Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

* 4 9 4 2 7 8 3 2 1 9 *

MATHEMATICS **0580/32**

Paper 3 (Core) **May/June 2014**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
Geometrical instruments

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 104.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages.

1 **(a)** Here is a list of numbers.

2 4 5 8 9 12

Write down **all** the numbers from this list which are

(i) odd,

Answer(a)(i) ..... [1]

(ii) square,

Answer(a)(ii) ..... [1]

(iii) cube,

Answer(a)(iii) ..... [1]

(iv) prime.

Answer(a)(iv) ..... [1]

(b) Write one of these symbols $>$, $<$ or $=$ to make each statement true.

π ..... $\frac{22}{7}$

$(\sqrt{2})^2$ 2

$\frac{1}{1+1}$ 2

$(-1)^2$ ..... -1

[2]

(c) Put one pair of brackets in each statement to make it true.

(i) 16 + 8 ÷ 4 – 2 = 4 [1]

(ii) 16 + 8 ÷ 4 – 2 = 20 [1]

(d) (i) Write 84 as a product of its prime factors.

Answer(d)(i) ..... [2]

(ii) Find the highest common factor of 84 and 24.

Answer(d)(ii) ..... [2]

(iii) Find the lowest common multiple of 84 and 24.

Answer(d)(iii) ..... [2]

(e) Here are the first four terms of a sequence.

3 7 11 15

(i) Write down the next term in this sequence.

Answer(e)(i) ..... [1]

(ii) Explain how you found your answer.

Answer(e)(ii) ..... [1]

(iii) Write down an expression for the nth term of this sequence.

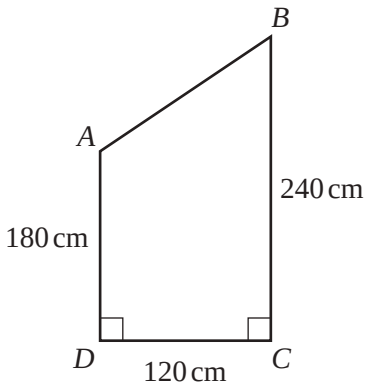
Answer(e)(iii) ..... [2]

(iv) Explain why 125 is not in this sequence.

Answer(e)(iv) .....

..... [1]

2



NOT TO SCALE

The diagram shows the cross section *ABCD* of a shed.
AD = 180 cm, *DC* = 120 cm and *BC* = 240 cm.

(a) (i) Write down the mathematical name of the cross section *ABCD*.

Answer(a)(i) ..... [1]

(ii) Calculate the area of the cross section *ABCD*.
Give the units of your answer.

Answer(a)(ii) .... [3]

(iii) The shed is a prism of length 2.5 **metres**.

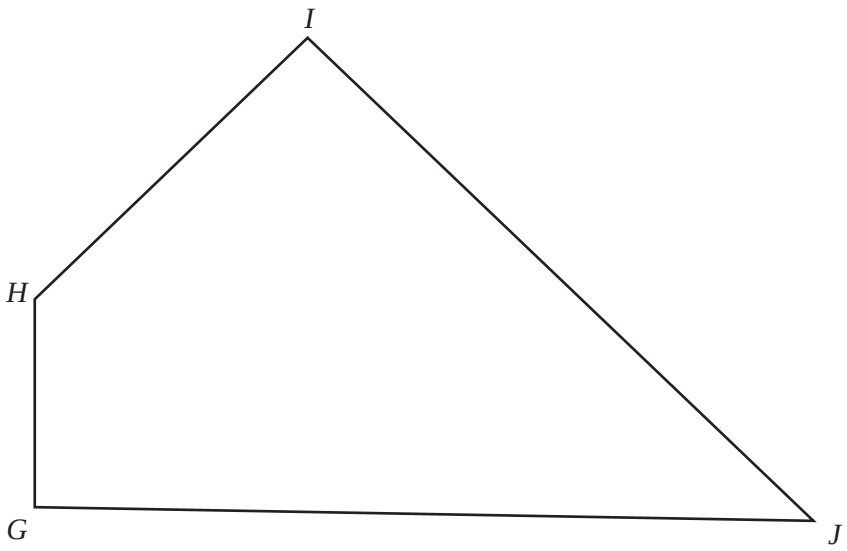
Calculate the volume of the shed.
Give your answer in cubic metres.

