Name ANSWERS	Class

MATHS TEACHER HUB

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Transformations

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

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.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

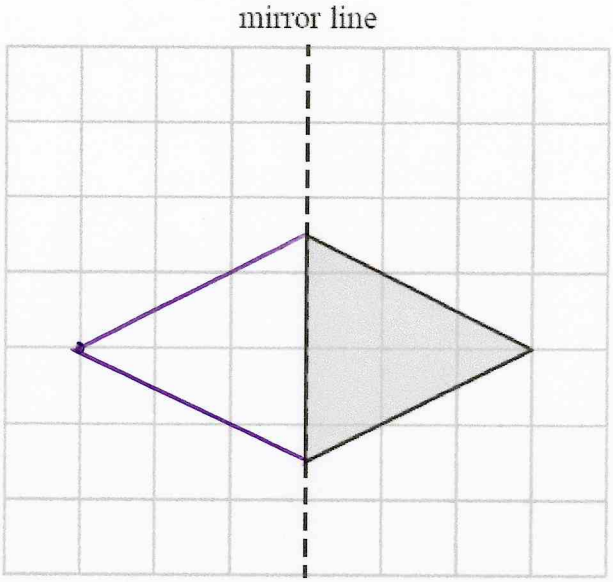
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

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.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

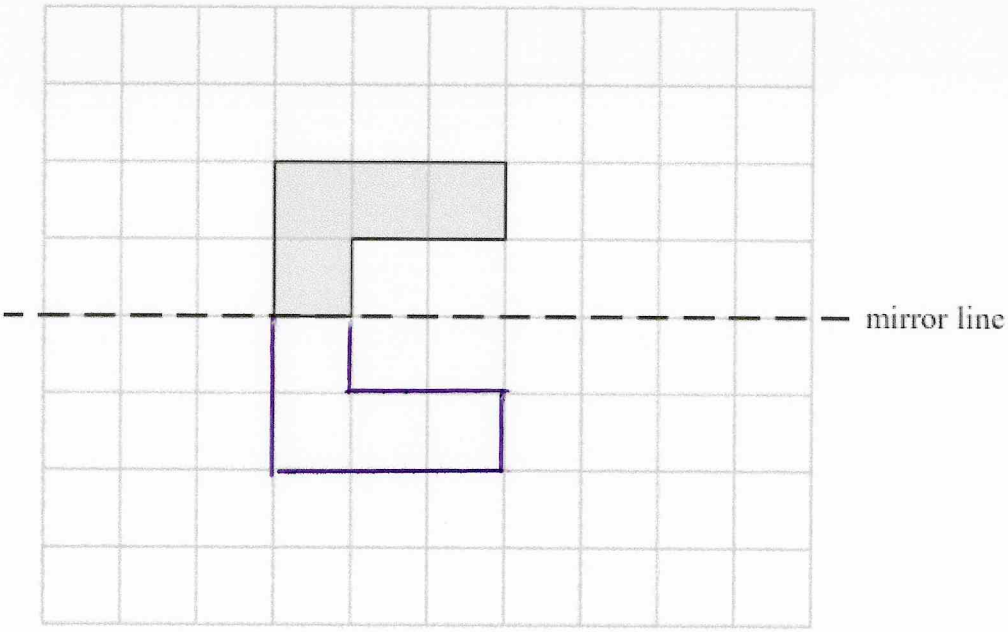
3 On the grid, reflect the shaded triangle in the mirror line.



June 2022 – Paper 1F

(Total for Question 3 is 1 mark)

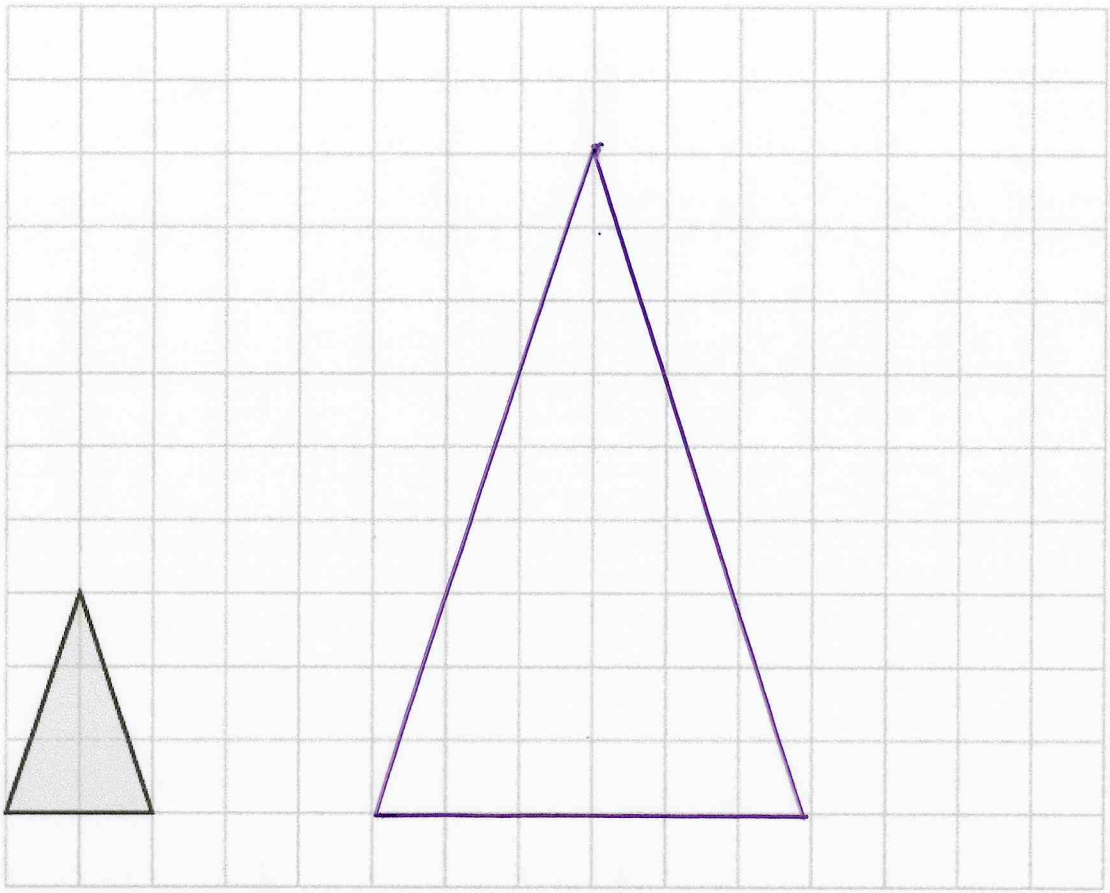
10 On the grid, reflect the shaded shape in the mirror line.



