

POINT7TM

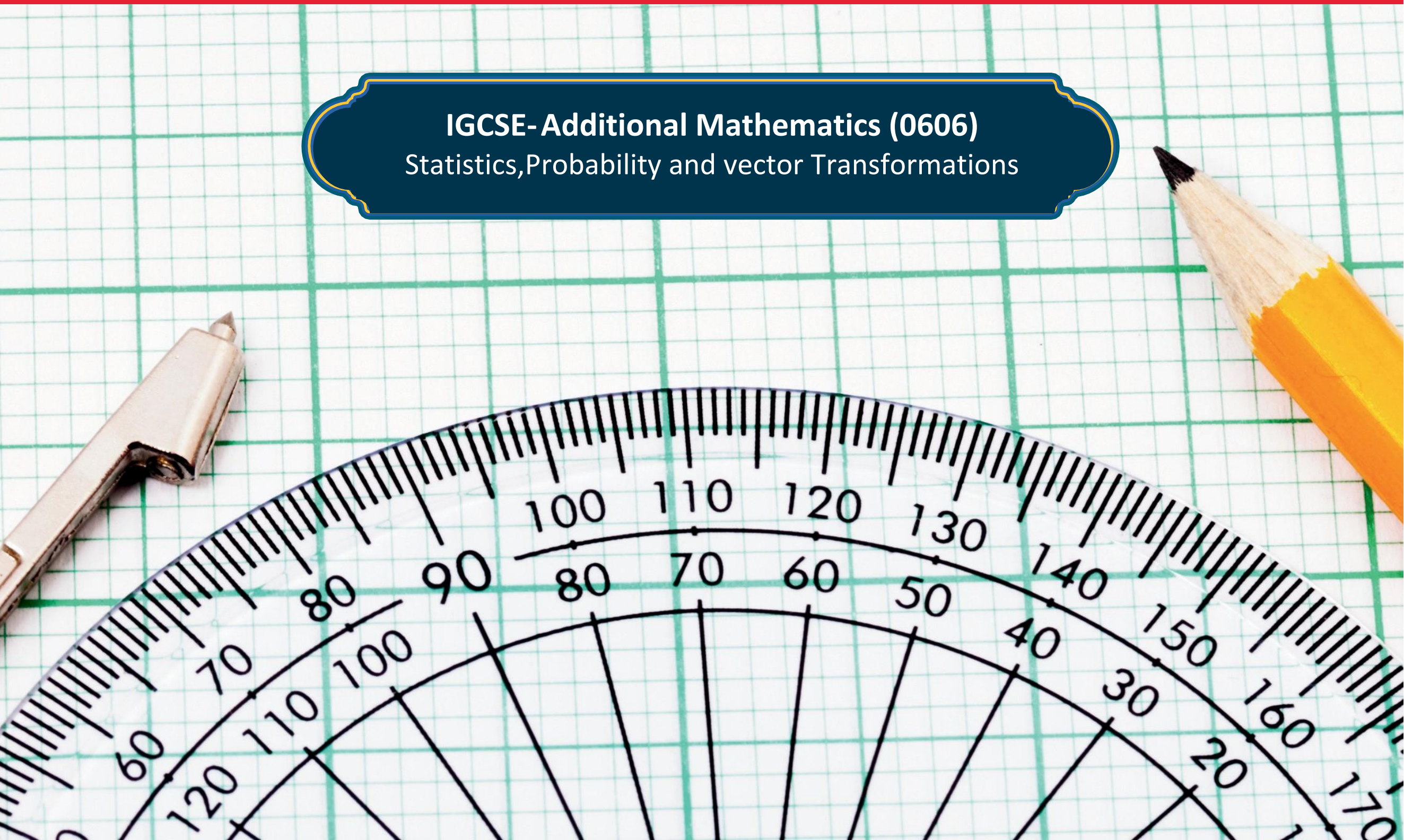
Your International Curriculum Expert

ELEVATE

MATH TOPICAL WORKSHEETS

IGCSE- Additional Mathematics (0606)

Statistics, Probability and vector Transformations



- 1 Sushila, has a bag which contains 10 red balls and 8 blue balls. Sushila takes one ball at random from her bag.

