

1MA1 Higher themed papers: Transformations

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
Mathematics Transformations			
			Paper Reference 1MA1
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.			Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

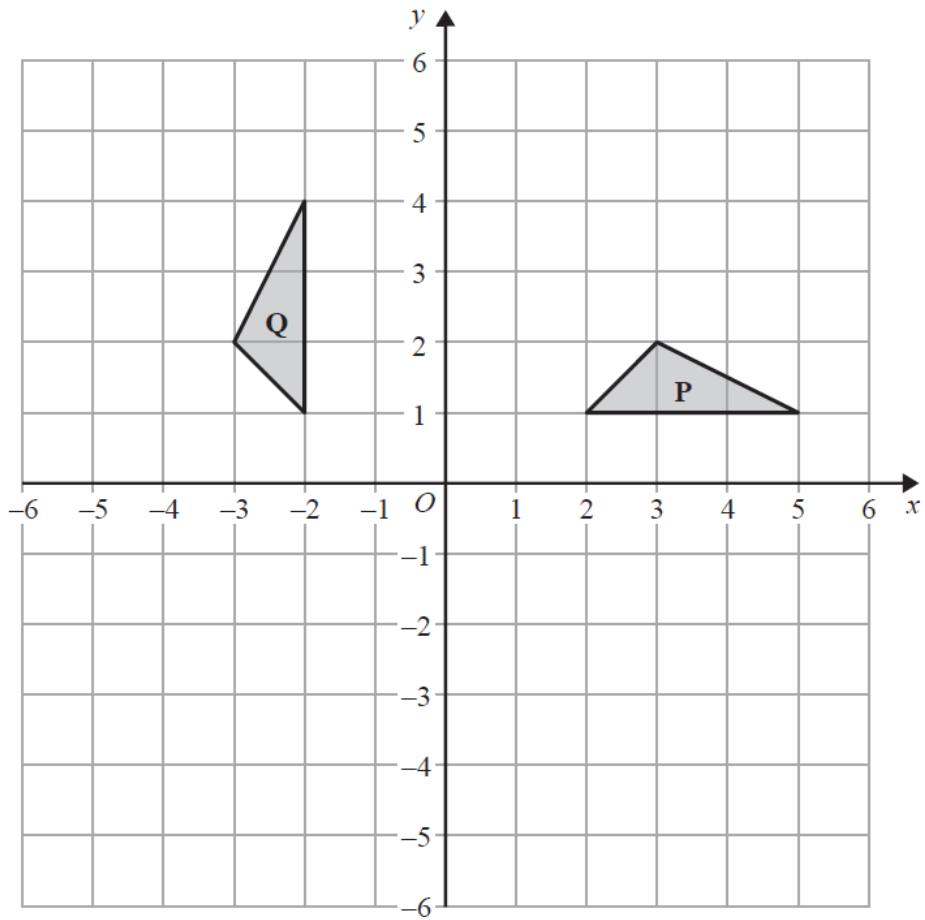
- The total mark for this paper is **38**. There are **17** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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1



Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

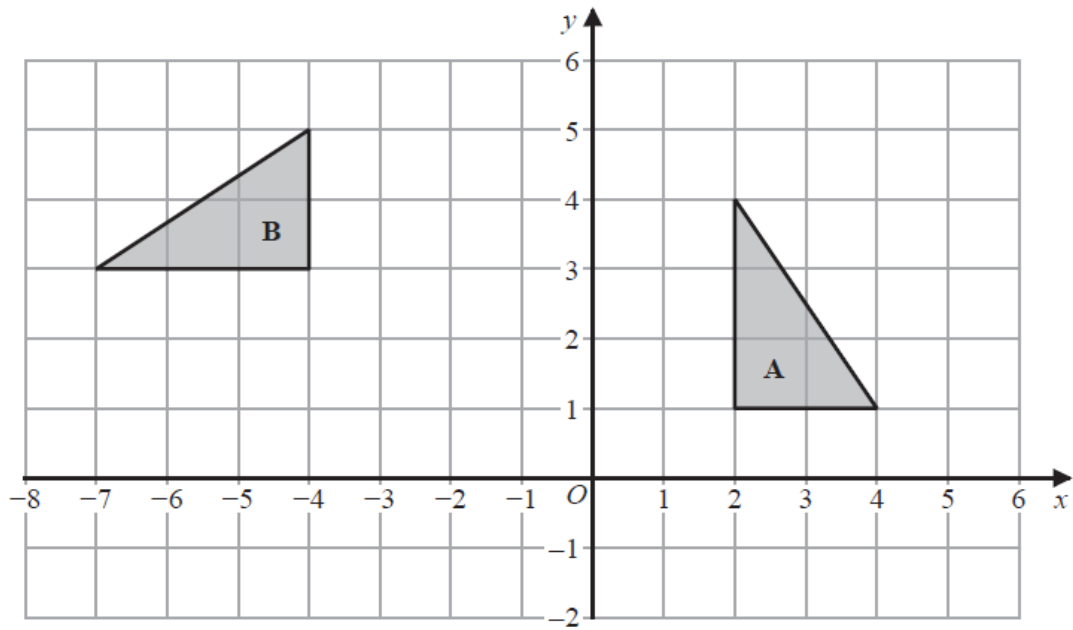
.....
.....

(Total for Question 1 is 2 marks)

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2



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

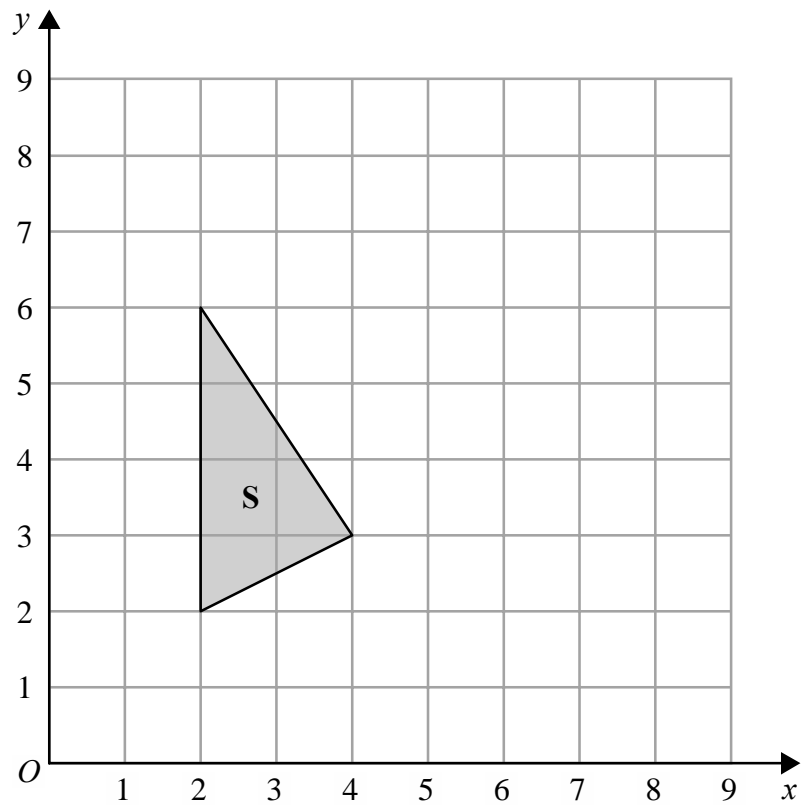
.....

