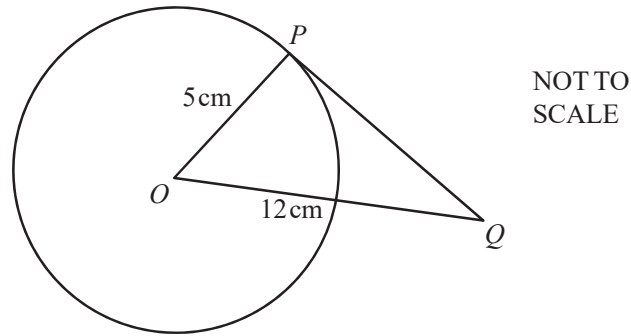
(iii) angle CFE ,

[2]

(iv) angle CDE .

[2]

(b)

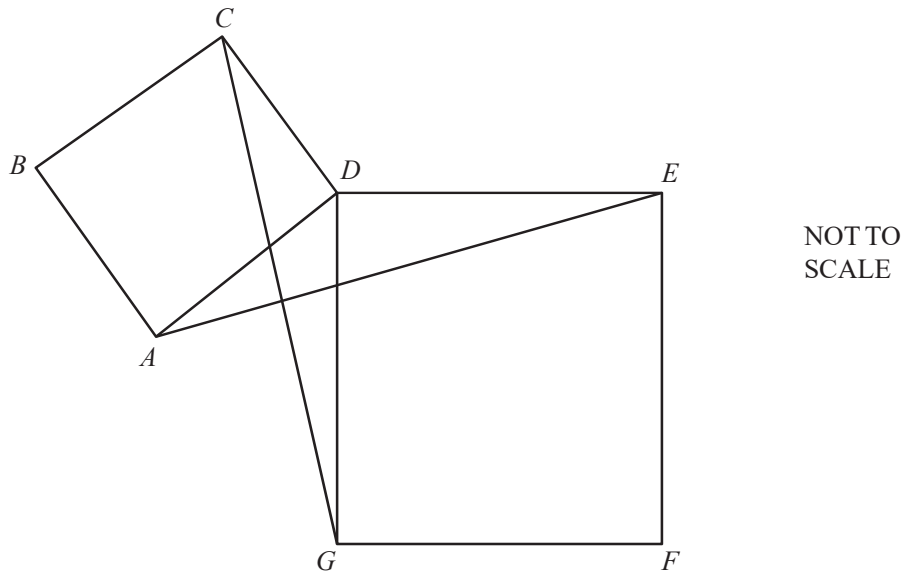


In the diagram, O is the centre of the circle and PQ is a tangent to the circle at P .
 $OP = 5$ cm and $OQ = 12$ cm.

Calculate PQ .

[3]

(c)



In the diagram, $ABCD$ and $DEFG$ are squares.

(i) In the triangles CDG and ADE , explain with a reason which sides and/or angles are equal.

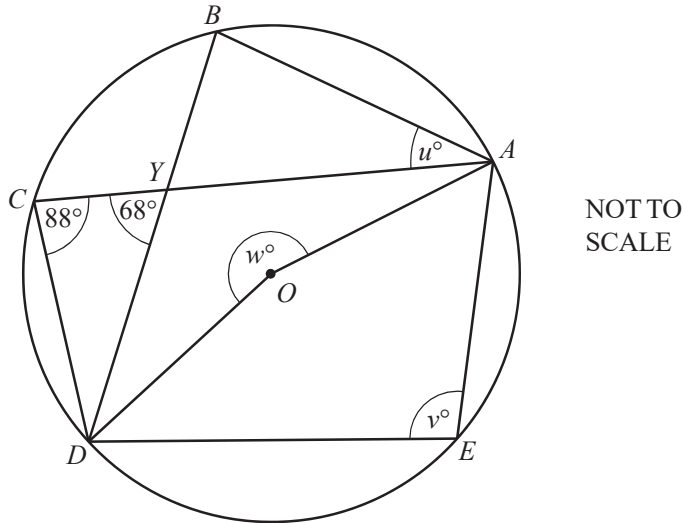
[3]

(ii) Complete the following statement.