Find the probability that she takes a red ball.

(1 mark)

- 2 A bag contains 4 red marbles and 2 yellow marbles.
Behnaz picks two marbles at random without replacement.

Find the probability that

i) the marbles are both red,

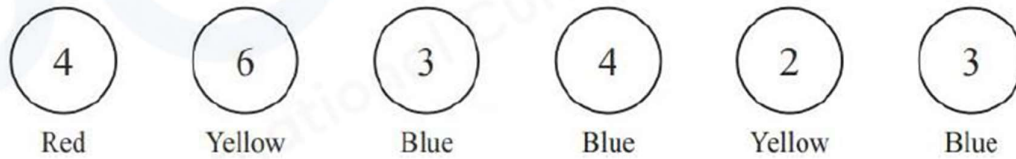
[2]

ii) the marbles are not both red.

[1]

(3 marks)

3



The diagram shows six discs. Each disc has a colour and a number.

Two of the six discs are picked at random **without** replacement. Find the probability that

i) both discs have the number 3,

[2]

ii) both discs have the same colour.

[3]

- 4 A factory recycles metal.

The mass, x tonnes, of metal is measured each week.

The table shows the results for 52 weeks.

Mass (x tonnes)	$100 < x \leq 200$	$200 < x \leq 250$	$250 < x \leq 300$	$300 < x \leq 500$
Frequency	8	20	12	12

Calculate an estimate of the mean.

..... tonnes

(4 marks)

5 Given that $a < b < c$ the four whole numbers a, a, b and c have

a mode of 7 a median of 8.5 a mean of 9

Work out the value of a , the value of b and the value of c .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

$c = \dots\dots\dots$

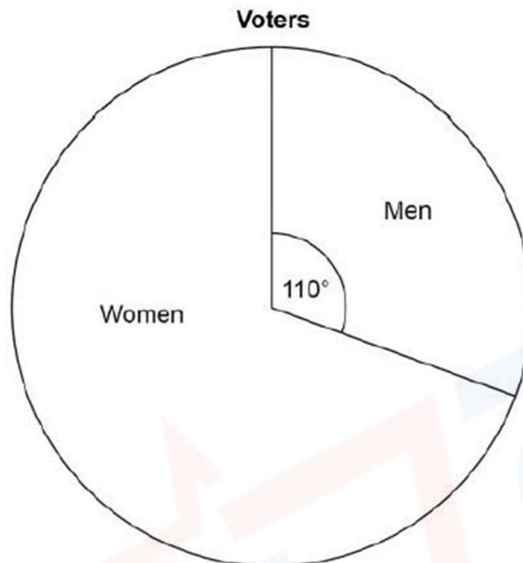
- 6 Some students each record the mass, m kg, of their school bag.

Adil wants to draw a histogram to show this information. Complete the table below.

Mass (m kg)	$0 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 7$	$7 < m \leq 10$
Frequency	32			42
Height of bar on histogram (cm)	1.6	2	1.2	2.8

(2 marks)

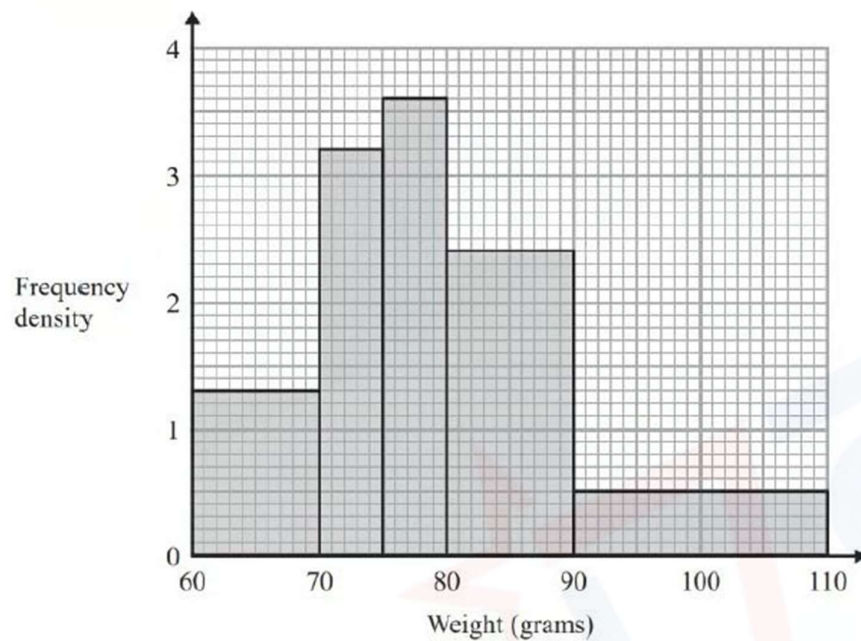
7 The pie chart shows information about voters in an election.