November 2018 – Paper 3F

(Total for Question 10 is 1 mark)

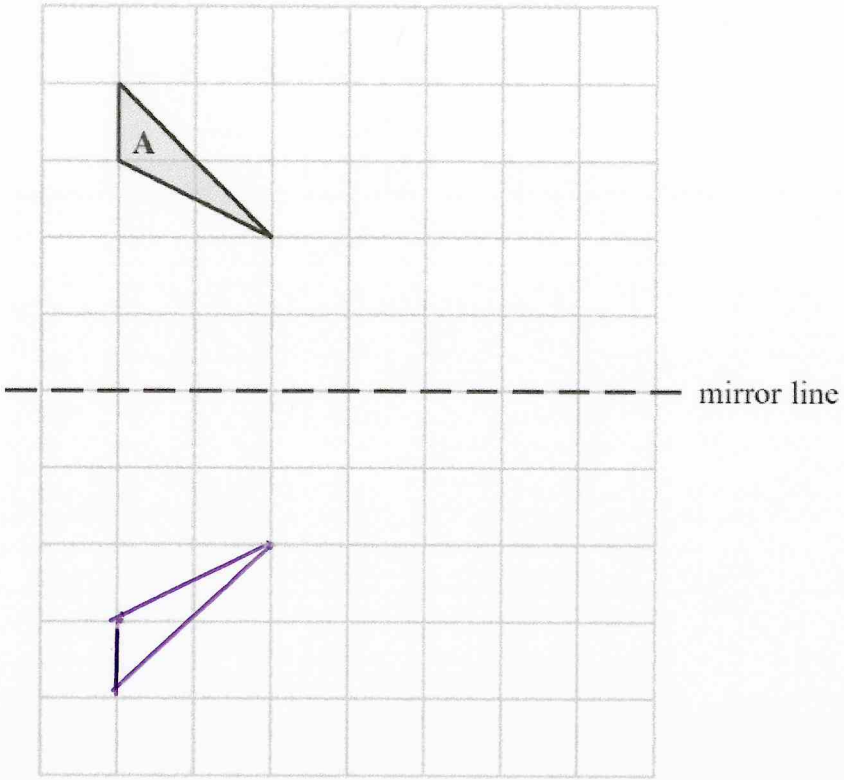
11



On the grid, draw an enlargement of the triangle with a scale factor of 3

(Total for Question 11 is 2 marks)

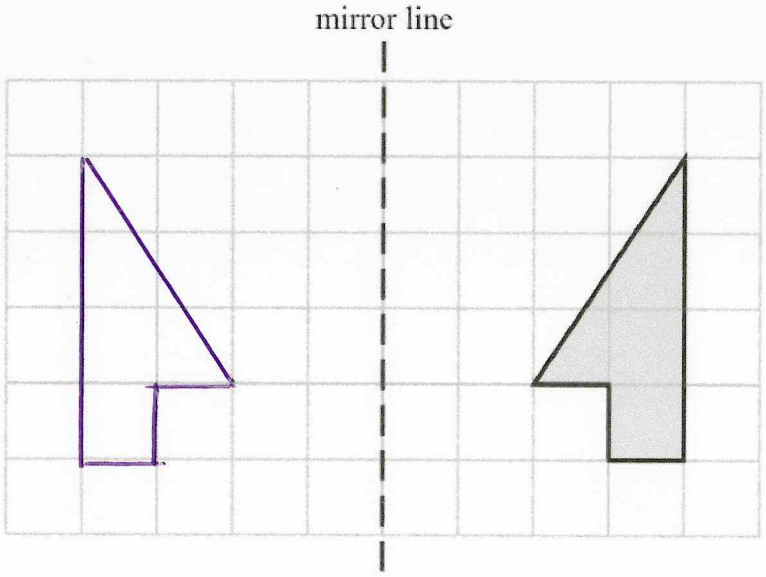
11 Reflect shape **A** in the mirror line.



November 2021 – Paper 1F

(Total for Question 11 is 2 marks)

11

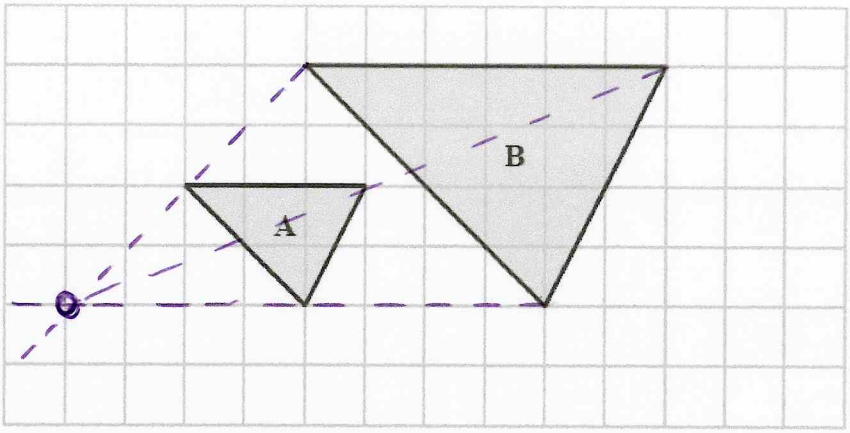


Reflect the shaded shape in the mirror line.

May 2020 – Paper 1F

(Total for Question 11 is 2 marks)

11 Here are two triangles on a grid.



Triangle **B** is an enlargement of triangle **A**.

(a) (i) Write down the scale factor of the enlargement.

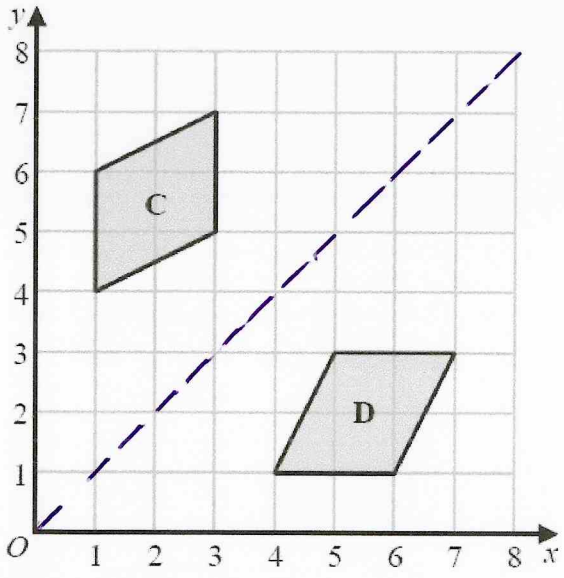
SF = 2

(1)

(ii) On the grid, mark with a cross (×) the centre of enlargement.

(1)

Here are two parallelograms on a coordinate grid.



Parallelogram **D** is a reflection of parallelogram **C**.

(b) (i) On the grid, draw the mirror line.

(1)