[1]

Question 3

(a)

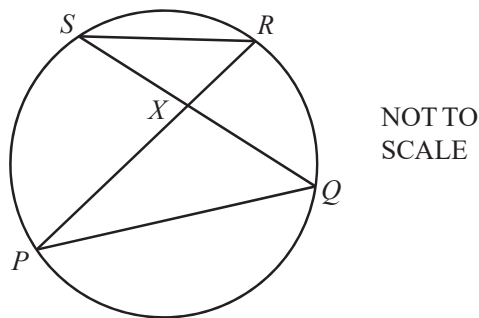


A, B, C, D and E lie on the circle, centre O .
 CA and BD intersect at Y .
 Angle $DCA = 88^\circ$ and angle $CYD = 68^\circ$.
 Angle $BAC = u^\circ$, angle $AED = v^\circ$ and reflex angle $AOD = w^\circ$.

[4]

Calculate the values of u , v and w .

(b)

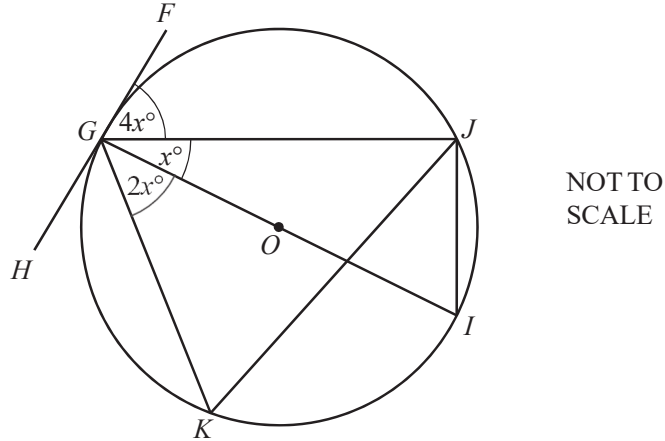


P, Q, R and S lie on the circle. PR and QS intersect at X .
 The area of triangle $RSX = 1.2 \text{ cm}^2$ and $PX = 3 SX$.

Calculate the area of triangle PQX .

[2]

(c)



GI is a diameter of the circle.
 FGH is a tangent to the circle at G .
 J and K also lie on the circle.
 Angle $JGI = x^\circ$, angle $FGJ = 4x^\circ$ and angle $KGI = 2x^\circ$.

Find

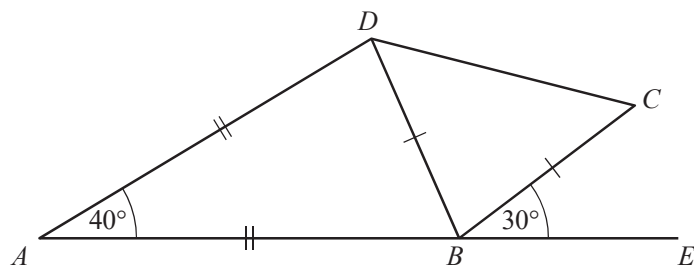
(i) the value of x , [2]

(ii) the size of angle JKG , [2]

(iii) the size of angle GJK . [1]

Question 4

(a)



NOT TO
SCALE

$ABCD$ is a quadrilateral with angle $BAD = 40^\circ$.

AB is extended to E and angle $EBC = 30^\circ$.

$AB = AD$ and $BD = BC$.

(i) Calculate angle BCD .

[3]

(ii) Give a reason why DC is not parallel to AE .

