



**Answer all TWELVE questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** Gary buys furniture and sells it in a shop.

In the shop on Monday, Gary has tables and chairs such that

$$\text{number of tables} : \text{number of chairs} = 2 : 7$$

Gary has 42 chairs in the shop on Monday.

(a) Calculate the number of tables Gary has in the shop on Monday.

(2)

Gary buys a table for \$240 and sells it for \$276

(b) Calculate the percentage profit from the sale of the table.

(2)

Gary buys some chairs and sells them for \$513

Gary's percentage profit from the sale of the chairs is 35%

(c) Calculate the price at which Gary bought the chairs.

(2)

The cost of a table that Gary buys is \$732

An identical table costs 684 euros in France.

Using the exchange rate \$1 = 0.95 euros

(d) find the difference in the costs of the tables.

State whether your answer is in euros or \$.

(3)

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**Question 1 continued**

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Handwriting practice area with 25 horizontal dotted lines.

**(Total for Question 1 is 9 marks)**



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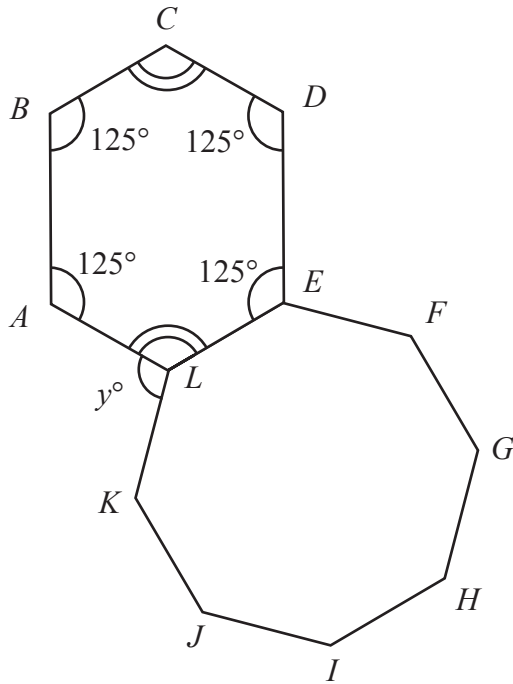


Diagram **NOT** accurately drawn

**Figure 1**

Figure 1 shows a hexagon  $ABCDEL$  and a regular octagon  $EFGHIJKL$

$$\angle BAL = \angle ABC = \angle CDE = \angle DEL = 125^\circ$$

$$\angle BCD = \angle ALE \quad \angle ALK = y^\circ$$

- (a) Calculate the value of  $y$  (5)

A different regular polygon has  $T$  sides and is such that

$$\text{an interior angle} = (10x + 25)^\circ \quad \text{an exterior angle} = (7x - 83)^\circ$$

- (b) Calculate the value of  $T$  (4)

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[Sum of interior angles of polygon =  $(2n - 4)$  right angles]



**Question 2 continued**

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Handwriting practice area with 25 horizontal dotted lines.

**(Total for Question 2 is 9 marks)**



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3 Triangle *A* and triangle *B* are drawn on the grid opposite.

- (a) Describe fully the single transformation that maps triangle *A* onto triangle *B* (3)

Triangle *A* is transformed to triangle *C* by a reflection in the line with equation  $y = -1$

- (b) On the grid, draw and label triangle *C* (2)

Triangle *A* is transformed to triangle *D* by an enlargement with centre  $(0, 3)$  and scale factor 2

- (c) On the grid, draw and label triangle *D* (2)

Triangle *A* is transformed to triangle *E* under the transformation with matrix **M** where

$$\mathbf{M} = \begin{pmatrix} -2 & 1 \\ 0 & -2 \end{pmatrix}$$

- (d) On the grid, draw and label triangle *E* (3)

