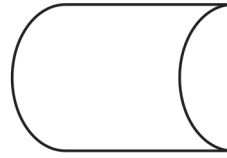
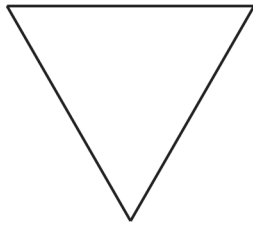


1

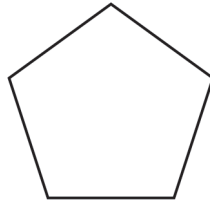


On each shape draw all the lines of symmetry.

[3]

[Total: 3]

2



Write down the order of rotational symmetry of this regular pentagon.

..... [1]

[Total: 1]

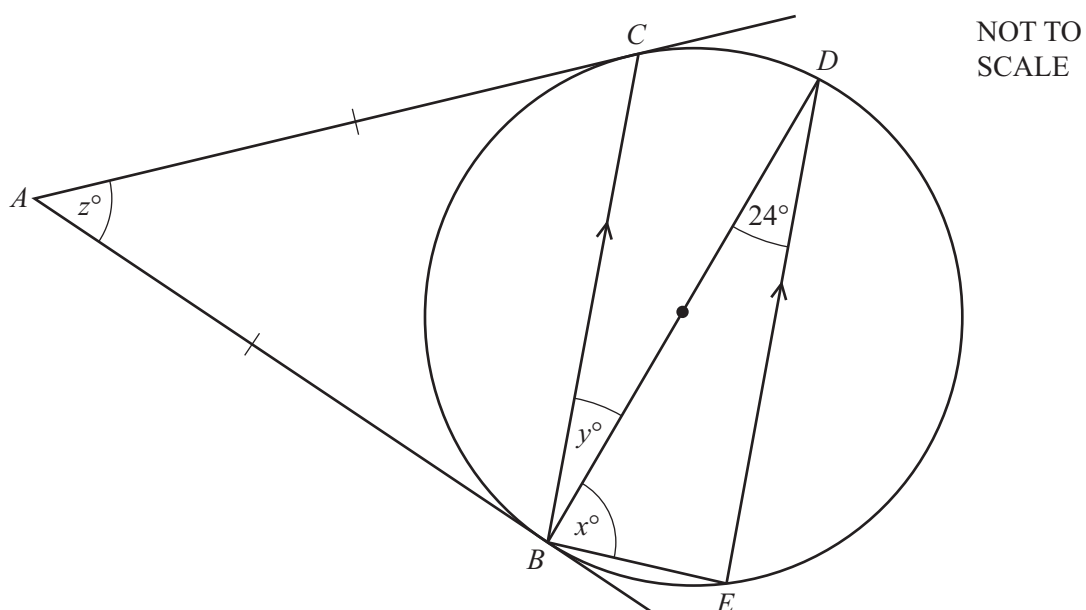
3 Each exterior angle of a regular polygon is  $30^\circ$ .

Work out the number of sides the polygon has.

*Answer* ..... [2]

[Total: 2]

4



The points  $B$ ,  $C$ ,  $D$  and  $E$  lie on a circle.  
 $AB$  and  $AC$  are equal length tangents to the circle.  
 $BD$  is a diameter of the circle and  $BC$  is parallel to  $ED$ .  
 Angle  $BDE = 24^\circ$ .

Calculate the value of

(a)  $x$ ,

Answer(a)  $x = \dots\dots\dots$  [2]