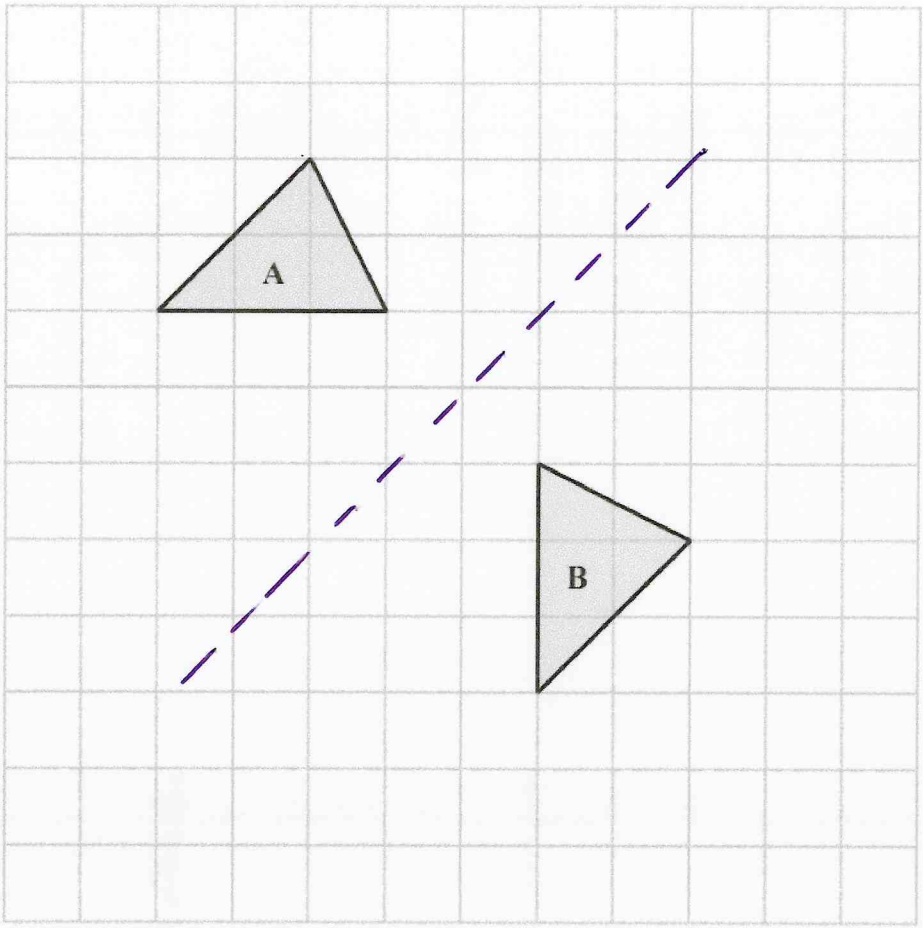
(ii) Write down an equation of this mirror line.

y = x

(1)

(Total for Question 11 is 4 marks)

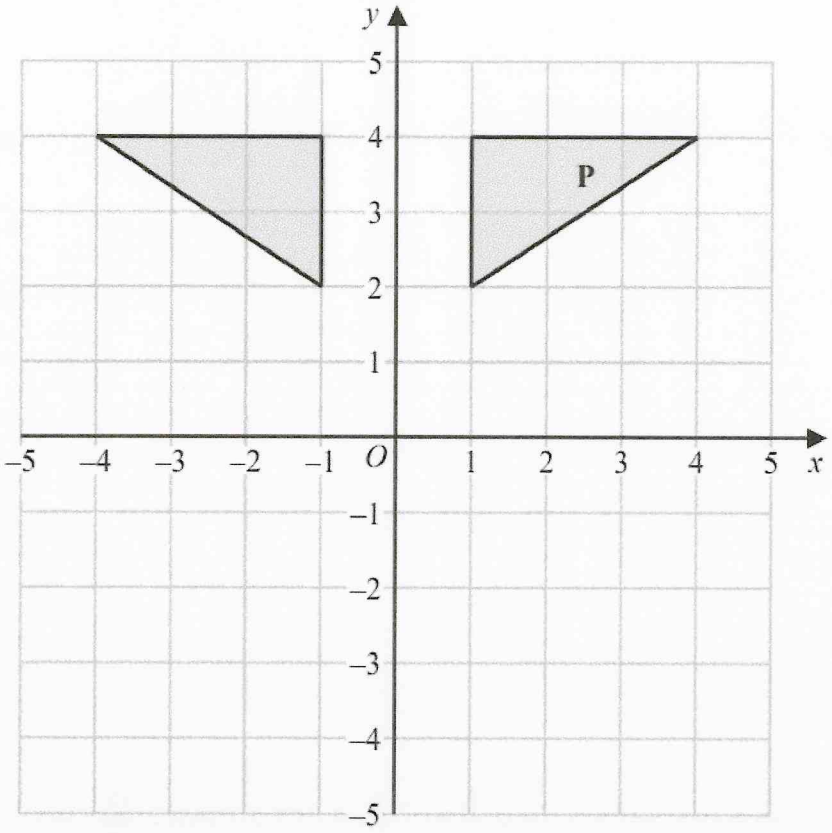
12 Shape **A** is reflected in a mirror line to give shape **B**.



(a) On the grid, draw the mirror line.

(1)

(b) Alex is asked to reflect shape **P** in the x-axis.
Here is the diagram Alex draws.



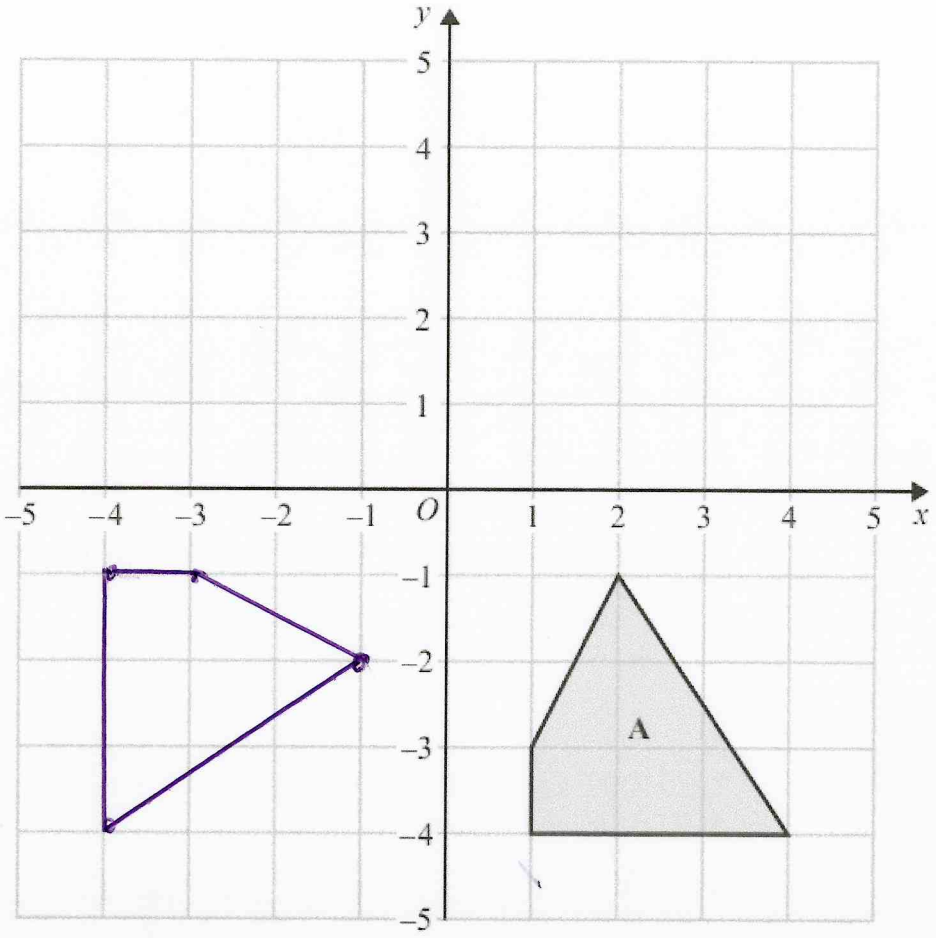
Explain the mistake Alex has made.