[1]

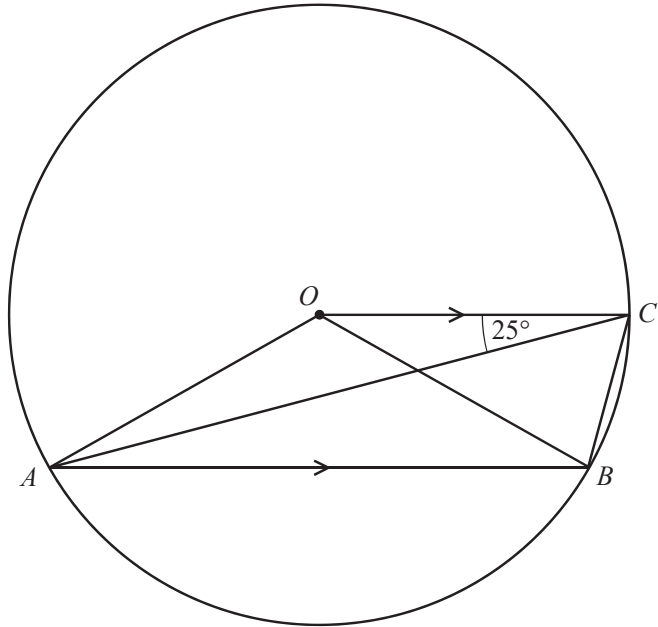
(b) A regular polygon has n sides.

Each exterior angle is $\frac{5n}{2}$ degrees.

Find the value of n .

[3]

(c)



NOT TO
SCALE

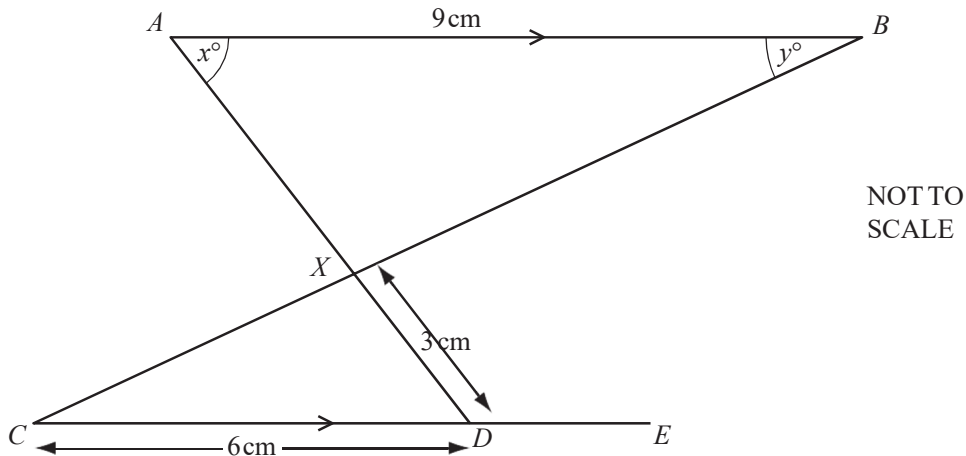
The diagram shows a circle centre O .
 A , B and C are points on the circumference.
 OC is parallel to AB .
 Angle $OCA = 25^\circ$.

Calculate angle OBC .

[3]

Question 5

(a)



The lines AB and CDE are parallel.
 AD and CB intersect at X .
 $AB = 9$ cm, $CD = 6$ cm and $DX = 3$ cm.

(i) Complete the following statement.