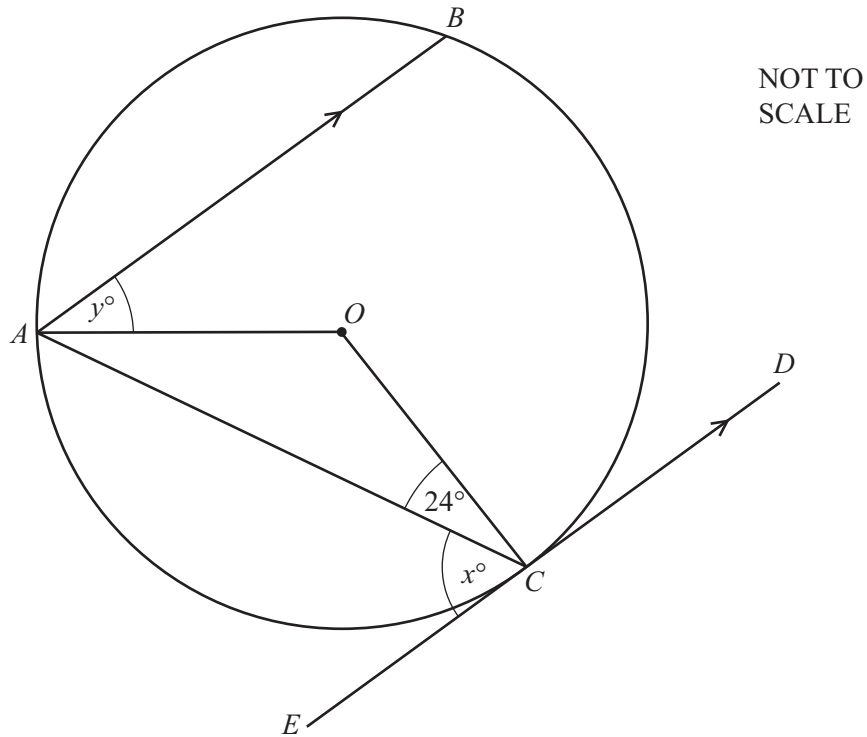
(b)  $y$ ,

Answer(b)  $y = \dots\dots\dots$  [1]

(c)  $z$ .

Answer(c)  $z = \dots\dots\dots$  [2]

[Total: 5]



The diagram shows a circle with centre  $O$ .  
 $ED$  is a tangent to the circle at  $C$ .  
 $AB$  is parallel to  $ED$  and angle  $ACO = 24^\circ$ .

Find the value of

(a)  $x$ ,

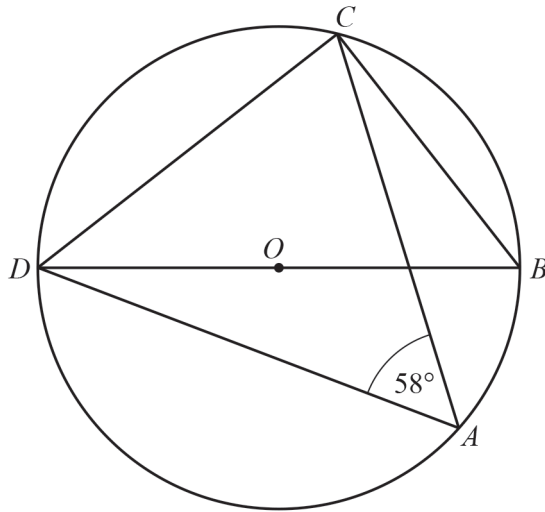
Answer(a)  $x = \dots\dots\dots$  [1]

(b)  $y$ .

Answer(b)  $y = \dots\dots\dots$  [2]

[Total: 3]

6

NOT TO  
SCALE

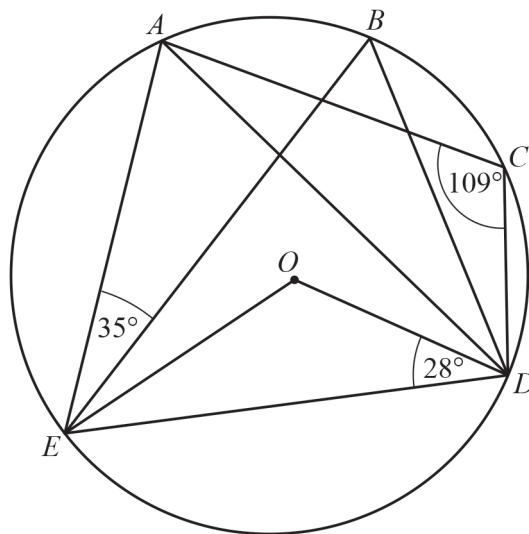
$A, B, C$  and  $D$  are points on the circumference of the circle, centre  $O$ .  
 $DOB$  is a straight line and angle  $DAC = 58^\circ$ .

Find angle  $CDB$ .

Angle  $CDB = \dots\dots\dots$  [3]

[Total: 3]

7

NOT TO  
SCALE

$A, B, C, D$  and  $E$  lie on the circle, centre  $O$ .  
 Angle  $AEB = 35^\circ$ , angle  $ODE = 28^\circ$  and angle  $ACD = 109^\circ$ .

(a) Work out the following angles, giving reasons for your answers.