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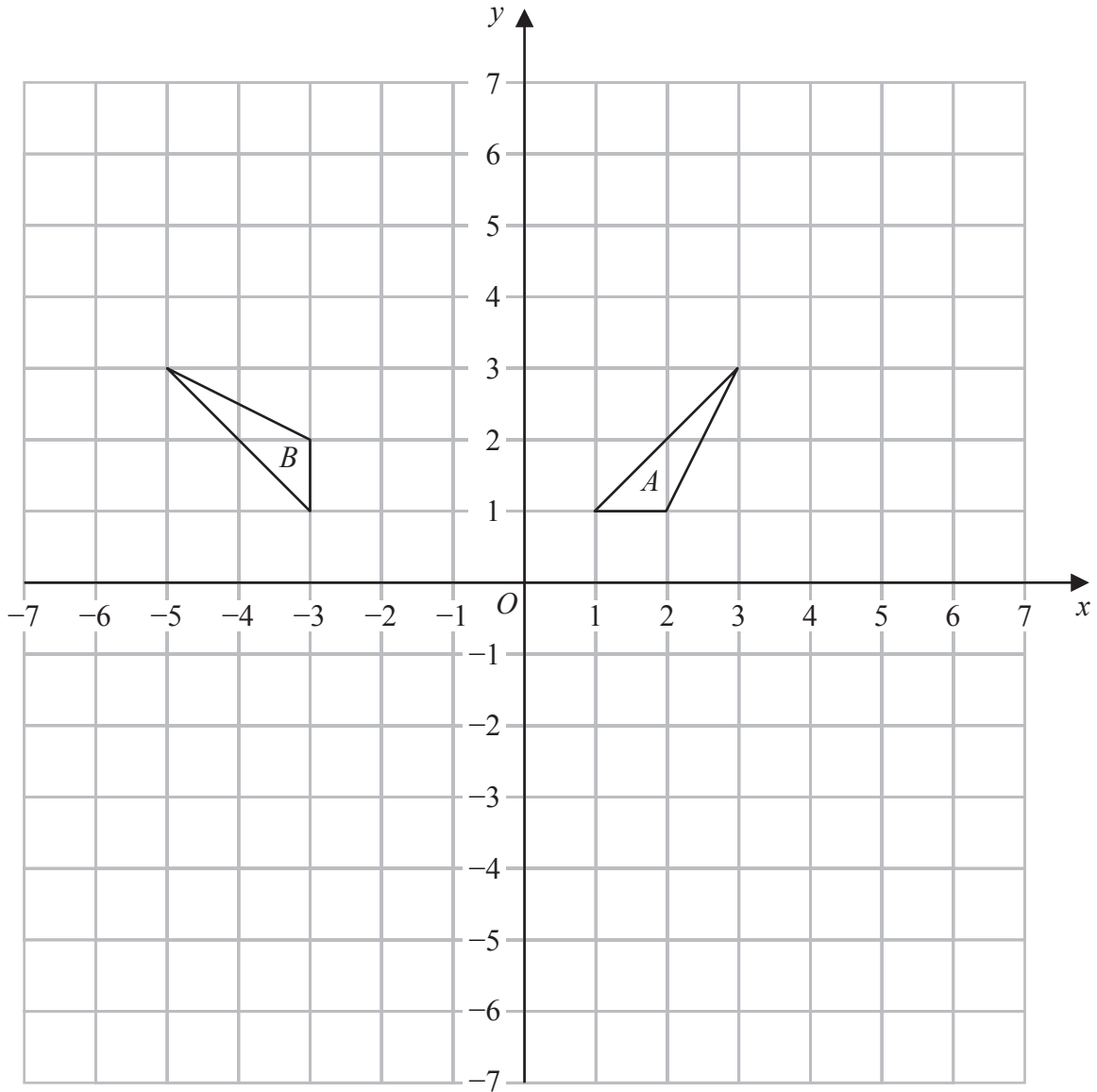
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Question 3 continued



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Turn over for a spare grid if you need to redraw your triangles.



**Question 3 continued**

Handwriting practice area consisting of 25 horizontal dotted lines.