He has reflected shape P in the yaxis

(1)

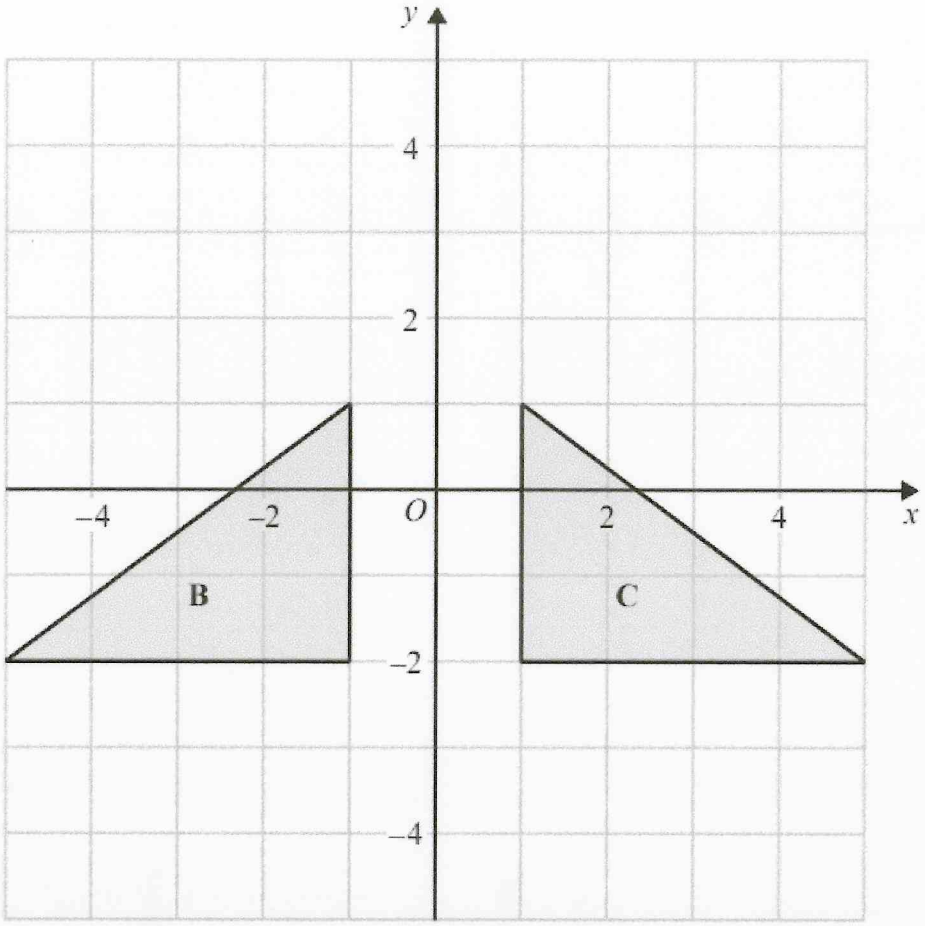
(Total for Question 12 is 2 marks)

13



(a) Rotate shape **A** 90° clockwise about centre *O*.

(2)



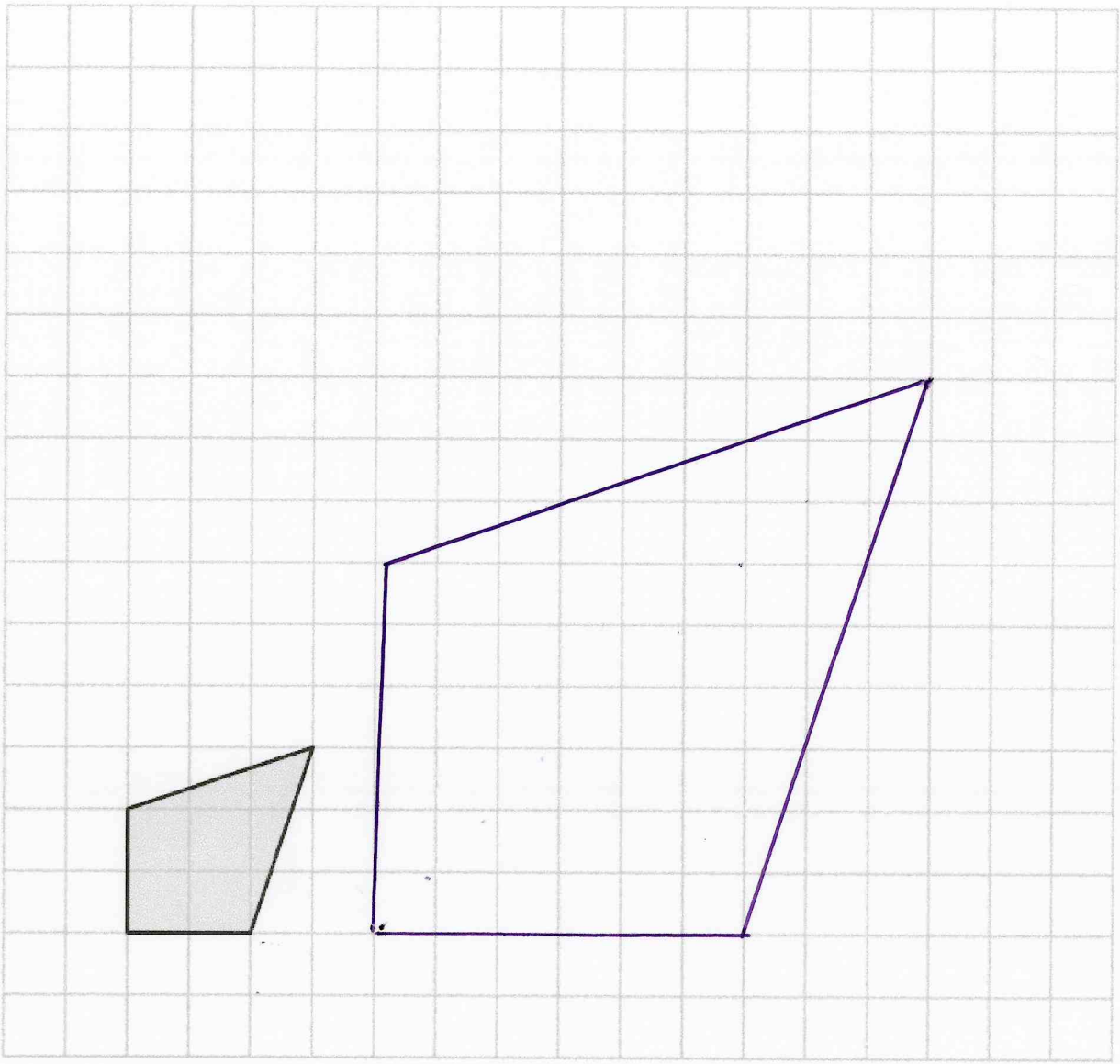
(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.

Reflection in the y axis.