3360 **more** women voted than men. Work out the total number of voters.

(3 marks)

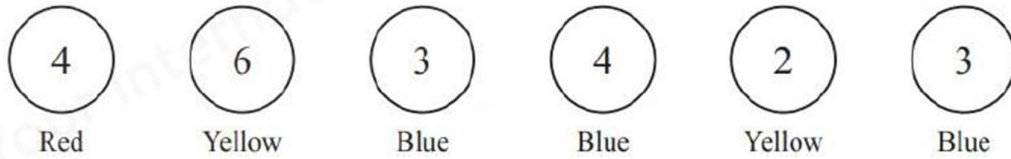
- 8 The histogram shows information about the weights, in grams, of some plums.



Work out an estimate for the proportion of these plums with a weight of less than 100 grams.

(3 marks)

9



The diagram shows six discs. Each disc has a colour and a number.

Two of the six discs are picked at random **with** replacement.

Find the probability that both discs have the same colour.

- 10 (a)** 100 students were each asked how much money, \$ m , they spent in one week. The frequency table shows the results.

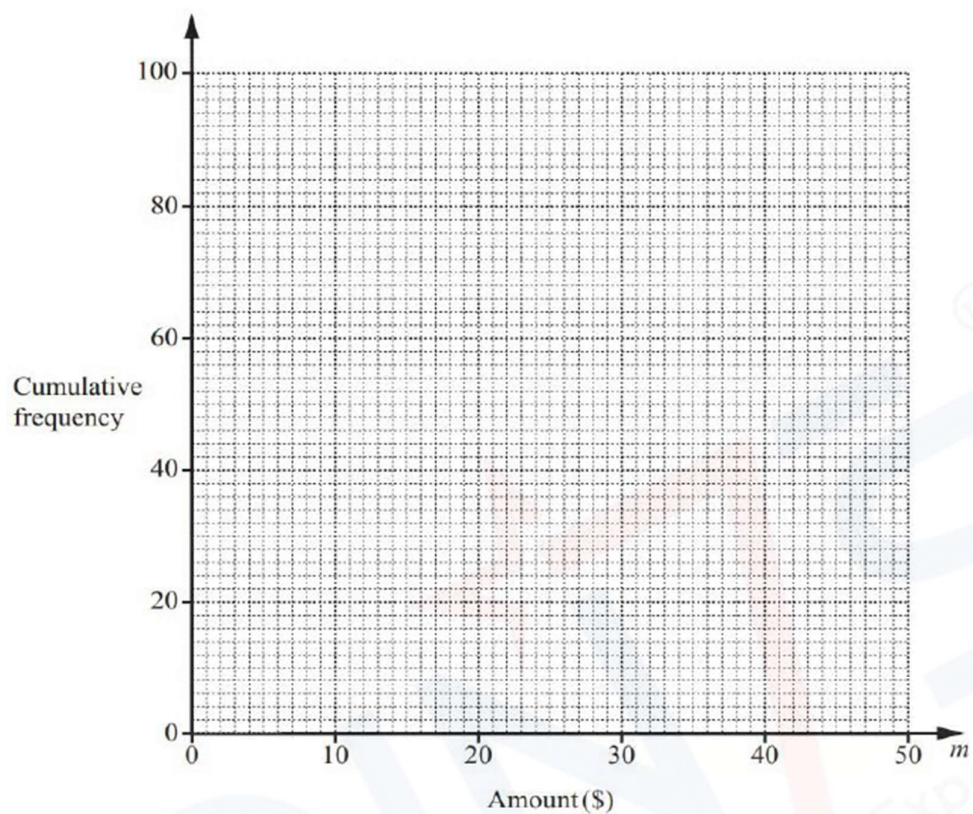
Amount (\$ m)	$0 < m \leq 5$	$5 < m \leq 10$	$10 < m \leq 20$	$20 < m \leq 30$	$30 < m \leq 50$
Frequency	16	38	30	9	7

Complete the cumulative frequency table below.