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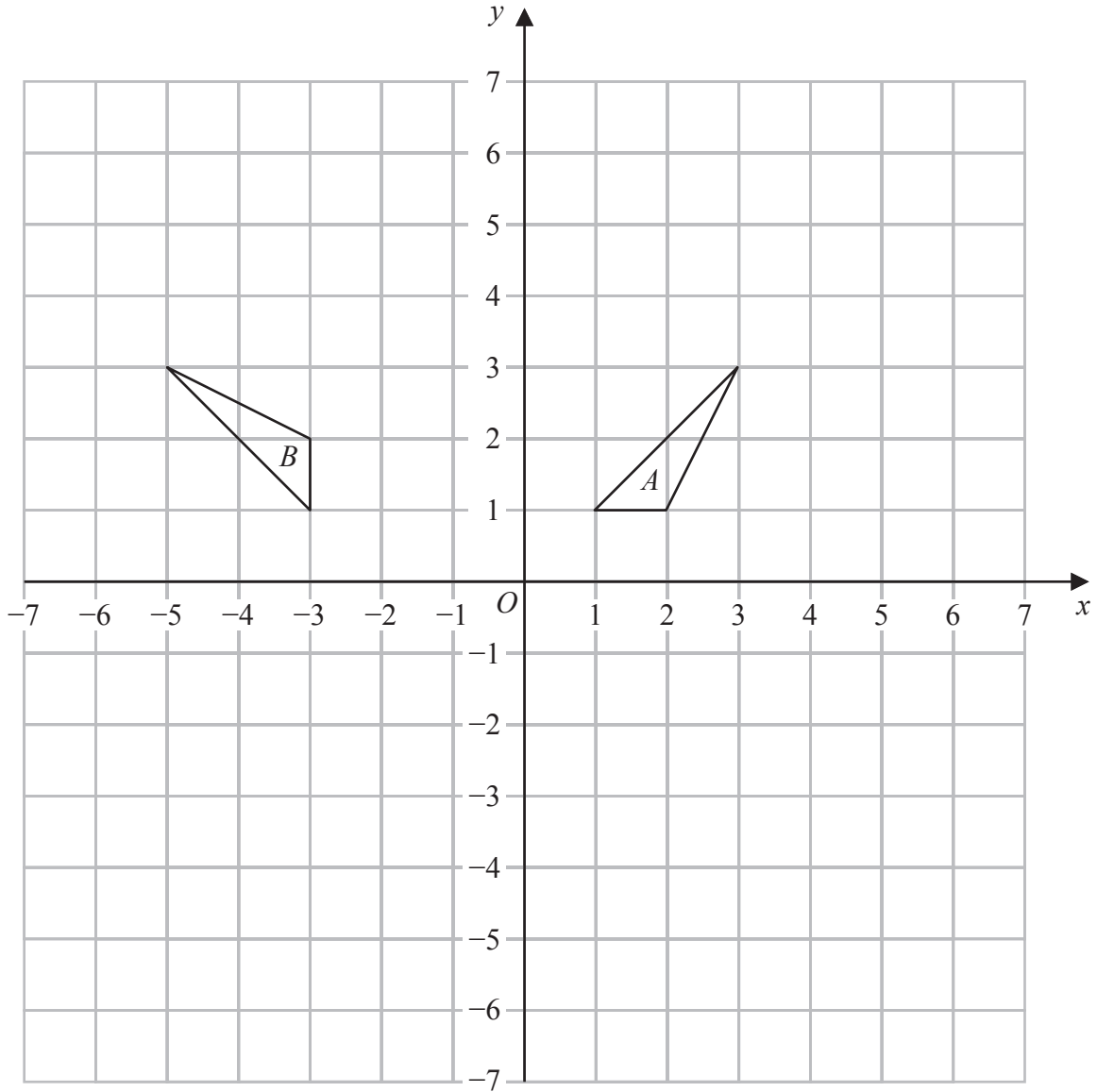
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Question 3 continued

Only use this grid if you need to redraw your triangles.