Answer(a)(iii) ..... m^3 [2]

(iv) Calculate the length *AB*.

Answer(a)(iv) *AB* = ... cm [3]

(b) Here is a scale drawing of a garden, *GHIJ*.
The scale is 1 centimetre represents 5 metres.



Scale: 1 cm to 5 m

The shed is placed in the garden so that it is

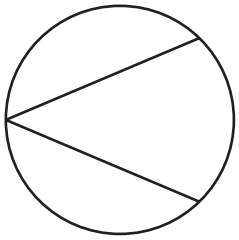
- nearer to *GJ* than to *IJ*

and

- within 20 m of *H*.

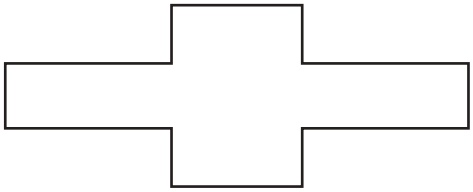
Using a ruler and compasses only, construct and shade the region where the shed can be placed.
Show all your construction arcs. [5]

3 **(a)** Draw the line of symmetry on the shape below.



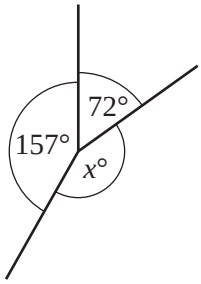
[1]

(b) Write down the order of rotational symmetry of the shape below.



Answer(b) ..... [1]

(c) **(i)**

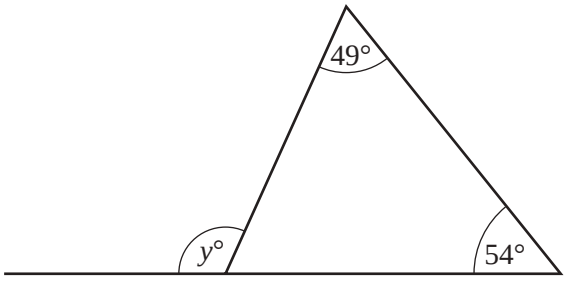


NOT TO SCALE

Work out the value of x.

Answer(c)(i) x = ... [1]

(ii)

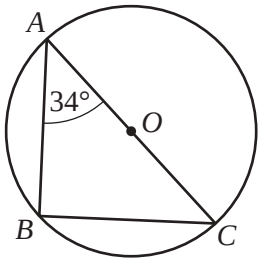


NOT TO SCALE

Work out the value of y.

Answer(c)(ii) y = ... [2]

(d)



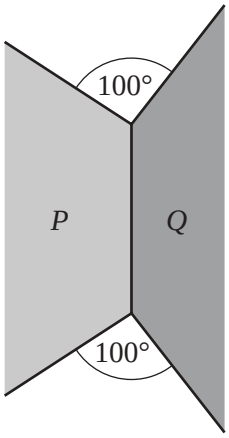
NOT TO SCALE

AC is a diameter of the circle, centre *O*.

Calculate angle *ACB*.

Answer(d) Angle *ACB* = ... [2]

(e) The diagram below shows parts of shape *P* and shape *Q*.
Shape *P* is a regular hexagon and shape *Q* is another regular polygon.
The two shapes have one side in common.

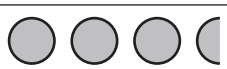


NOT TO SCALE

Find the number of sides in shape *Q*.
Show each step of your working.

Answer(e) ..... [5]

4 Paolo's football team played 46 games.
The pictogram shows some information about the number of goals scored by Paolo's football team.
They did not score any goals in five games.

Number of goals	Number of games
0	
1	
2	
3	
4	
5	
6	

Key:  = ... games

(a) (i) Complete the key. [1]

(ii) Paolo's team scored 2 goals in each of nine games.

Complete the pictogram. [1]

(b) (i) Write down the modal number of goals.