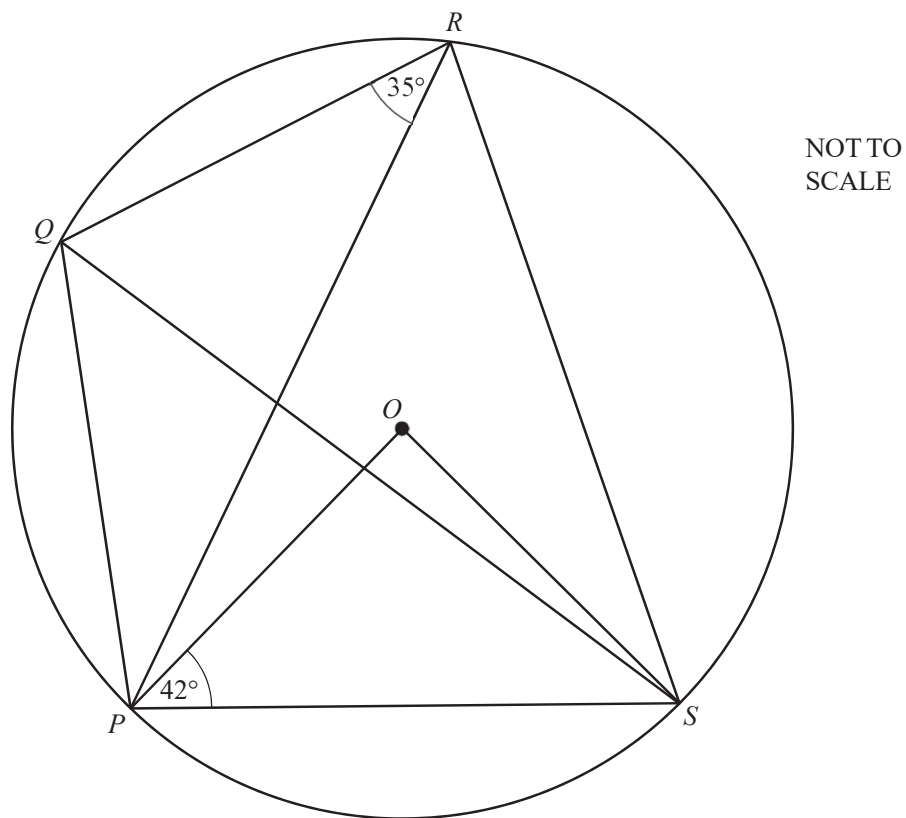
Triangle ABX is to triangle DCX . [1]

(ii) Calculate the length of AX . [2]

(iii) The area of triangle DCX is 6 cm^2 .
 Calculate the area of triangle ABX . [2]

(iv) Angle $BAX = x^\circ$ and angle $ABX = y^\circ$.
 Find angle AXB and angle XDE in terms of x and/or y . [2]

(b)



P, Q, R and S lie on a circle, centre O .
 Angle $OPS = 42^\circ$ and angle $PRQ = 35^\circ$.

Calculate

(i) angle POS , [1]

(ii) angle PRS , [1]

(iii) angle SPQ , [1]

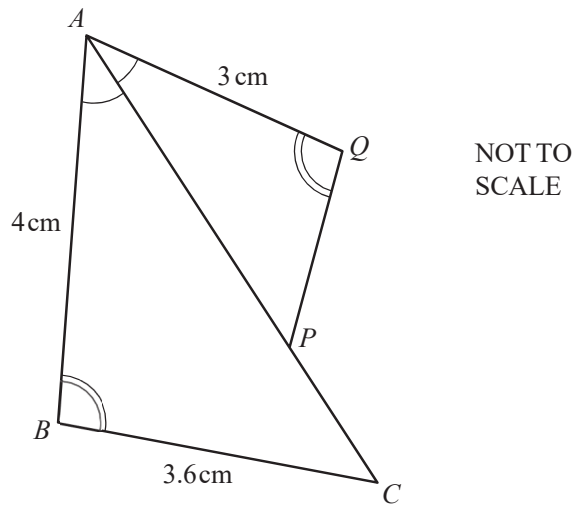
(iv) angle PSQ . [1]

(c) The interior angle of a regular polygon is 8 times as large as the exterior angle.

Calculate the number of sides of the polygon. [3]

Question 6

(a)



The diagram shows two triangles ACB and APQ .

Angle $PAQ =$ angle BAC and angle $AQP =$ angle ABC .

$AB = 4$ cm, $BC = 3.6$ cm and $AQ = 3$ cm.

(i) Complete the following statement.