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(Total for Question 3 is 10 marks)

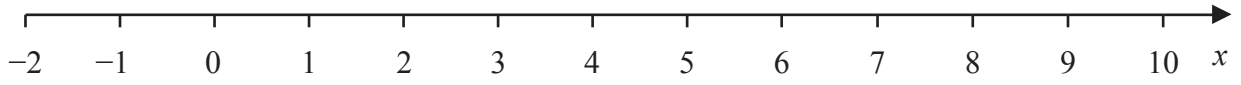


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Question 4 continued



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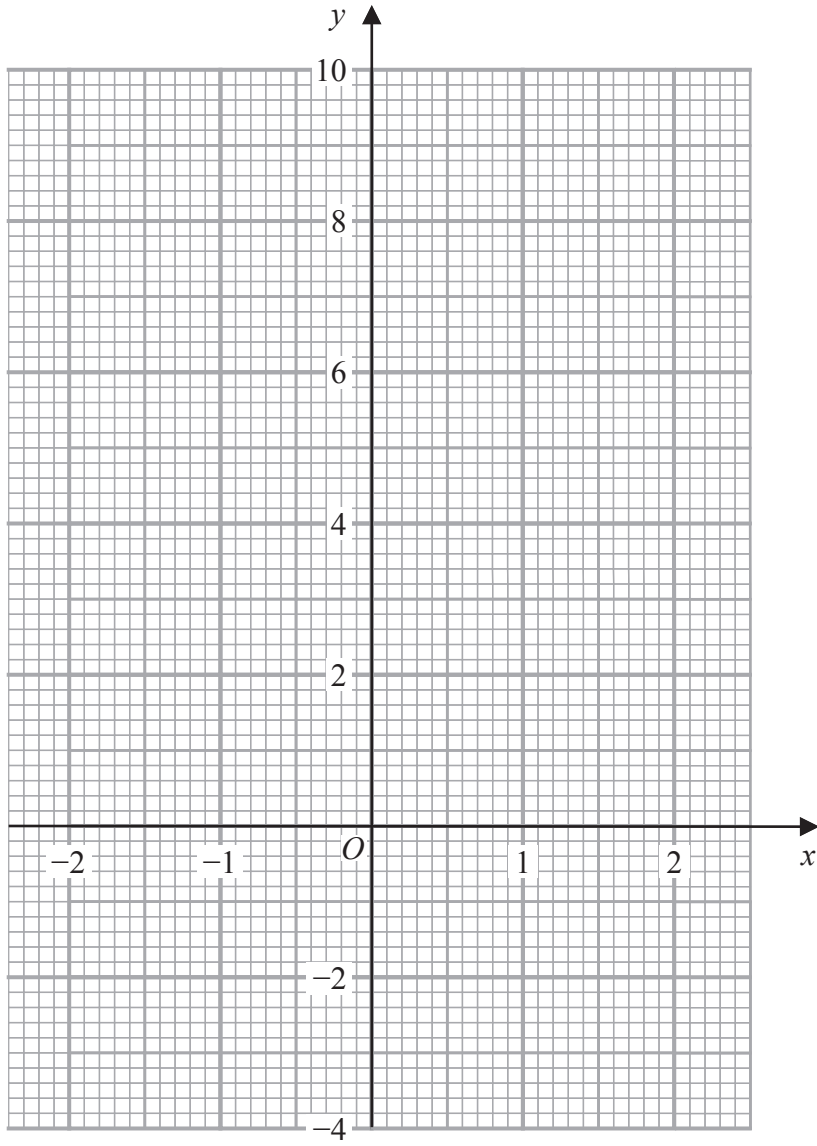
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(Total for Question 4 is 6 marks)





Question 5 continued



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(Total for Question 5 is 6 marks)