Answer(b)(i) ..... [1]

(ii) Find the median number of goals.

Answer(b)(ii) ..... [1]

(iii) Find the range.

Answer(b)(iii) ..... [1]

(iv) One of the 46 games is chosen at random.

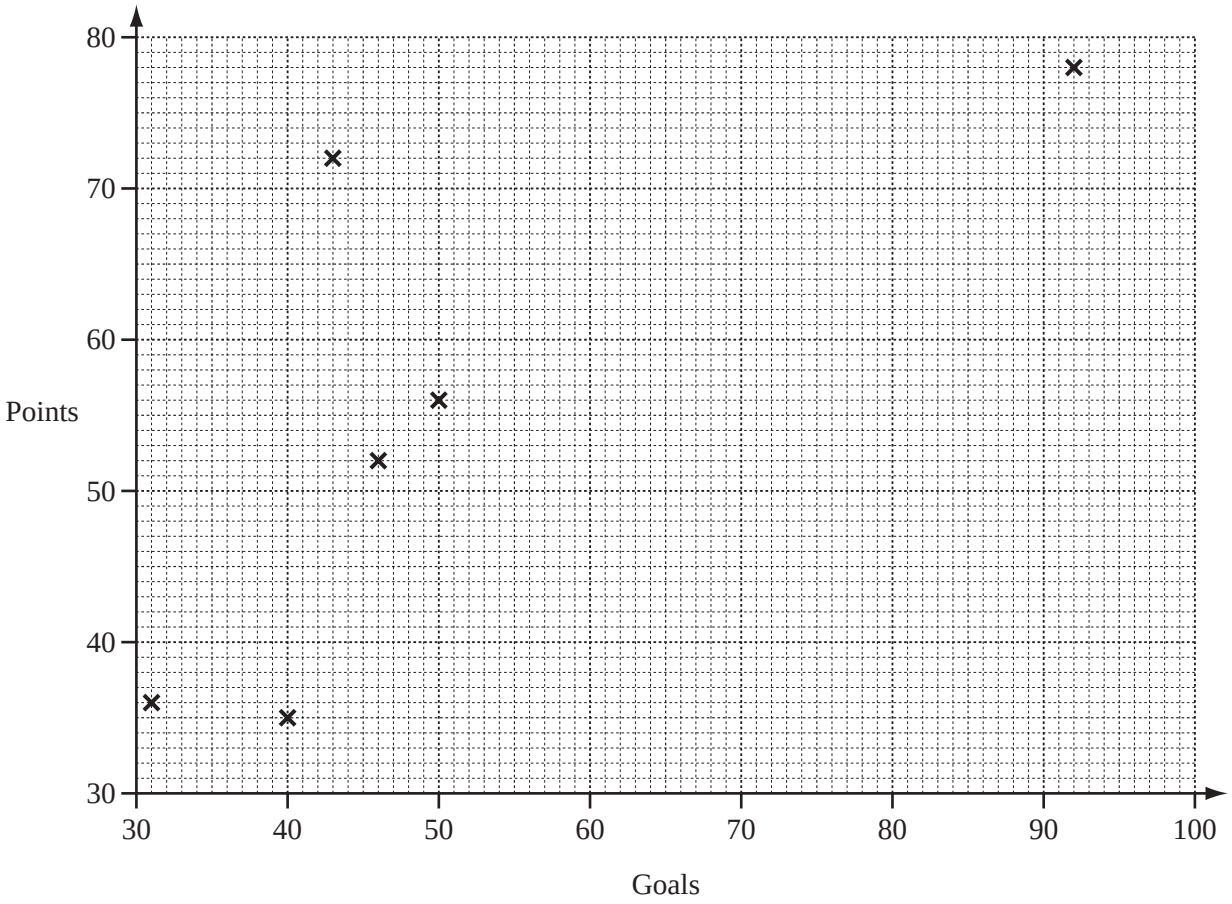
Work out the probability that Paolo's team scored at least 4 goals.

Answer(b)(iv) ..... [2]

(c) The table shows the total goals scored and the total points gained by 10 teams.