Amount (\$ m)	$m \leq 5$	$m \leq 10$	$m \leq 20$	$m \leq 30$	$m \leq 50$
Cumulative Frequency	16				100

(2 marks)

(b) On the grid, draw the cumulative frequency diagram.



(3 marks)

(c) Use your cumulative frequency diagram to find an estimate for

i) the median,

\$..... [1]

ii) the interquartile range,

\$..... [2]

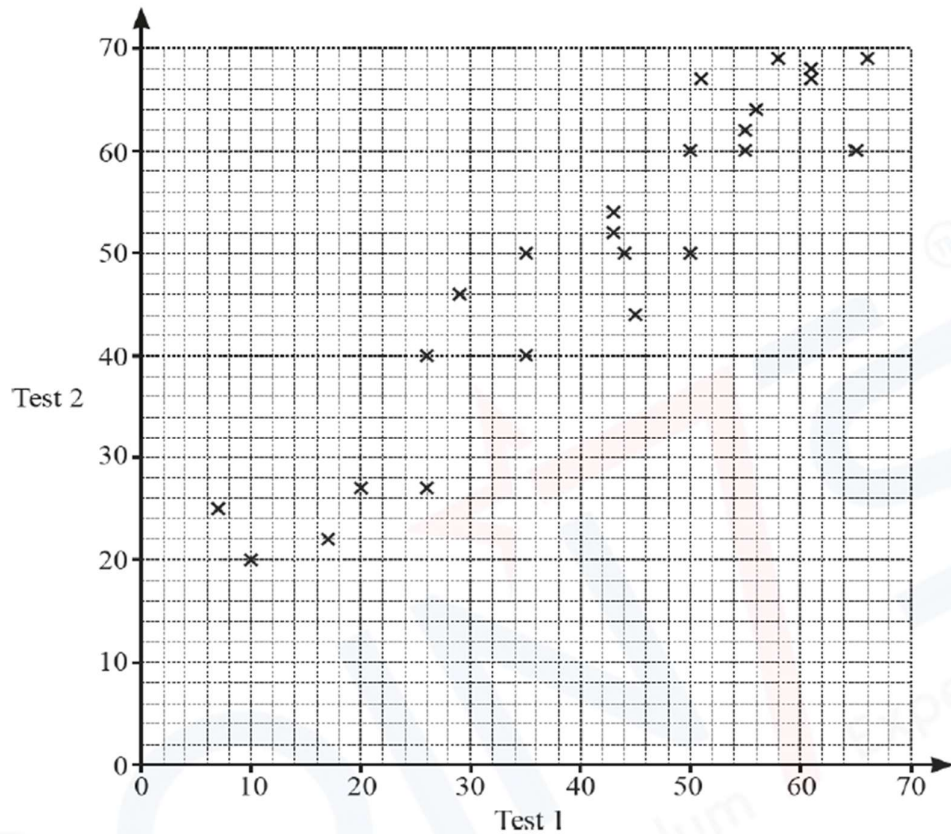
iii) the number of students who spent more than \$25.

[2]

(5 marks)

11 (a) Mrs Salaman gives her class two mathematics tests.

The scatter diagram shows information about the marks each student scored.



Write down the highest mark scored on test 1.

(1 mark)

(b) Write down the type of correlation shown in the scatter diagram.

(1 mark)

(c) Draw a line of best fit on the scatter diagram.

(1 mark)

(d) Hamish scored a mark of 40 on test 1. He was absent for test 2. Use your line of best fit to find an estimate for his mark on test 2.

(1 mark)

12

A line joins $A(1, 3)$ to $B(5, 8)$.

The line AB is transformed to the line PQ .