(2)

(Total for Question 13 is 4 marks)

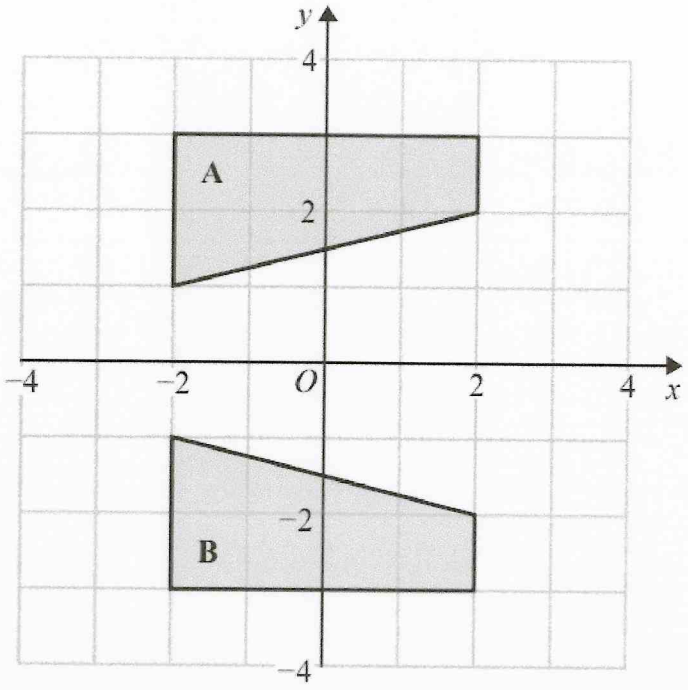
13



On the grid, draw an enlargement of the shaded shape with a scale factor of 3

(Total for Question 13 is 2 marks)

14

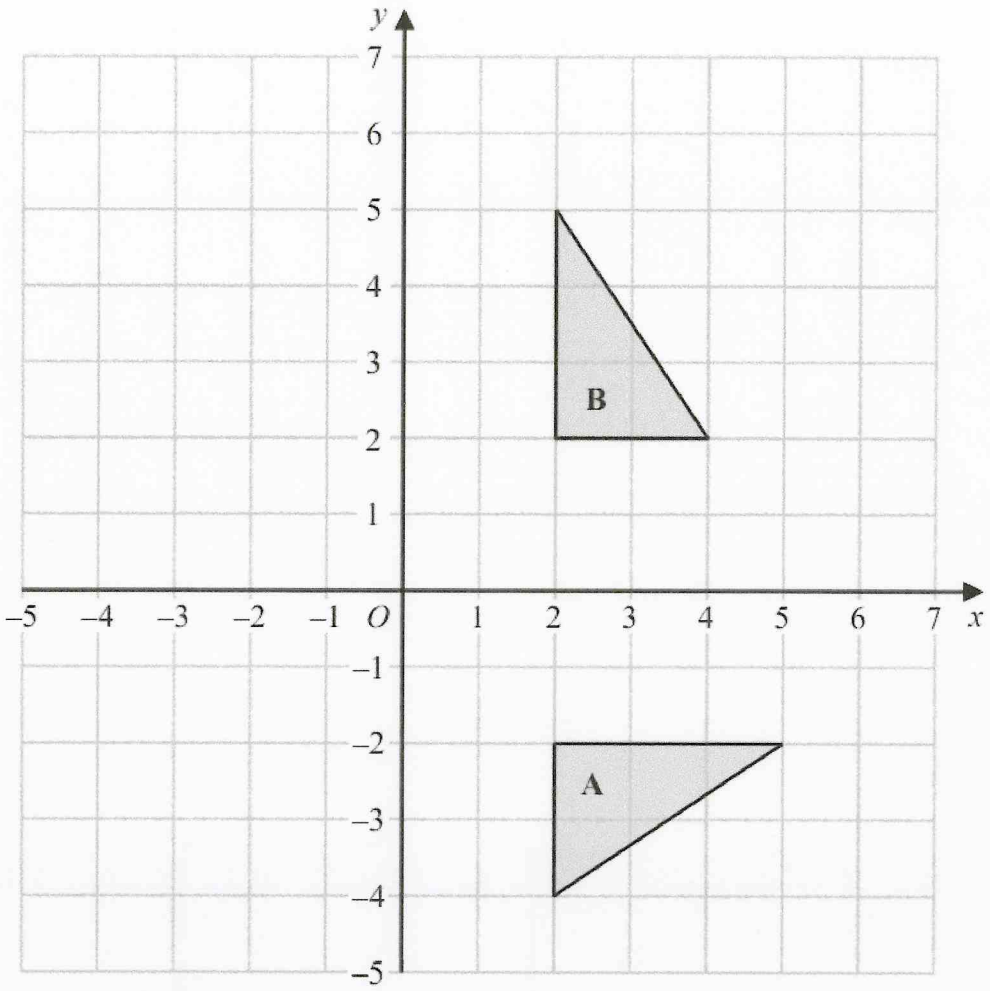


Describe fully the single transformation that maps shape **A** onto shape **B**.

Reflection in the x axis.

(Total for Question 14 is 2 marks)

16

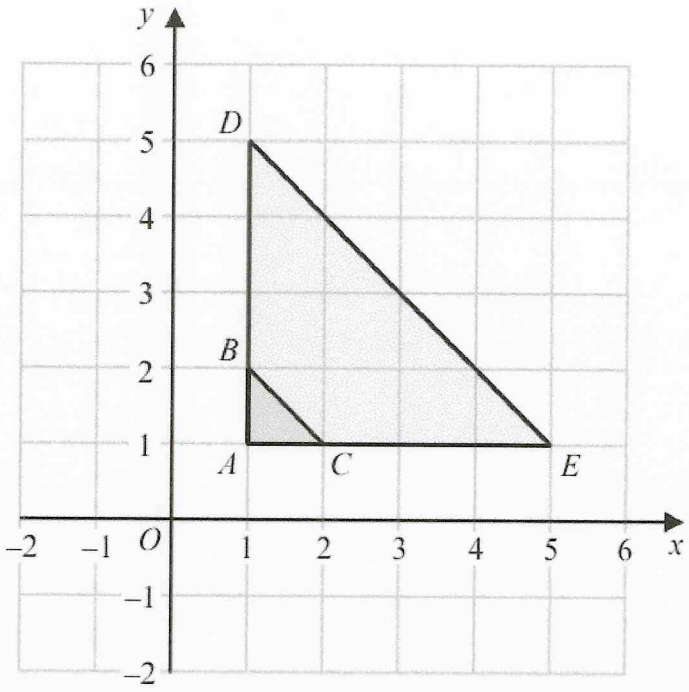


Describe fully the single transformation that maps shape **A** onto shape **B**.

Rotation, 90°, anticlockwise from the centre (0,0)

(Total for Question 16 is 2 marks)