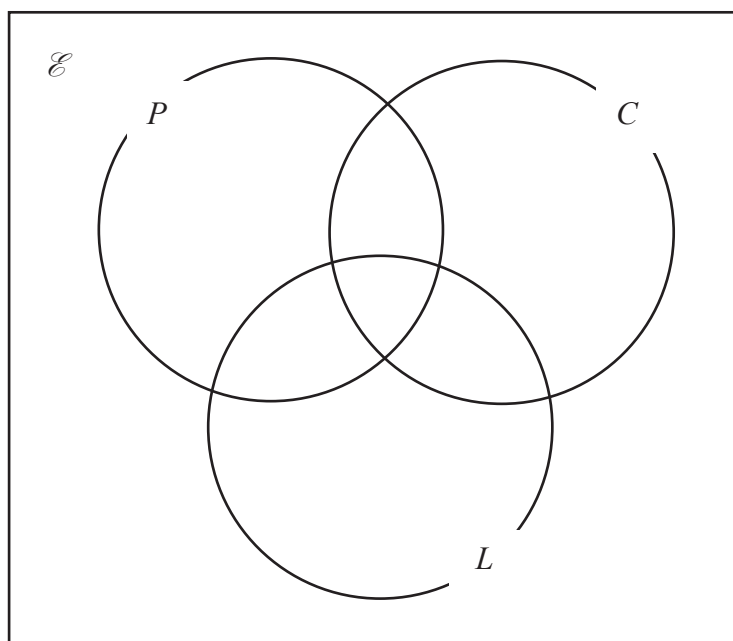


6 80 gardeners were asked if they grow potatoes ( $P$ ), carrots ( $C$ ) or lettuce ( $L$ )

Of these gardeners

- 9 grow potatoes, carrots and lettuce
- 17 grow potatoes and carrots
- 23 grow carrots and lettuce
- 19 grow potatoes and lettuce
- 48 grow carrots
- 49 grow lettuce
- 2 grow none of these three crops

(a) Using this information, complete the Venn diagram below to show the number of gardeners in each subset.



(3)

(b) Find  $n(C \cap L')$

(1)

One of the gardeners is chosen at random.

Given that this gardener grows carrots,

(c) find the probability that this gardener also grows lettuce.

(2)

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**Question 6 continued**

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Area with horizontal dotted lines for writing.

**(Total for Question 6 is 6 marks)**



$$7 \quad \mathbf{A} = \begin{pmatrix} 10 & -6 \\ -8 & 5 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} -15 & 10 \\ 14 & -5 \end{pmatrix} \quad \mathbf{C} = \begin{pmatrix} 1 & -3 & 1 \\ 2 & -4 & -2 \end{pmatrix}$$

(a) Find  $4\mathbf{A} + 2\mathbf{B}$

(2)

(b) Find  $\mathbf{AC}$

(3)

(c) Find the matrix  $\mathbf{D}$  such that  $\mathbf{A}^{-1} + \mathbf{D} = 2\mathbf{I}$  where  $\mathbf{I} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

(4)

[The inverse of matrix  $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$  is  $\frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$ ]



**Question 7 continued**

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Area with horizontal dotted lines for writing.

**(Total for Question 7 is 9 marks)**



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8 Aalia delivers letters and parcels.

- (a) Last week Aalia worked for 5 days and wrote down 5 integers that represent the distance, in miles, she drove each day.

For these integers

the mode is 15  
 the median is 16  
 the largest – the smallest = 7

Find 5 integers that Aalia could have written down.

(3)

- (b) Aalia has 8 letters to deliver to Tom.  
 The mean weight of the 8 letters is 104 grams.

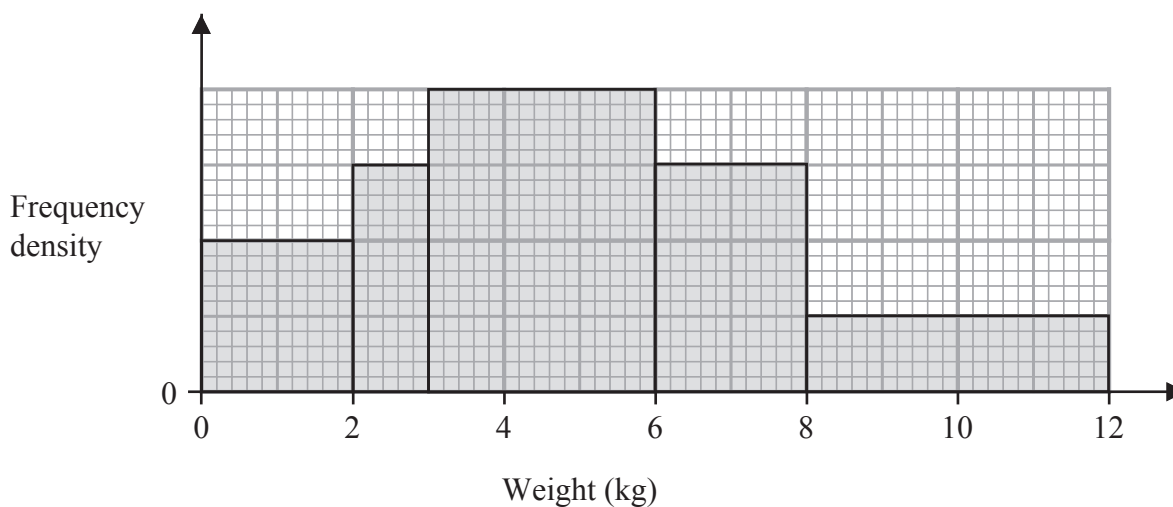
5 of the letters are each of weight 89 grams.