.....

(Total for Question 2 is 2 marks)

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3



(a) Rotate shape **S** 90° clockwise, centre (5, 4)
Label your image **T**.

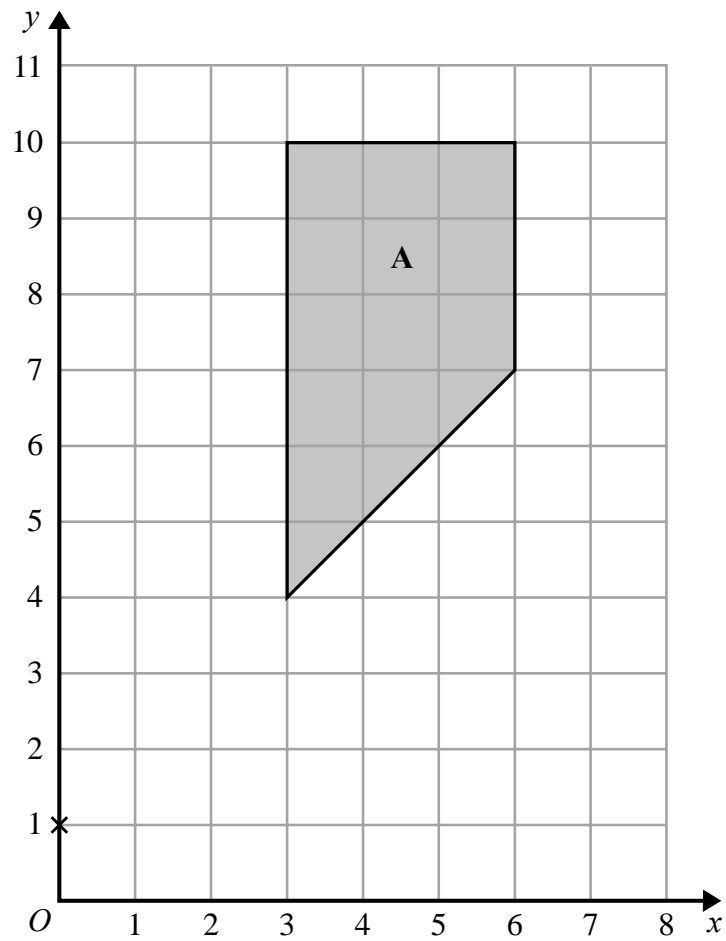
(2)

(b) Describe fully the single transformation that will map shape **T** onto shape **S**.

.....
(1)

(Total for Question 3 is 3 marks)

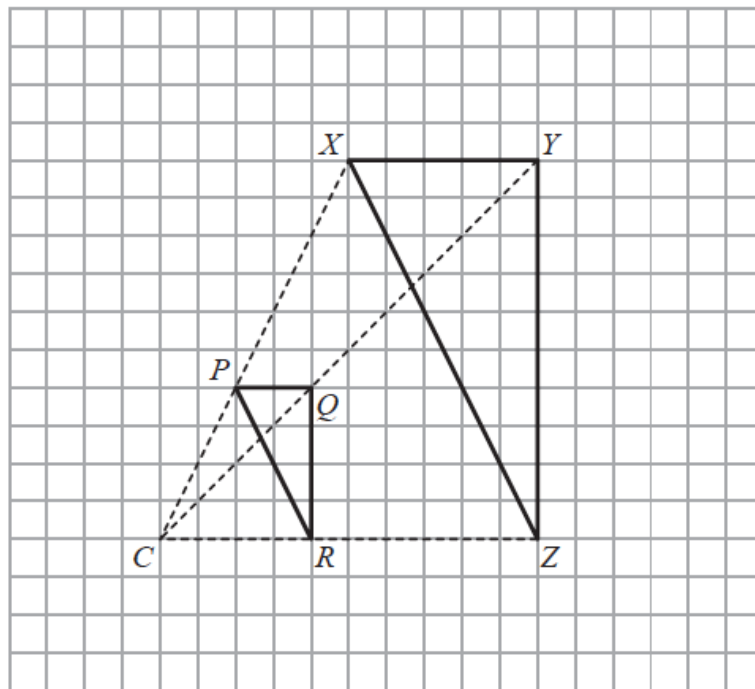
4



Enlarge shape A by scale factor $\frac{1}{3}$ centre (0, 1)

(Total for Question 4 is 2 marks)

5



Roy is going to enlarge triangle PQR with centre C and scale factor $1\frac{1}{2}$

He draws triangle XYZ .

(b) Explain why Roy's diagram is **not** correct.

.....

.....