(i) Angle  $EBD = \dots\dots\dots$  because  $\dots\dots\dots$

$\dots\dots\dots$

$\dots\dots\dots$  [3]

(ii) Angle  $EAD = \dots\dots\dots$  because  $\dots\dots\dots$

$\dots\dots\dots$

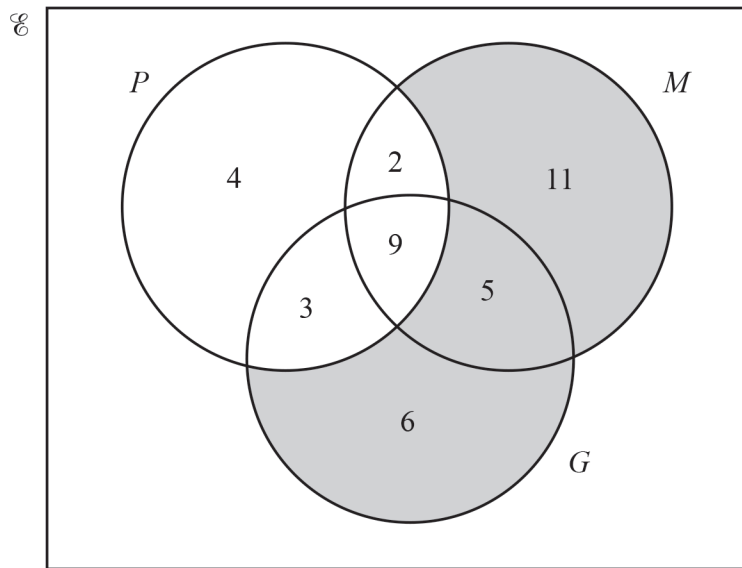
[2]

(b) Work out angle  $BEO$ .

Angle  $BEO = \dots\dots\dots$  [3]

[Total: 8]

- 8 The Venn diagram shows the number of students in a class of 40 who study physics ( $P$ ), mathematics ( $M$ ) and geography ( $G$ ).



- (a) Use set notation to describe the shaded region.

..... [1]

- (b) Find  $n((P \cap G) \cup M')$ .

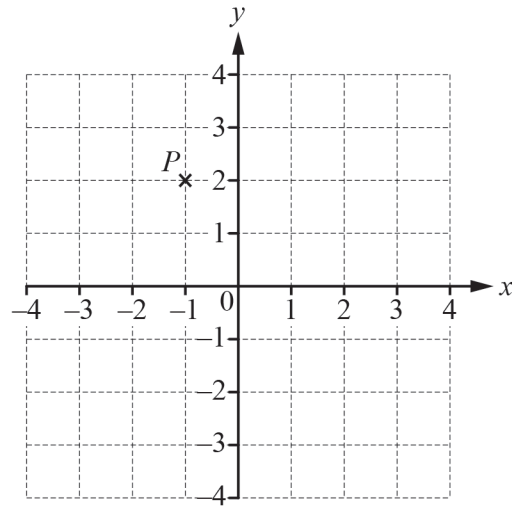
..... [1]

- (c) A student is chosen at random from those studying geography.

Find the probability that this student also studies physics or mathematics but not both.

..... [2]

[Total: 4]



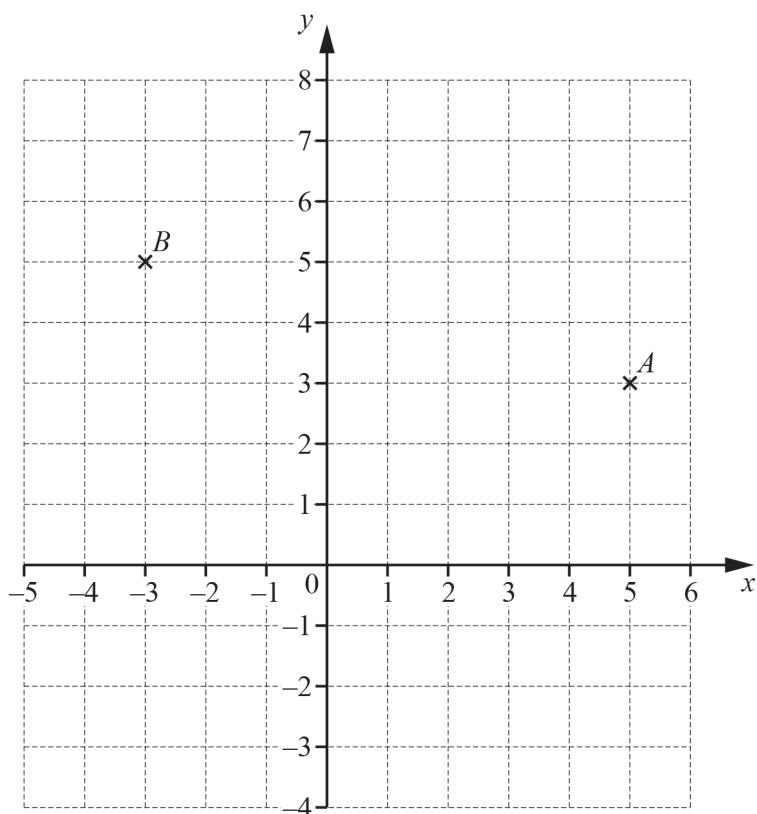
- 9  $P$  is the point  $(-1, 2)$  and  $\overrightarrow{PQ} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$ .