The mean weight of the remaining letters is  $A$  grams.

Work out the value of  $A$

(3)

The histogram shows information about the weights of all the parcels Aalia has in her delivery van on Friday.



75 of the parcels in the van each have a weight between 2 kg and 6 kg.

Aalia takes 2 parcels at random from the van.

- (c) Find an estimate for the probability that both parcels weigh more than 4 kg.

(5)

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**Question 8 continued**

Handwriting practice area with 25 horizontal dotted lines.

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**Question 8 continued**

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Area with horizontal dotted lines for writing.

**(Total for Question 8 is 11 marks)**



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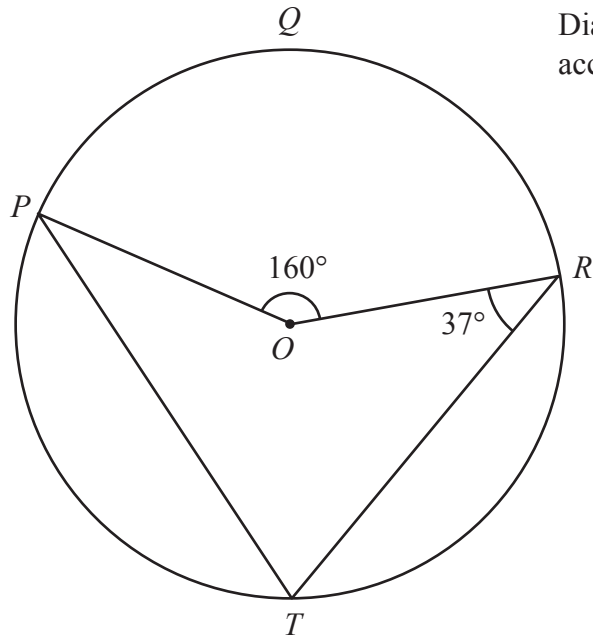


Diagram **NOT** accurately drawn

**Figure 2**

Figure 2 shows the points  $P$ ,  $Q$ ,  $R$  and  $T$  on a circle centre  $O$

$$\angle POR = 160^\circ \quad \angle ORT = 37^\circ$$

- (a) (i) Work out the size, in degrees, of  $\angle PTR$  (1)
- (ii) Give a reason for your answer. (1)
- (b) Work out the size, in degrees, of  $\angle TPO$  (2)

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Question 9 continued

Handwriting practice area with 25 horizontal dotted lines.

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**Question 9 continued**

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Area with horizontal dotted lines for writing.

**(Total for Question 9 is 10 marks)**



P 7 3 4 9 7 A 0 2 5 3 2



**Question 10 continued**

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Area with horizontal dotted lines for writing.



Question 10 continued

Handwriting practice area with 25 horizontal dotted lines.

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**Question 10 continued**

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Area with horizontal dotted lines for writing.

**(Total for Question 10 is 14 marks)**



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**Question 11 continued**

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Handwriting practice area with 20 horizontal dotted lines.

**(Total for Question 11 is 6 marks)**

**Turn over for Question 12**