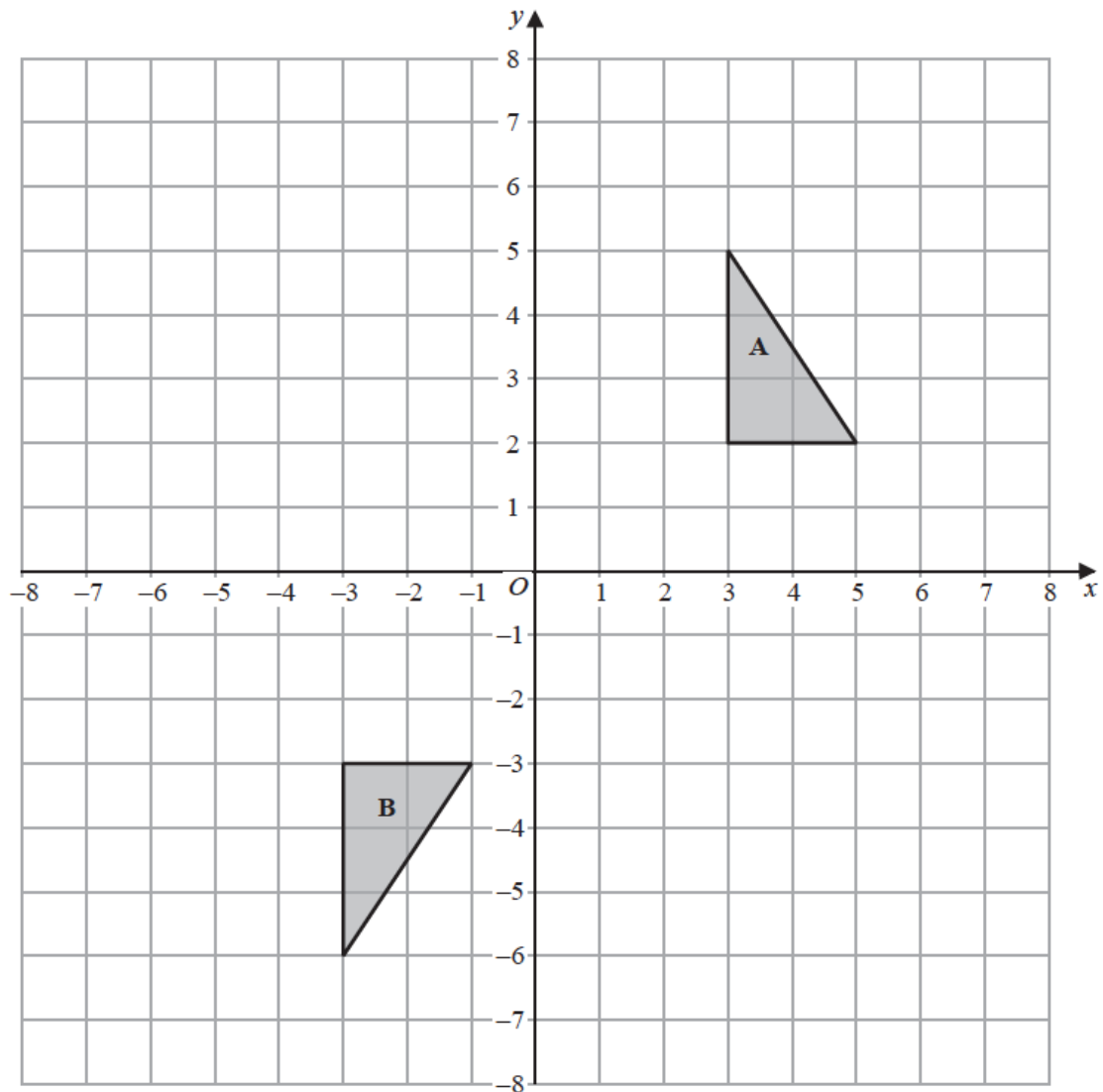
.....

(1)

(Total for Question 5 is 2 marks)



6



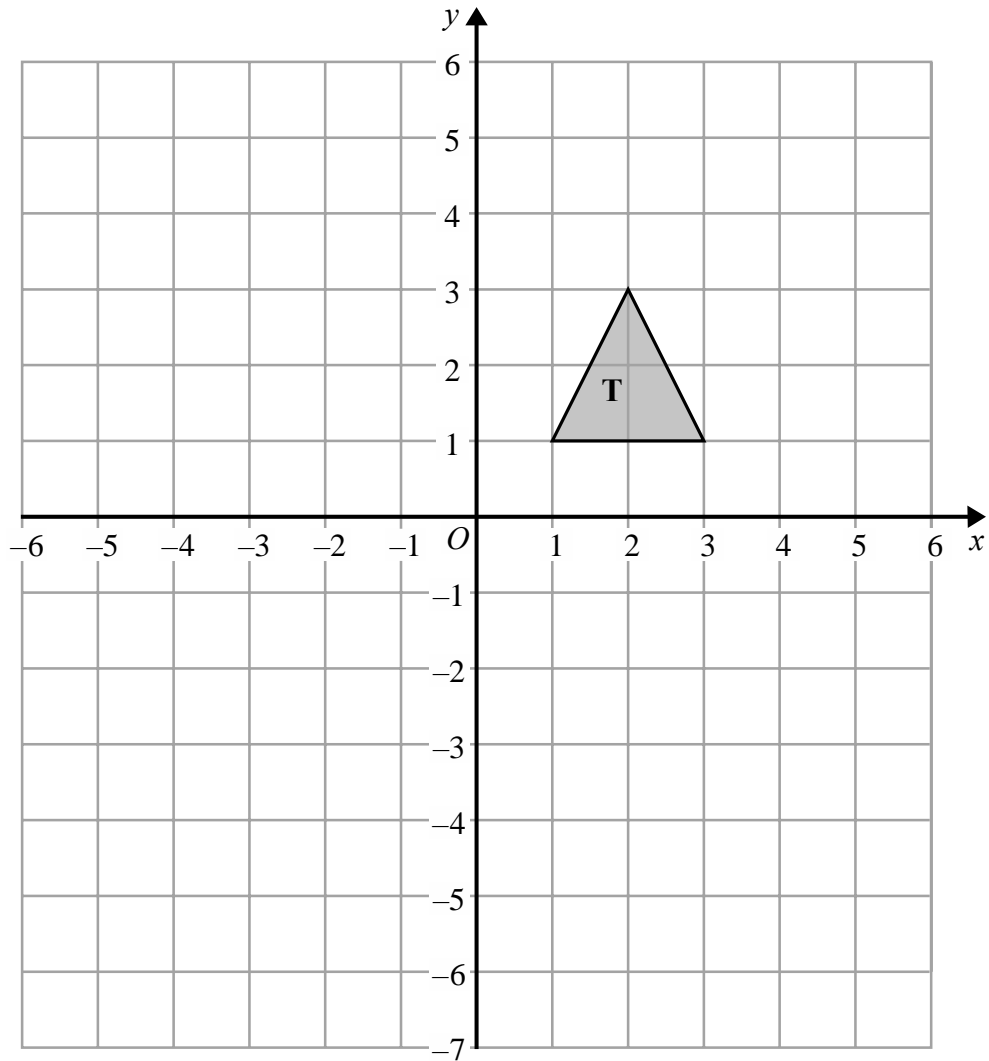
Shape **A** can be transformed to shape **B** by a reflection in the x -axis followed by a translation $\begin{pmatrix} c \\ d \end{pmatrix}$

Find the value of c and the value of d .