Find the co-ordinates of P and the co-ordinates of Q after AB is transformed by

i) a rotation through 90° anticlockwise about the origin,

$P(\dots\dots\dots, \dots\dots\dots)$

$Q(\dots\dots\dots, \dots\dots\dots)$ [2]

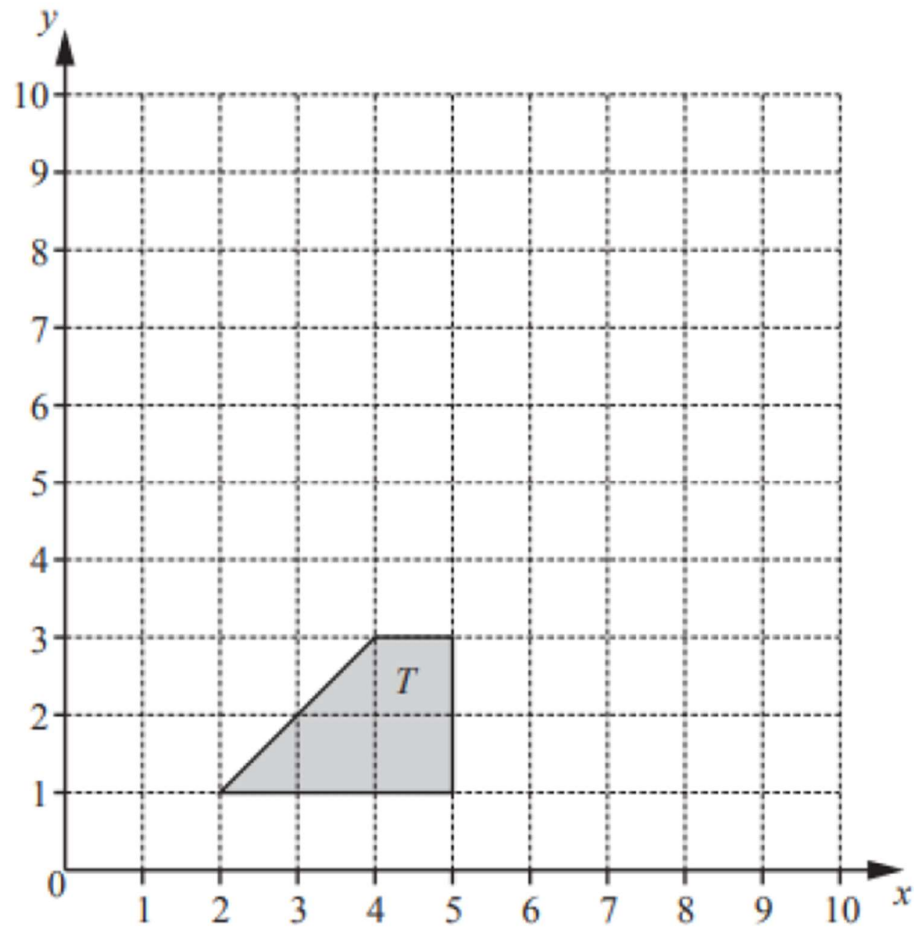
ii) a reflection in the line $x = 2$,

$P(\dots\dots\dots, \dots\dots\dots)$

$Q(\dots\dots\dots, \dots\dots\dots)$ [2]

(4 marks)

13



- i) Translate shape T by the vector $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$. Label the image A .

[2]

- ii) Rotate shape T about the point $(5, 3)$ through 180° . Label the image B .

[2]

- iii) Describe fully the **single** transformation that maps shape A onto shape B .

[3]