16 Here is a diagram showing triangle ABC and triangle ADE.

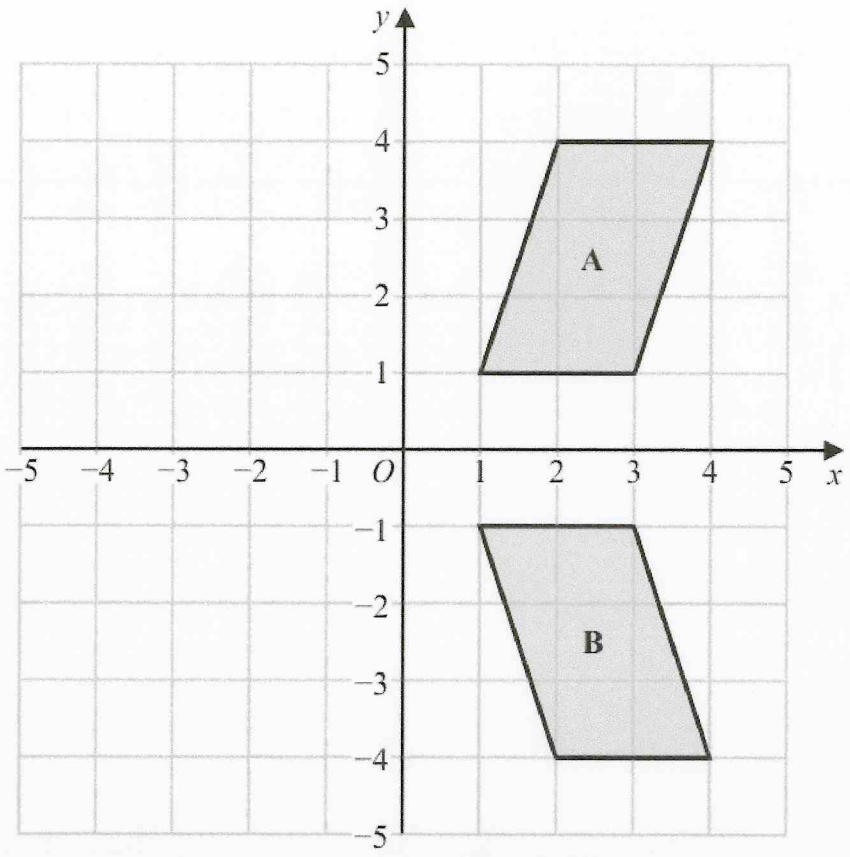


Describe fully the single transformation that maps triangle ABC onto triangle ADE.

Enlargement, scale factor 4
from the centre (1,1)

(Total for Question 16 is 2 marks)

16

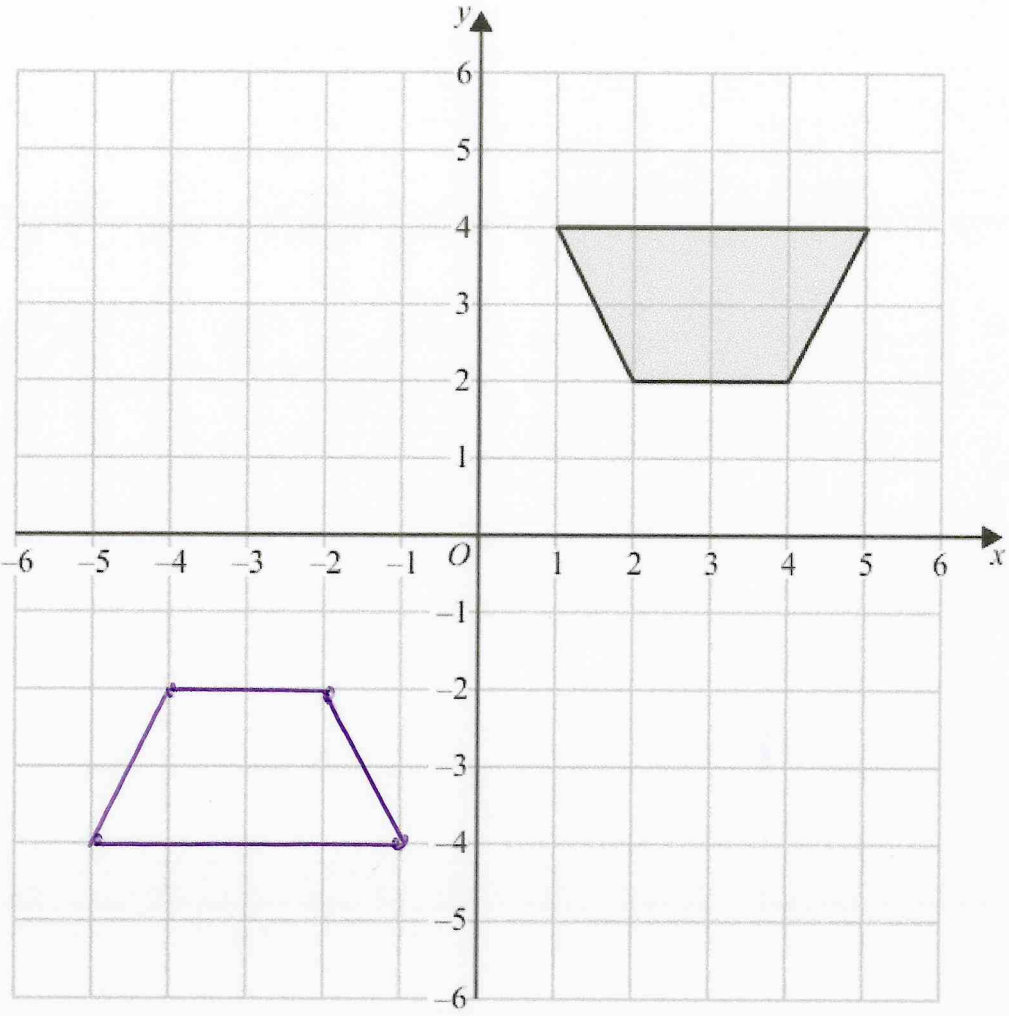


Describe fully the single transformation that maps shape **A** onto shape **B**.

Reflection in the x axis.

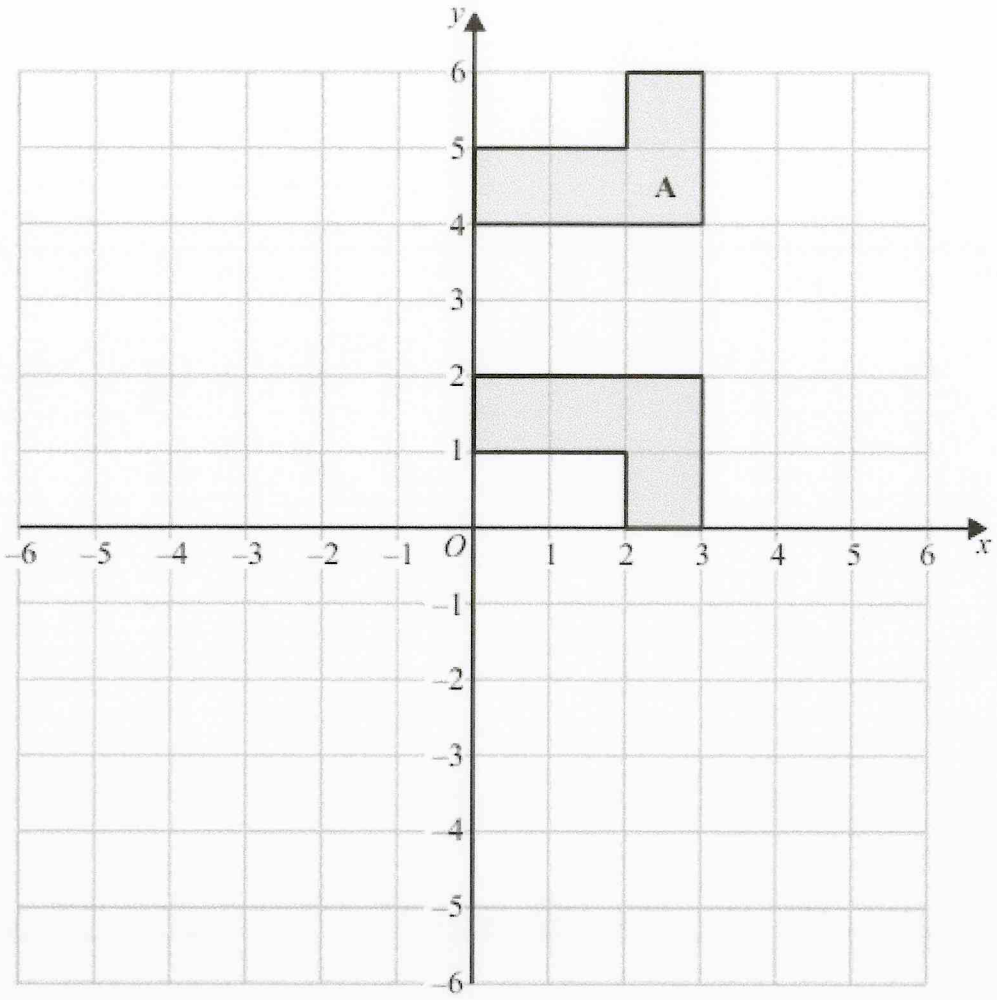
(Total for Question 16 is 2 marks)