$c = \dots\dots\dots$

$d = \dots\dots\dots$

(Total for Question 6 is 3 marks)



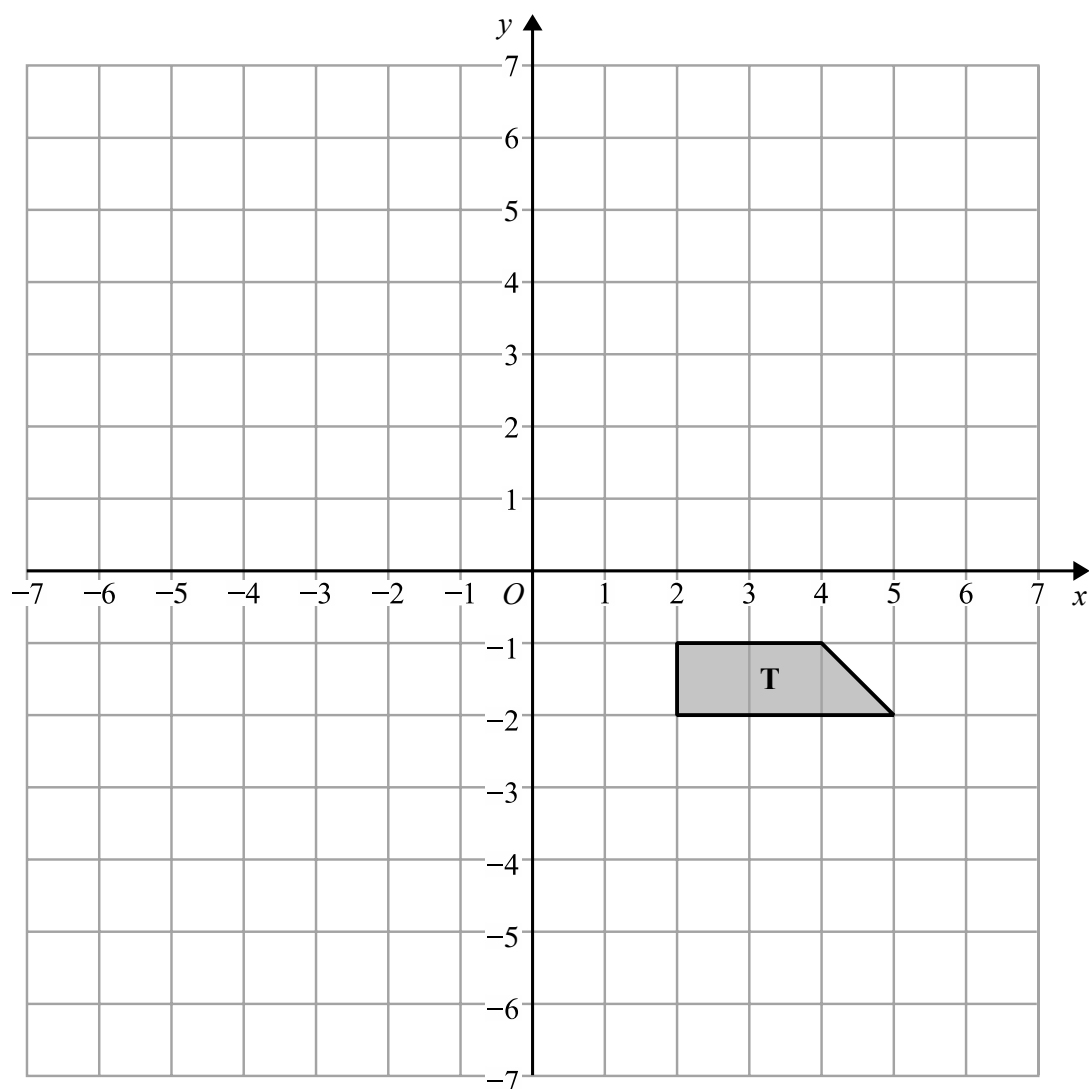
Shape **T** is reflected in the line $x = -1$ to give shape **R**.
Shape **R** is reflected in the line $y = -2$ to give shape **S**.

Describe the **single** transformation that will map shape **T** to shape **S**.

.....
.....
.....

(Total for Question 7 is 2 marks)

8



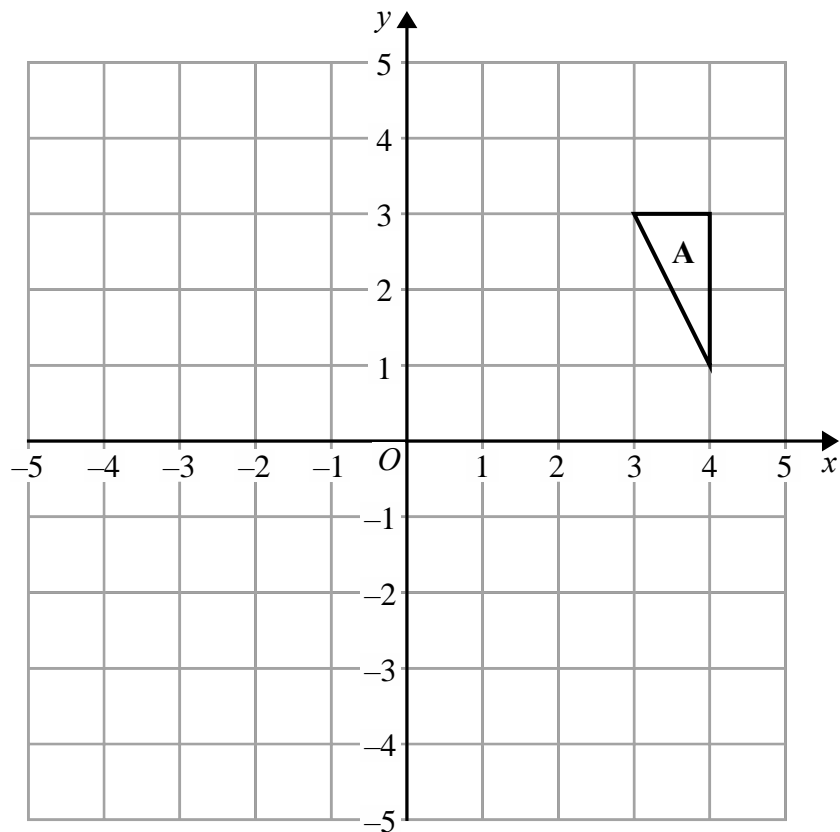
(a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**. (1)

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$
Label the new trapezium **B**. (1)

(Total for Question 8 is 2 marks)

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- 9 The diagram shows triangle **A** drawn on a grid.



Kyle reflects triangle **A** in the x -axis to get triangle **B**.

He then reflects triangle **B** in the line $y = x$ to get triangle **C**.

Amy reflects triangle **A** in the line $y = x$ to get triangle **D**.