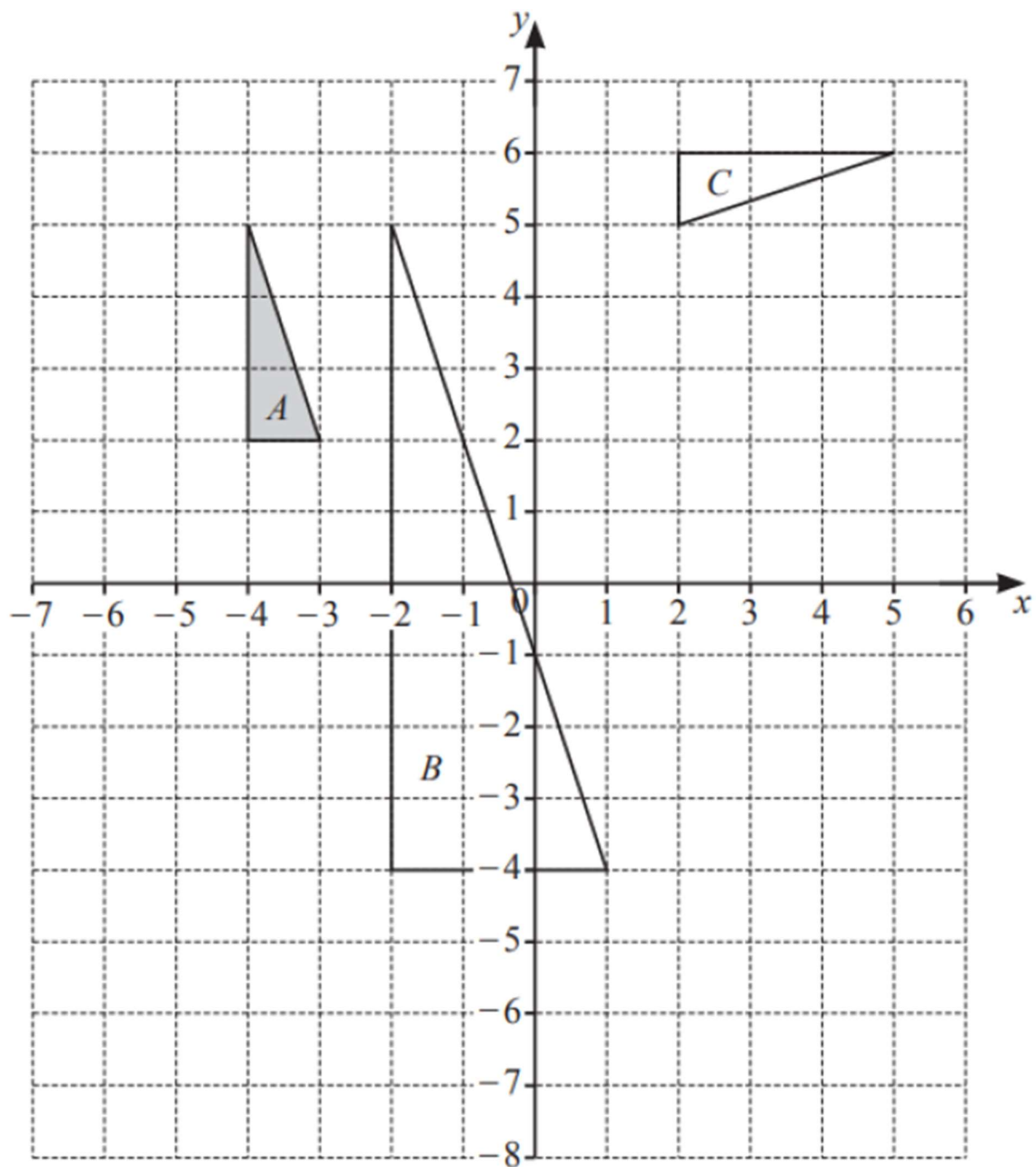
14

$$\overrightarrow{MT} = \begin{pmatrix} 2k \\ -k \end{pmatrix} \text{ and } |\overrightarrow{MT}| = \sqrt{180}.$$

Find the positive value of k .

$k = \dots\dots\dots$

15



Describe fully the **single** transformation that maps

i) shape A onto shape B ,

[3]

ii) Describe fully the **single** transformation that maps shape A onto shape C .

[3]

16

$$\mathbf{a} = \begin{pmatrix} -3 \\ 2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 5 \\ 4 \end{pmatrix} \quad \mathbf{c} = \begin{pmatrix} 14 \\ 9 \end{pmatrix}$$

$$m\mathbf{a} + n\mathbf{b} = \mathbf{c}$$

Write down two simultaneous equations and solve them to find the value of m and the value of n . Show all your working.

$$m = \dots\dots\dots$$

$$n = \dots\dots\dots$$

(5 marks)