Team	A	B	C	D	E	F	G	H	I	J
Goals	31	40	46	50	43	92	60	84	68	87
Points	36	35	52	56	72	78	59	70	61	75

(i) Complete the scatter diagram.
The first six points have been plotted for you. [2]



(ii) Draw the line of best fit. [1]

(iii) What type of correlation is shown?

Answer(c)(iii) ..... [1]

(iv) Use your line of best fit to estimate the total points gained by a team scoring 75 goals.

Answer(c)(iv) ..... [1]

(v) Which team only scores a few goals but gains a lot of points?

Answer(c)(v) ..... [1]

5 **(a)** Jasmine works for 38 hours each week and she earns \$12.15 each hour.

(i) Calculate her earnings in one week.

Answer(a)(i) \$ ..... [1]

(ii) Jasmine pays 14% of her earnings in tax.

Calculate how much money she has left after tax is paid.

Answer(a)(ii) \$ ..... [2]

(iii) She pays $\frac{1}{3}$ of the money she has left after tax in rent.

Calculate how much rent she pays in one year (52 weeks).

Answer(a)(iii) \$ ..... [2]

(iv) In one week she spends \$140 on food and electricity in the ratio

$$\text{food} : \text{electricity} = 3 : 2 .$$

Calculate how much she spends on food.

Answer(a)(iv) \$ ..... [2]

(b) Jasmine buys a watch for 10 000 Japanese Yen (¥).
The exchange rate is \$1 = ¥ 80.4 .

Calculate the cost of this watch in dollars, giving your answer correct to the nearest dollar.

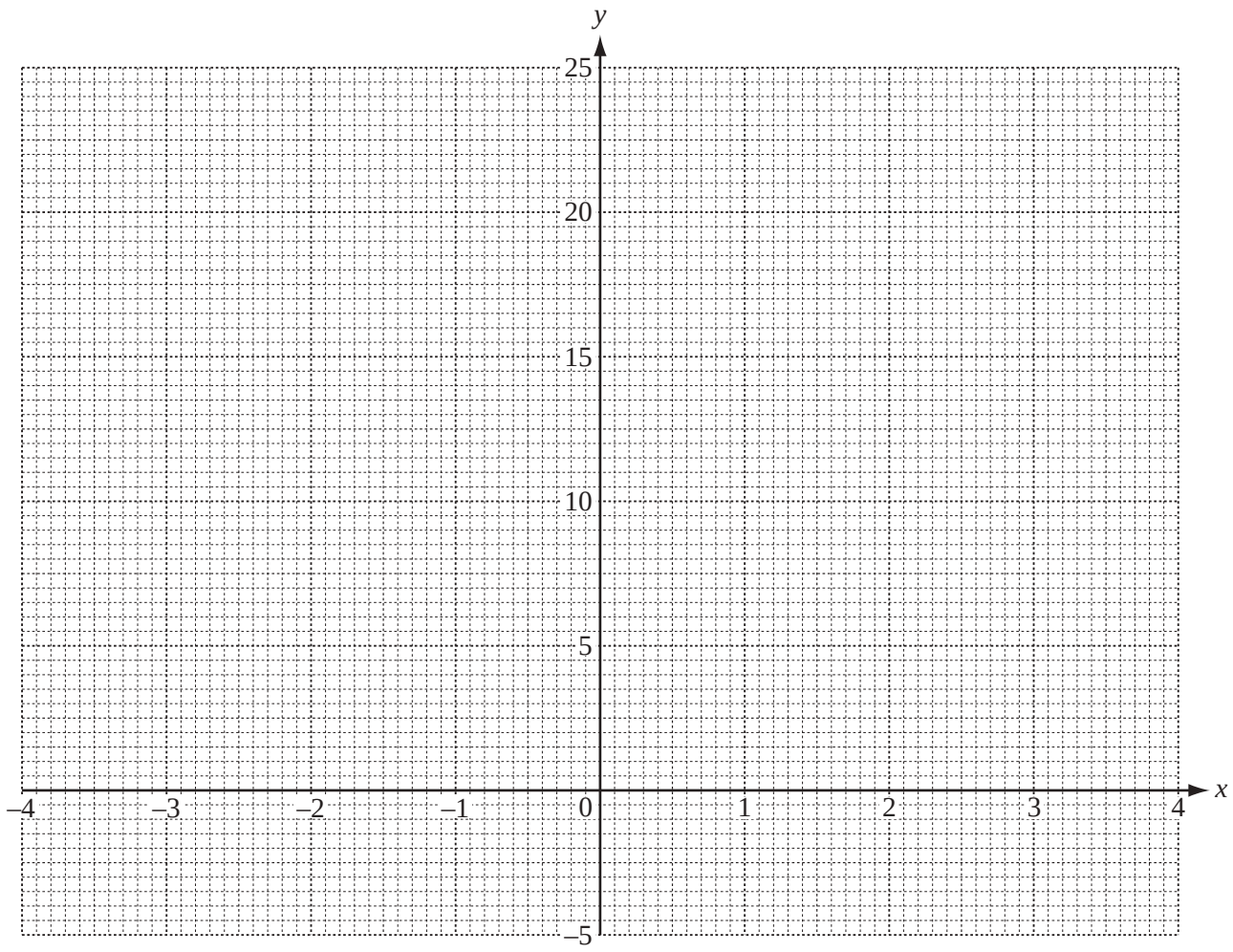
Answer(b) \$ ..... [3]