She is then going to reflect triangle **D** in the x -axis to get triangle **E**.

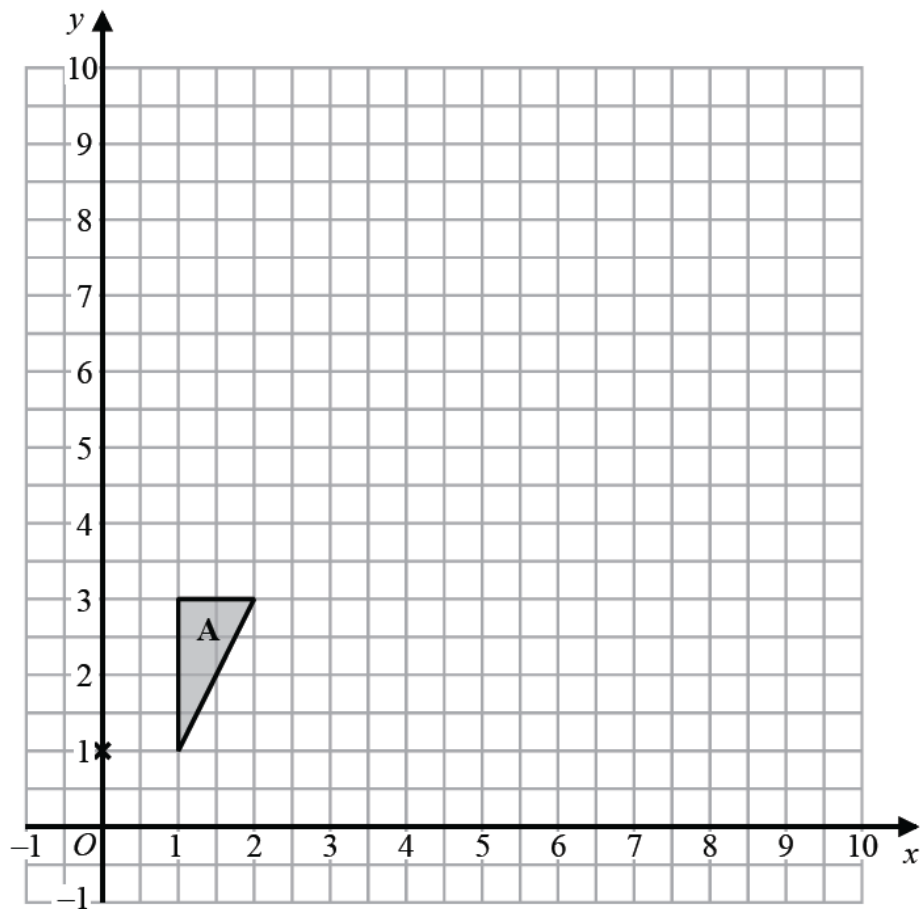
Amy says that triangle **E** should be in the same position as triangle **C**.

Is Amy correct?

You must show how you get your answer.

(Total for Question 9 is 3 marks)

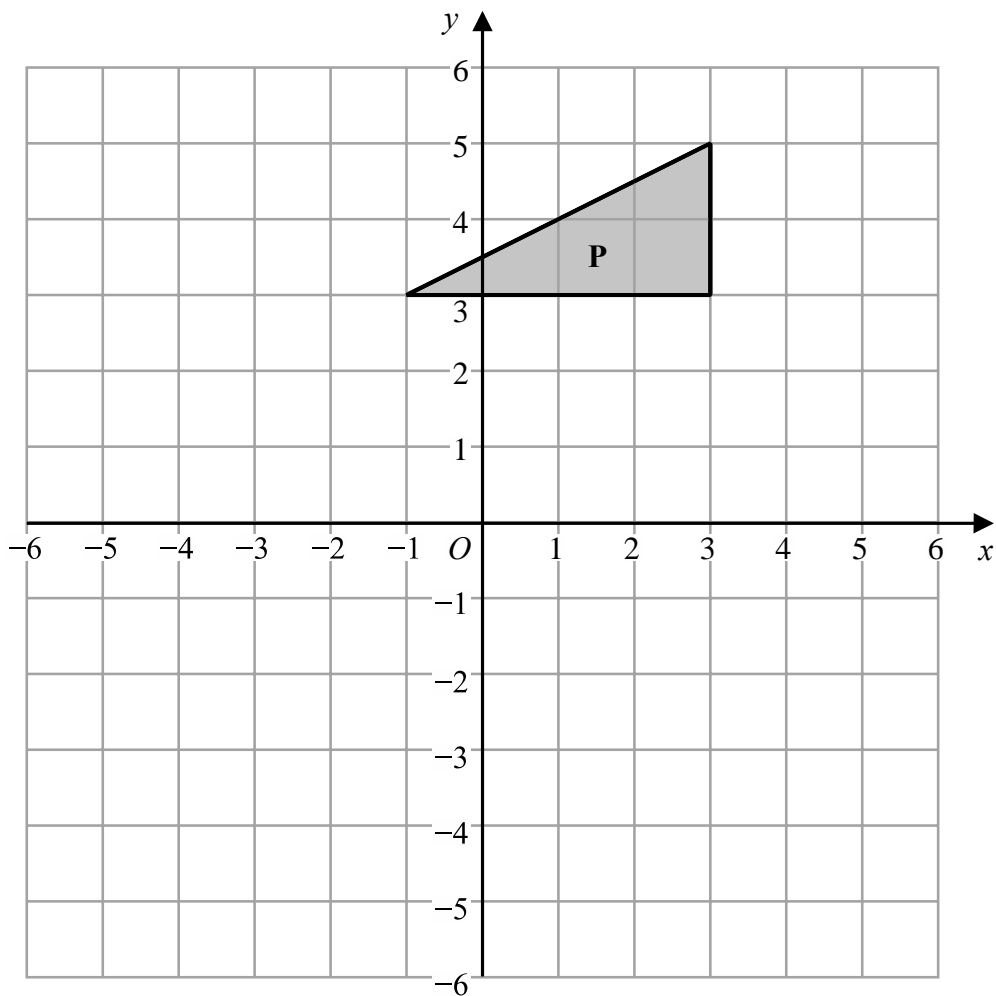
10



Enlarge triangle **A** by scale factor 2.5 with centre (0, 1)

(Total for Question 10 is 2 marks)

11



Triangle **P** is reflected in the line $y = -x$ to give triangle **Q**.