18



(a) On the grid above, rotate the shaded shape 180° about (0, 0)

(2)



Mike was asked to

'Reflect shape **A** in the line with equation $x = 3$'

Mike's answer is shown on the grid.
His answer is wrong.

(b) Explain why.

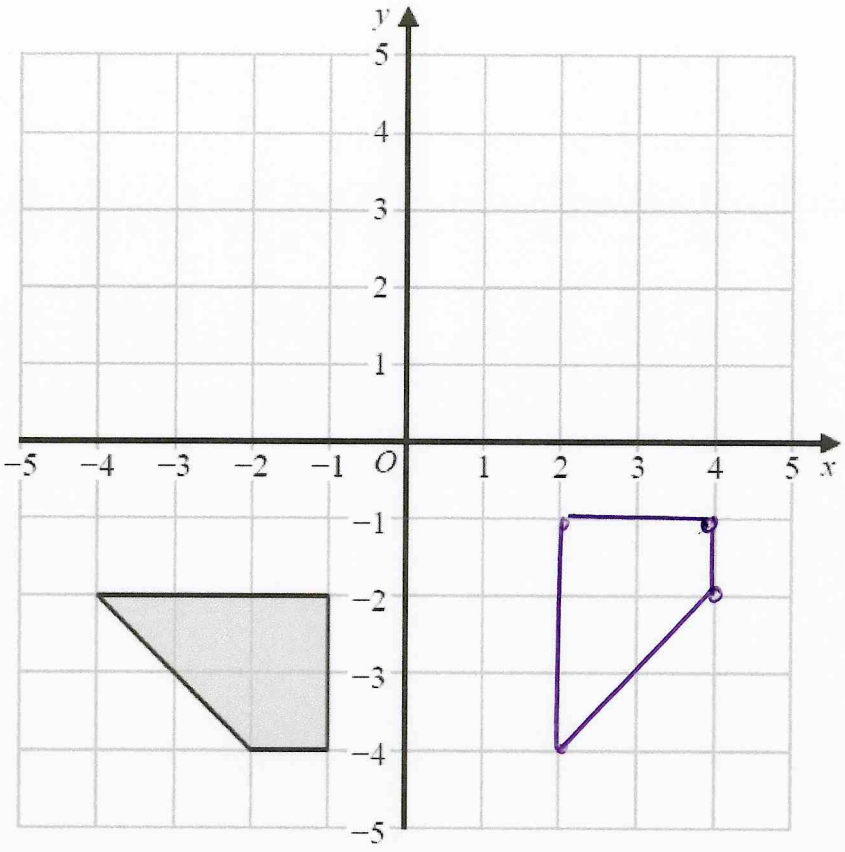
He has used $y = 3$ as the mirror line, instead of $x = 3$.

(1)

June 2024 – Paper 3F

(Total for Question 18 is 3 marks)

18

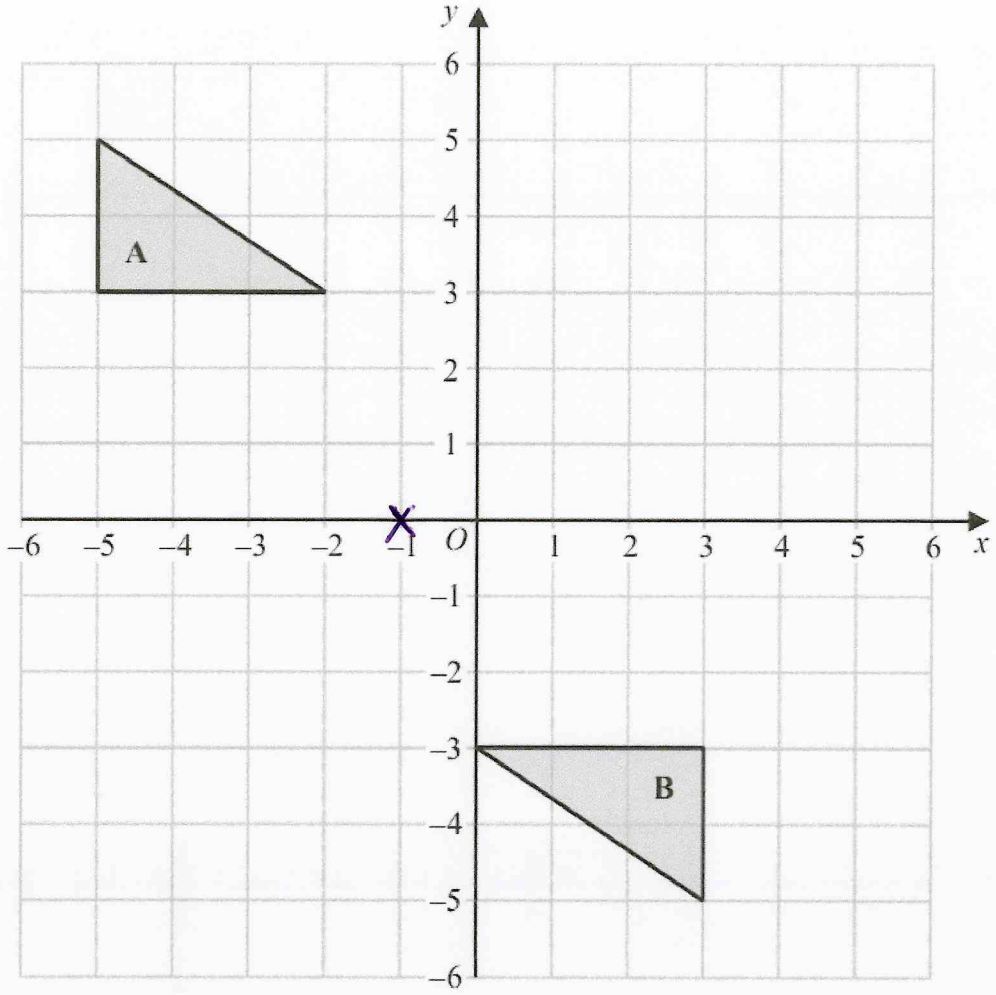


Rotate the shaded shape 90° anticlockwise about (0,0)

November 2022 – 3F

(Total for Question 18 is 2 marks)