6 **(a)** Complete the table of values for $y = x^2 + 2x - 3$.

x	–4	–3	–2	–1	0	1	2	3	4
y		0	–3	–4	–3	0	5		21

[2]

(b) On the grid, draw the graph of $y = x^2 + 2x - 3$ for $-4 \leqslant x \leqslant 4$.



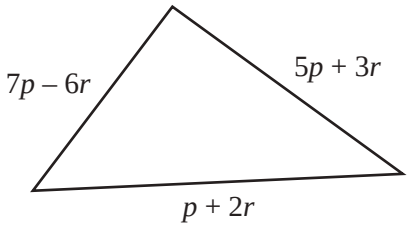
[4]

(c) On the grid, draw the line $y = 10$. [1]

(d) Use your graphs to solve the equation $x^2 + 2x - 3 = 10$ for $-4 \leqslant x \leqslant 4$.

Answer(d) $x =$ ..... [1]

7 **(a)**



NOT TO SCALE

Write an expression for the perimeter of this triangle.
Give your answer in its simplest form.

Answer(a) ..... [2]

(b) Another triangle has a perimeter $12w - 2z$.

Calculate this perimeter when $w = 16$ and $z = -3$.

Answer(b) ..... [2]

(c) Solve.

(i) $5a = 32$

Answer(c)(i) $a =$ ..... [1]

(ii) $5b + 23 = 8$

Answer(c)(ii) $b =$ ..... [2]

(iii) $5c + 7 = 2(c - 10)$

Answer(c)(iii) $c =$ ..... [3]

(d) **(i)** Multiply out the brackets.

$$8(2x + 3)$$

Answer(d)(i) ..... [1]

(ii) Factorise completely.

$$6x^2 - 12x$$

Answer(d)(ii) ..... [2]

(e) Write each expression in its simplest form.

(i) $3q^4 \times 5q^2$

Answer(e)(i) ..... [2]

(ii) $t^8 \div t^2$

Answer(e)(ii) ..... [1]

8 **(a)** Work out.

(i) $5\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Answer(a)(i) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(ii) $\begin{pmatrix} 4 \\ -5 \end{pmatrix} + \begin{pmatrix} 3 \\ -1 \end{pmatrix}$

Answer(a)(ii) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) A translation moves the point (6, 3) to the point (2, 8).

Work out the vector which represents this translation.