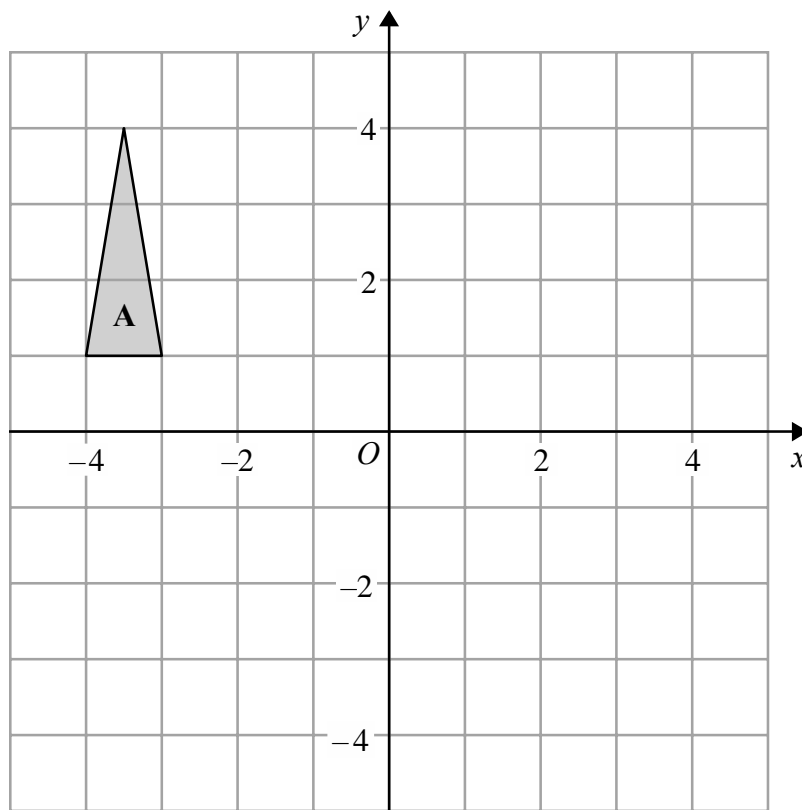
Triangle **Q** is reflected in the line $x = -1$ to give triangle **R**.

Describe fully the single transformation that maps triangle **R** to triangle **P**.

.....

(Total for Question 11 is 3 marks)

12



Triangle **A** is transformed by the combined transformation of a rotation of 180° about the

point $(-2, 0)$ followed by a translation with vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

One point on triangle **A** is invariant under the combined transformation.

Find the coordinates of this point.

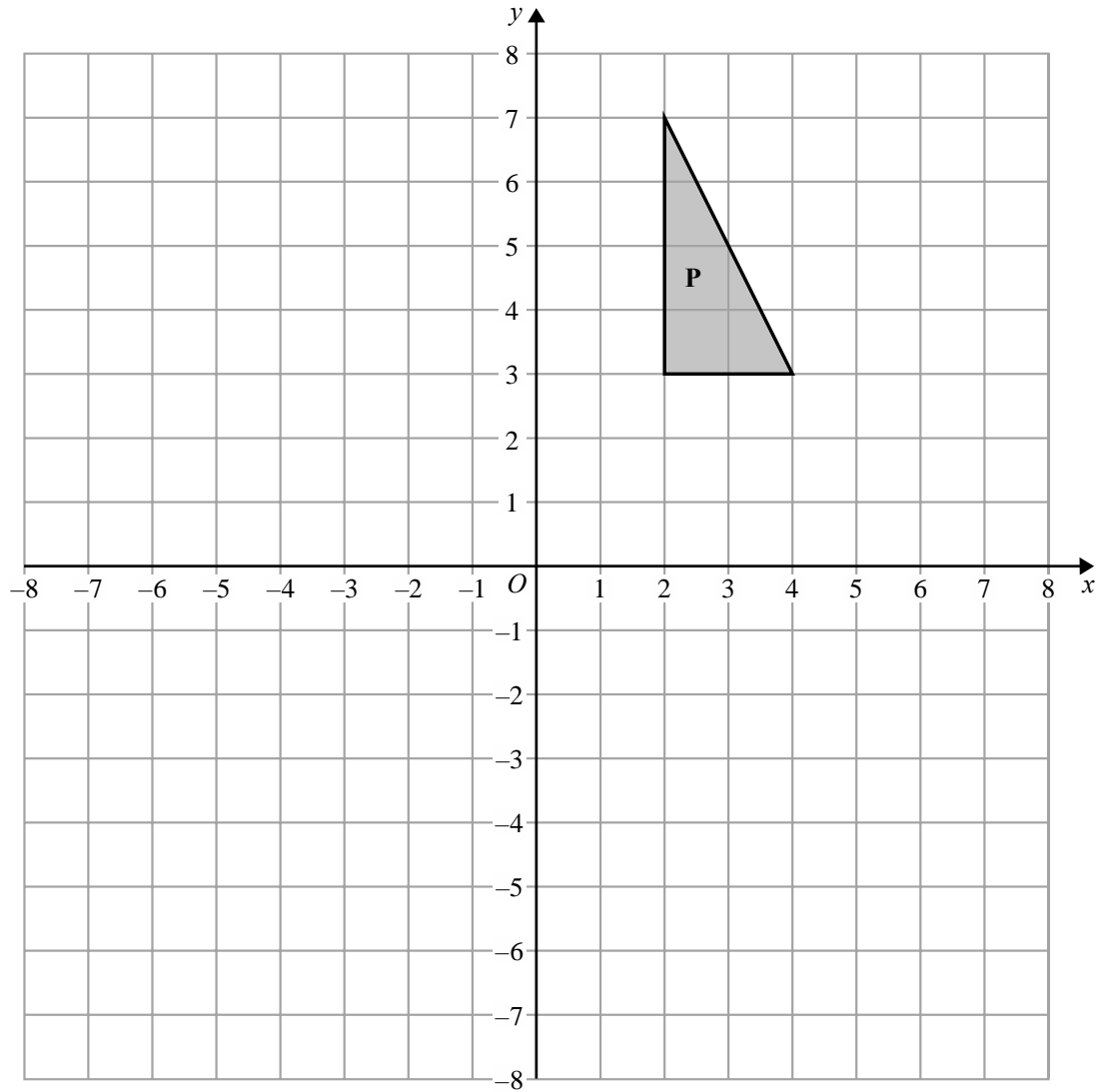
(..... ,)

(Total for Question 12 is 2 marks)