Find the co-ordinates of  $Q$ .

( ..... , ..... ) [1]

[Total: 1]

10



(a) Write down the co-ordinates of point A.

( ..... , ..... ) [1]

(b) Plot the point C at (4, -3).

[1]

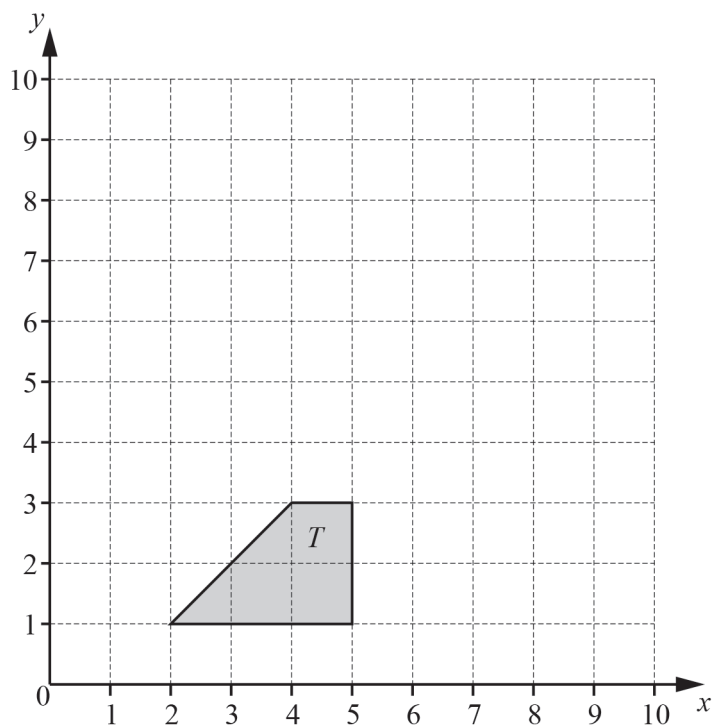
(c) Find the vector  $\overrightarrow{AB}$ .

$$\overrightarrow{AB} = \begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix} \quad [1]$$

[Total: 3]



11



- (a) Translate shape  $T$  by the vector  $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$ .

Label the image  $A$ .

[2]

- (b) Rotate shape  $T$  about the point  $(5, 3)$  through  $180^\circ$ .  
Label the image  $B$ .

[2]

- (c) Describe fully the **single** transformation that maps shape  $A$  onto shape  $B$ .

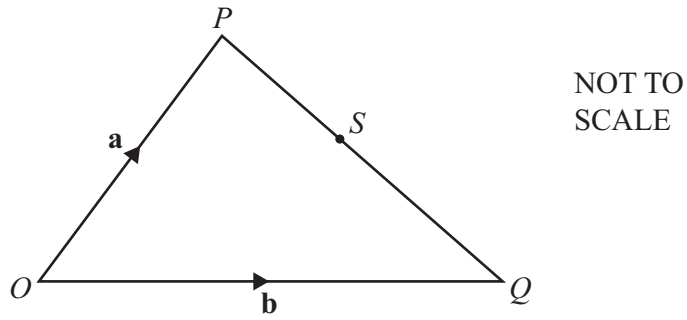
.....

.....

[3]

[Total: 7]

12



$S$  is a point on  $PQ$  such that  $PS : SQ = 4 : 5$ .

Find  $\overrightarrow{OS}$ , in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , in its simplest form.

$$\overrightarrow{OS} = \dots\dots\dots [2]$$

[Total: 2]