Answer(b) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

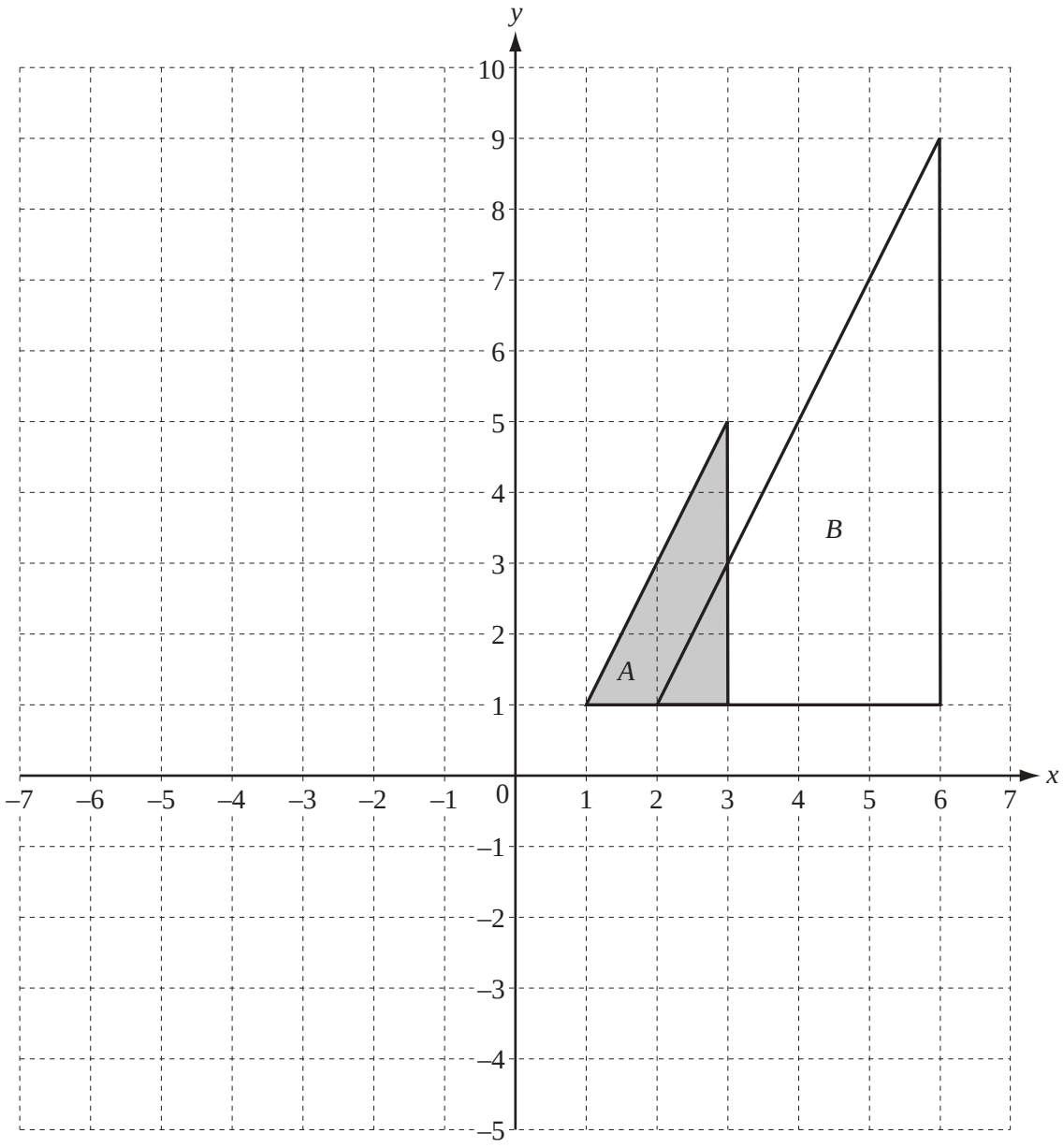
(c) A point P is translated by the vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ to the point (7, –2).

Find the co-ordinates of P.
You may use the grid below to help you.

Answer(c) (..... , ...) [1]

Question 9 is printed on the next page.

9



(a) On the grid, draw the image of triangle *A* after the following transformations.

(i) Reflection in the *x*-axis. [1]

(ii) Rotation about (0, 0) through 180°. [2]

(iii) Translation by the vector $\begin{pmatrix} -5 \\ 3 \end{pmatrix}$. [2]

(b) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

Answer(b) .....

..... [3]