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13



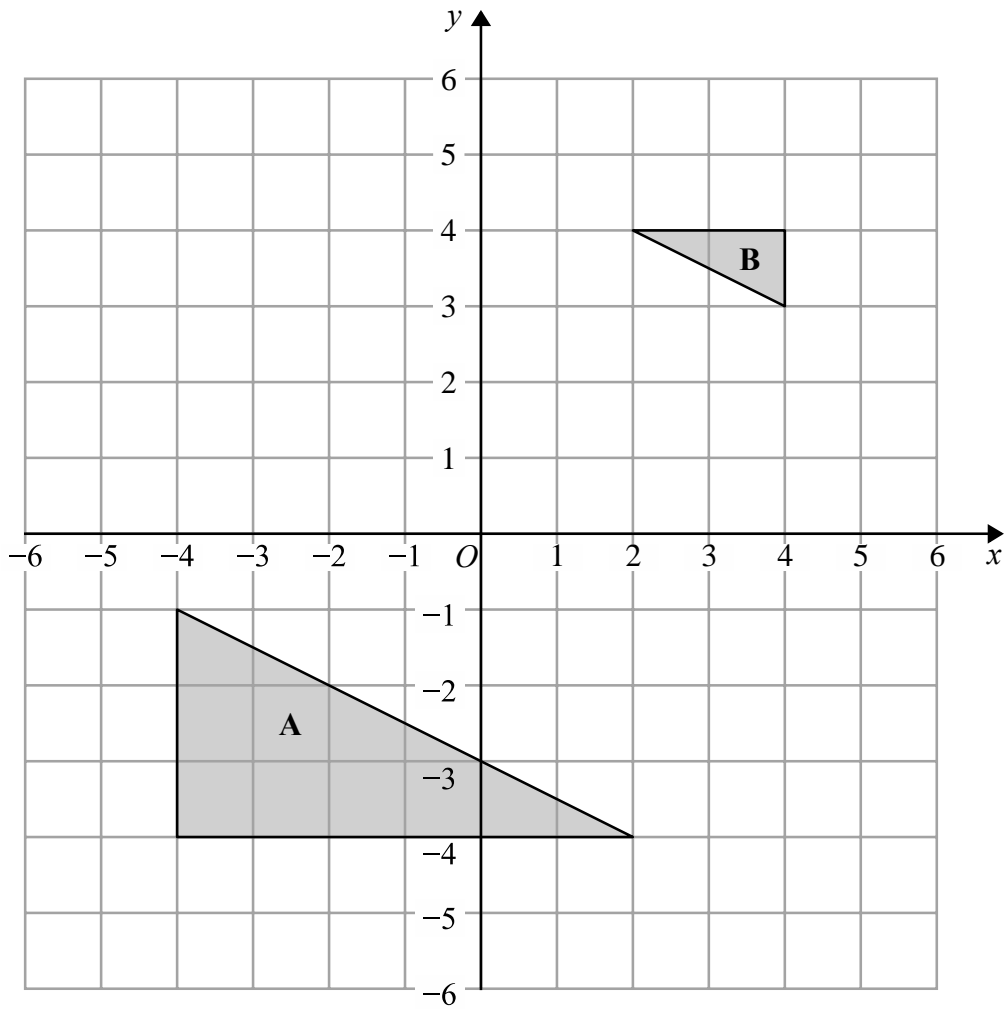
Enlarge shape **P** by scale factor $-\frac{1}{2}$ with centre of enlargement $(0, 0)$.

Label your image **Q**.

(Total for Question 13 is 2 marks)



14

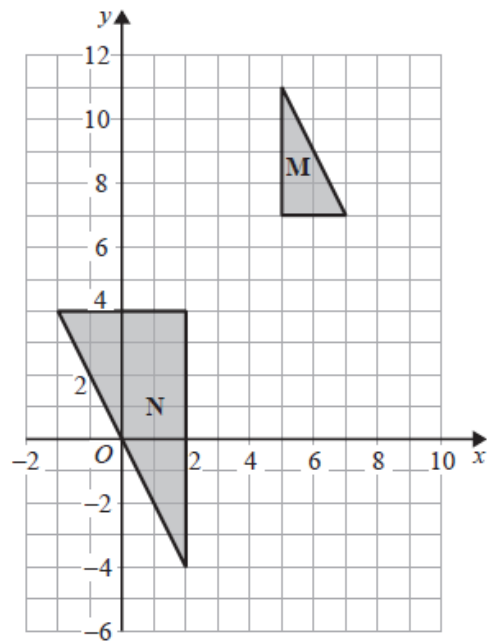


Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....

(Total for Question 14 is 2 marks)

15



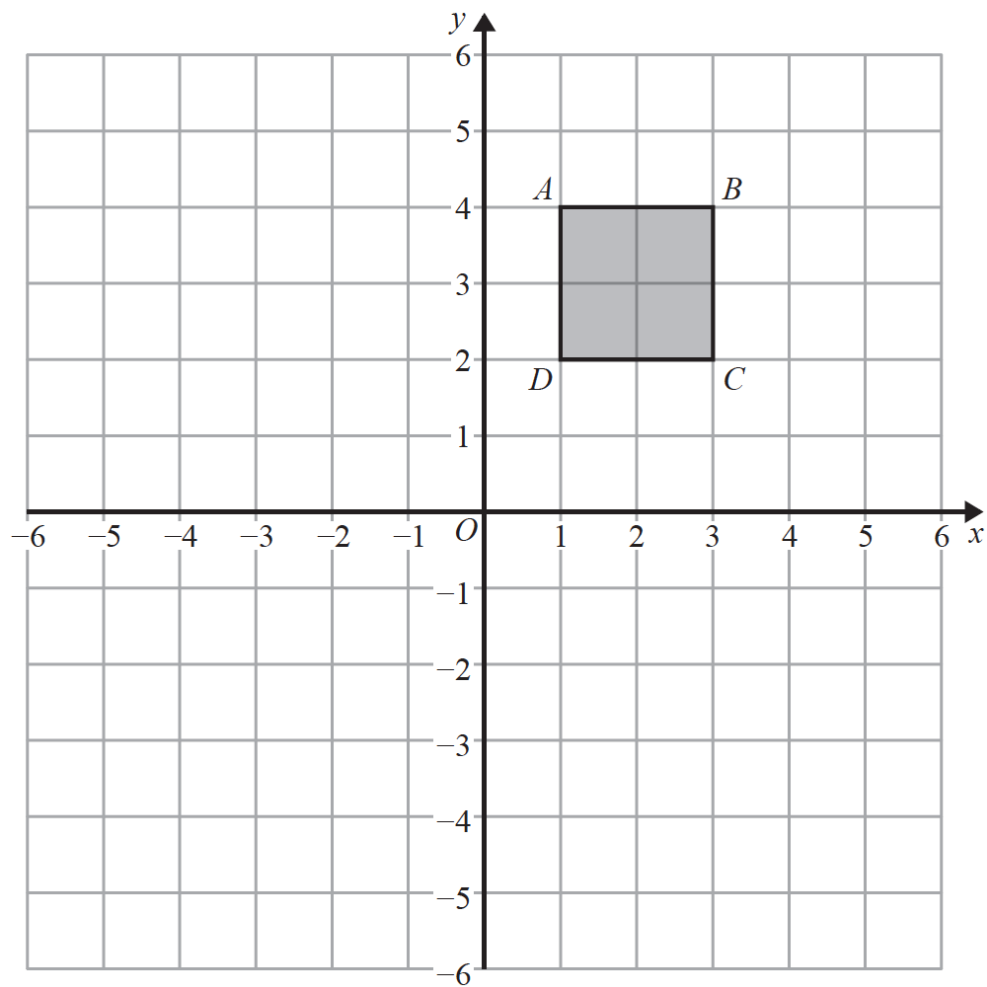
Describe fully the single transformation that maps triangle **M** onto triangle **N**.