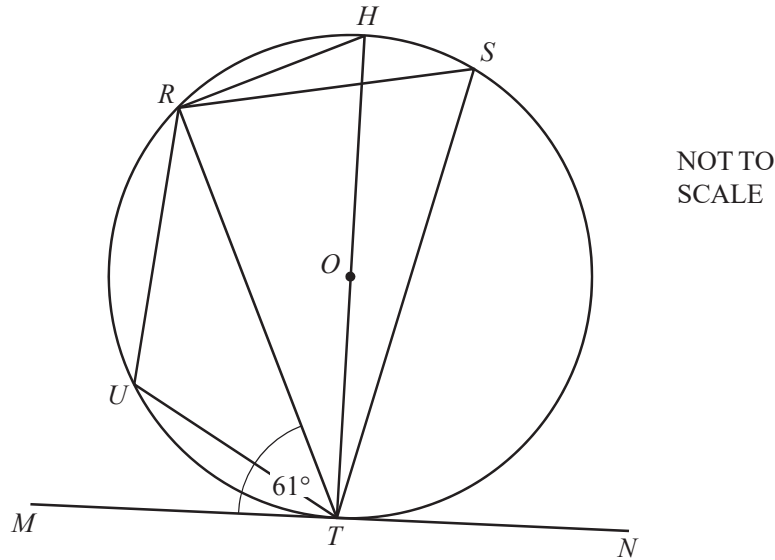
Triangle ACB is to triangle APQ . [1]

(ii) Calculate the length of PQ . [2]

(iii) The area of triangle ACB is 5.6 cm^2 .

Calculate the area of triangle APQ . [2]

(b)



R, H, S, T and U lie on a circle, centre O .
 HT is a diameter and MN is a tangent to the circle at T .
 Angle $RTM = 61^\circ$.

Find

(i) angle RTH , [1]

(ii) angle RHT , [1]

(iii) angle RST , [1]

(iv) angle RUT . [1]

(c) $ABCDEF$ is a hexagon.

The interior angle B is 4° greater than interior angle A .

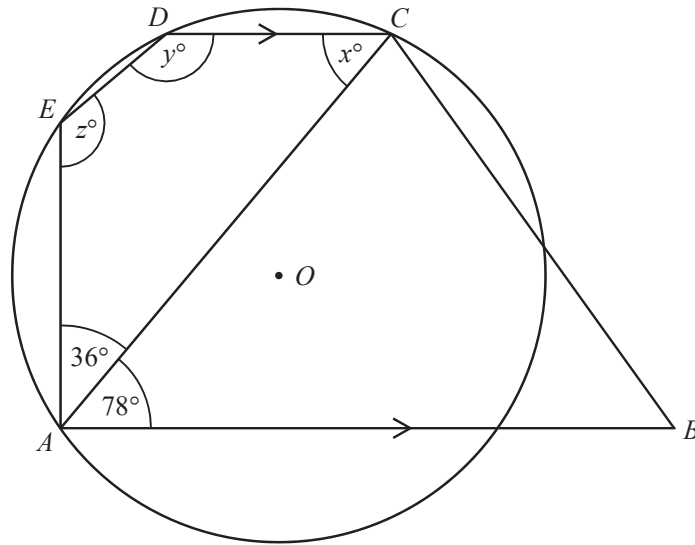
The interior angle C is 4° greater than interior angle B , and so on, with each of the next interior angles 4° greater than the previous one.

(i) By how many degrees is interior angle F greater than interior angle A ? [1]

(ii) Calculate interior angle A . [3]

Question 7

NOT TO SCALE



$ABCDE$ is a pentagon.

A circle, centre O , passes through the points A , C , D and E .

Angle $EAC = 36^\circ$, angle $CAB = 78^\circ$ and AB is parallel to DC .

(a) Find the values of x , y and z , giving a reason for each.

[6]

(b) Explain why ED is **not** parallel to AC .

[1]

(c) Find the value of angle EOC .

[1]

(d) $AB = AC$.

Find the value of angle ABC .

[1]