.....

.....

(Total for Question 15 is 2 marks)

16



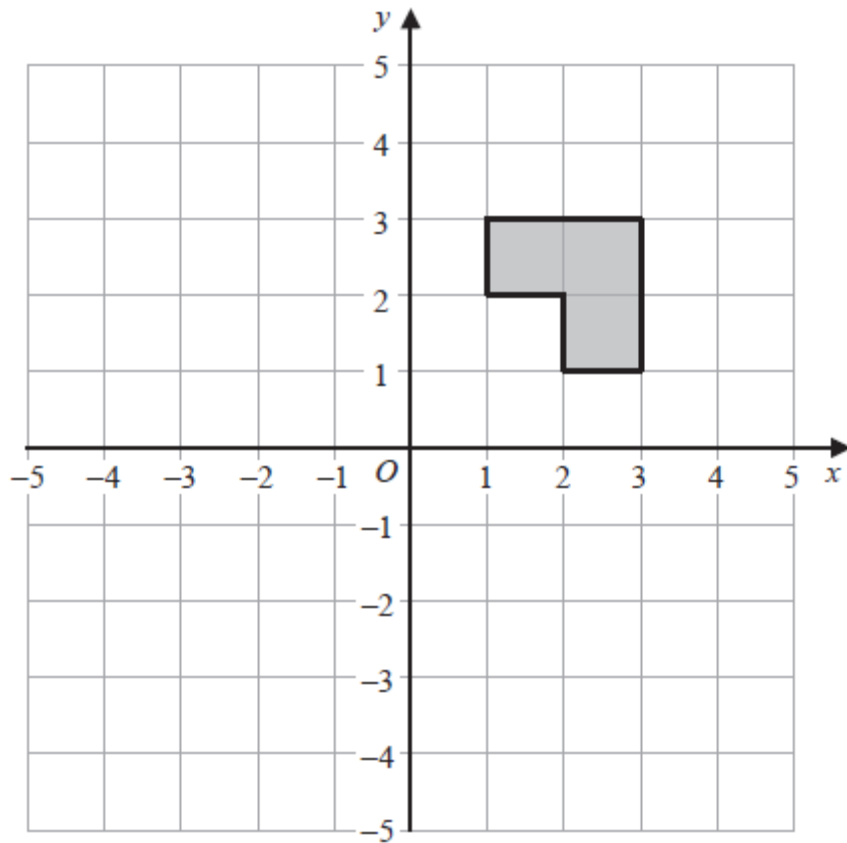
Square $ABCD$ is transformed by a combined transformation of a reflection in the line $x = -1$ followed by a rotation.

Under the combined transformation, two vertices of the square $ABCD$ are invariant.

Describe fully one possible rotation.

.....

(Total for Question 16 is 2 marks)

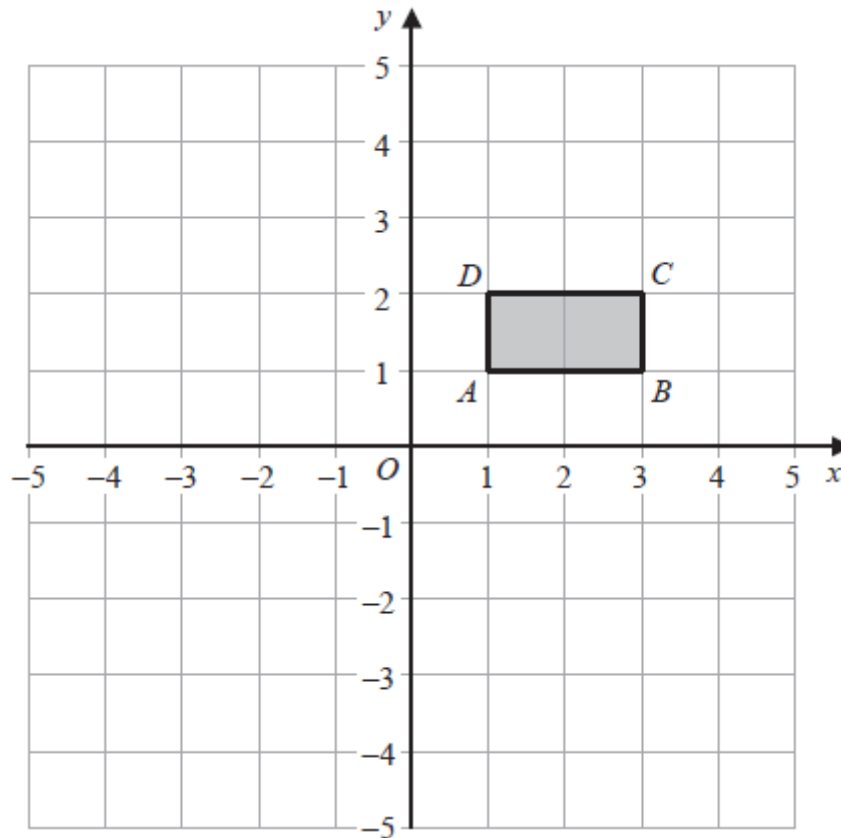


The shaded shape is rotated 180° about the point $(2, 2)$

(a) How many of the vertices of the shaded shape are invariant?

.....
(1)

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Rectangle $ABCD$ is transformed by a combination of two transformations so that

all points on AB are invariant
and there are no other invariant points.

The first transformation is

a reflection in the line with equation $y = k$, where k is an integer and $k \neq 1$

(b) Describe fully the second transformation.

.....
.....

(2)

(Total for Question 17 is 3 marks)

TOTAL MARKS FOR PAPER: 38