18

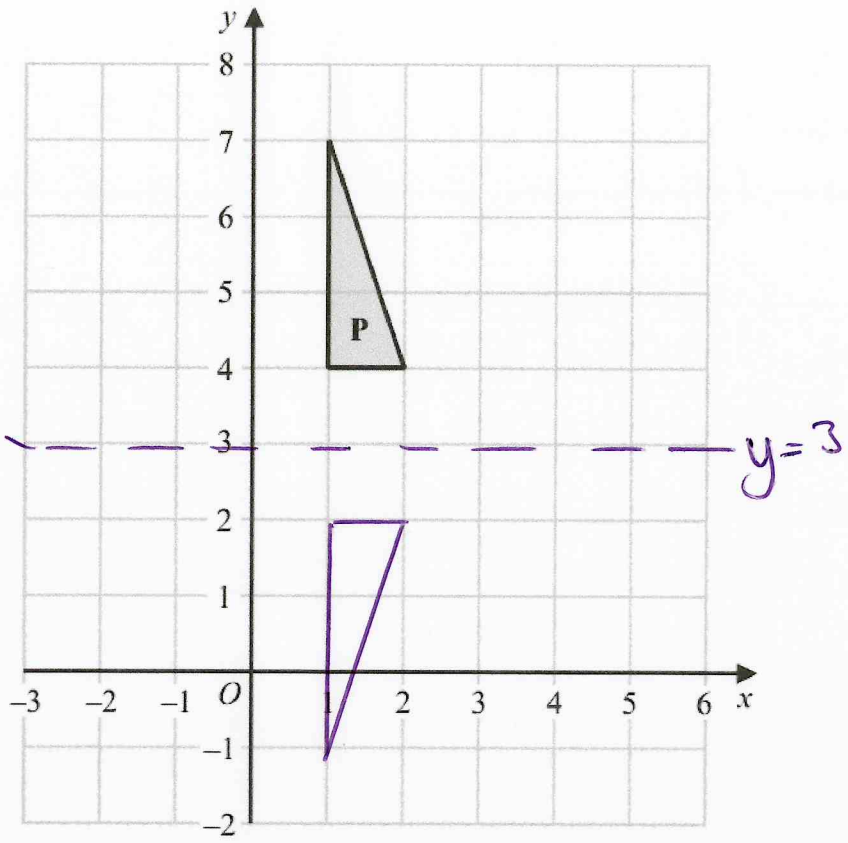


Describe fully the single transformation that maps triangle **A** onto triangle **B**.

Rotation, 180°, around the centre (−1, 0)

(Total for Question 18 is 2 marks)

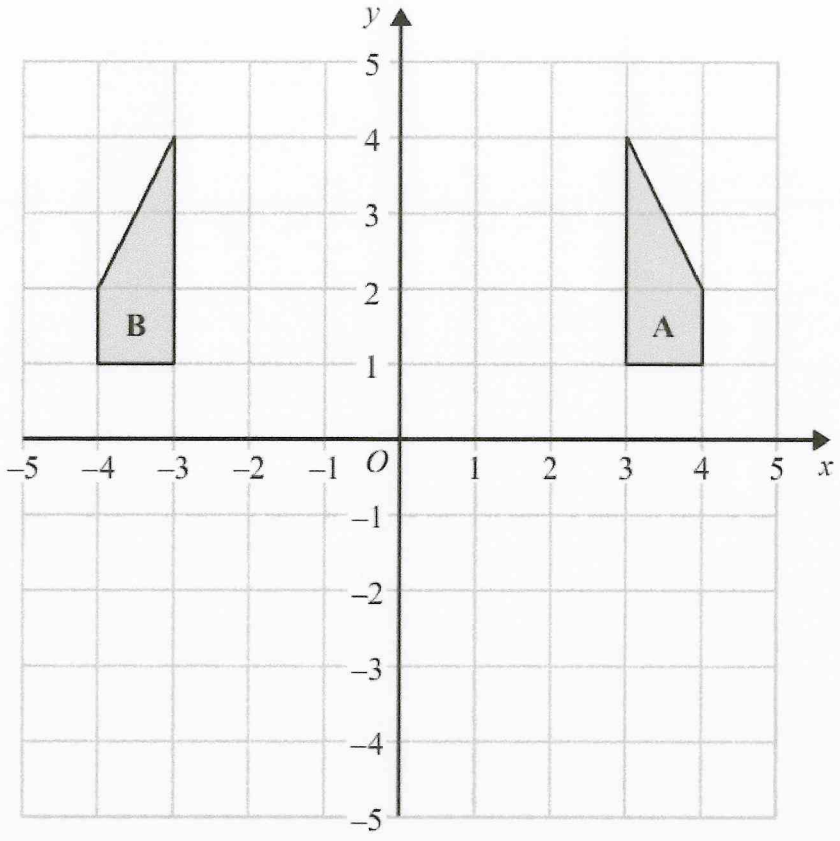
18



Reflect shape **P** in the line $y = 3$

(Total for Question 18 is 2 marks)

18



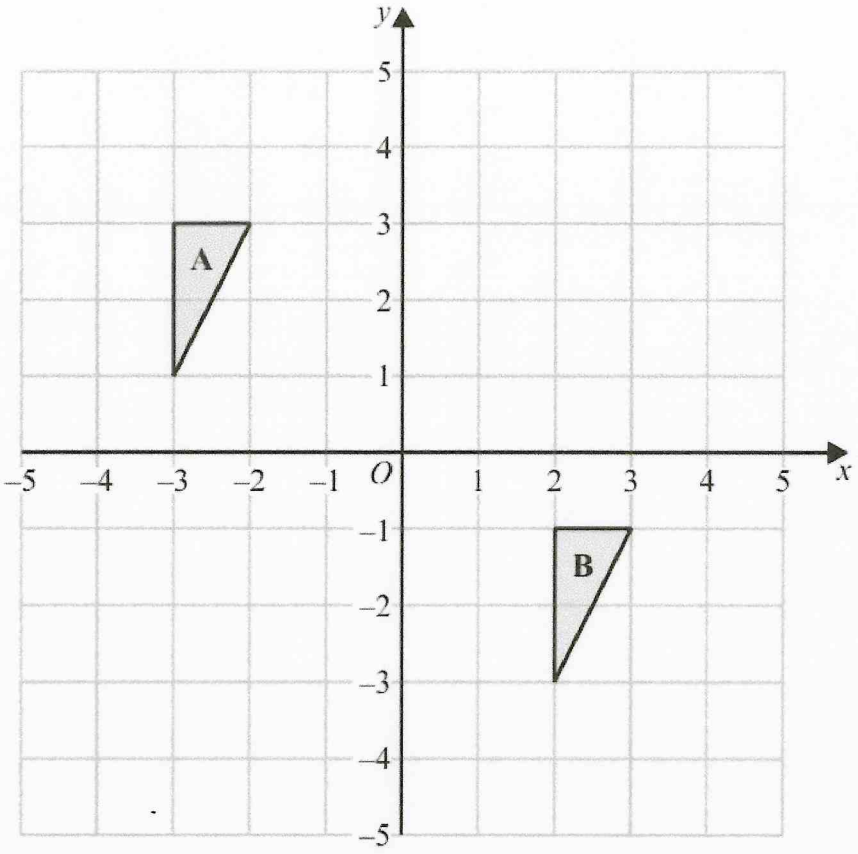
Describe fully the single transformation that maps shape **A** onto shape **B**.

Reflection in the y axis

May 2018 – Paper 2F

(Total for Question 18 is 2 marks)

19

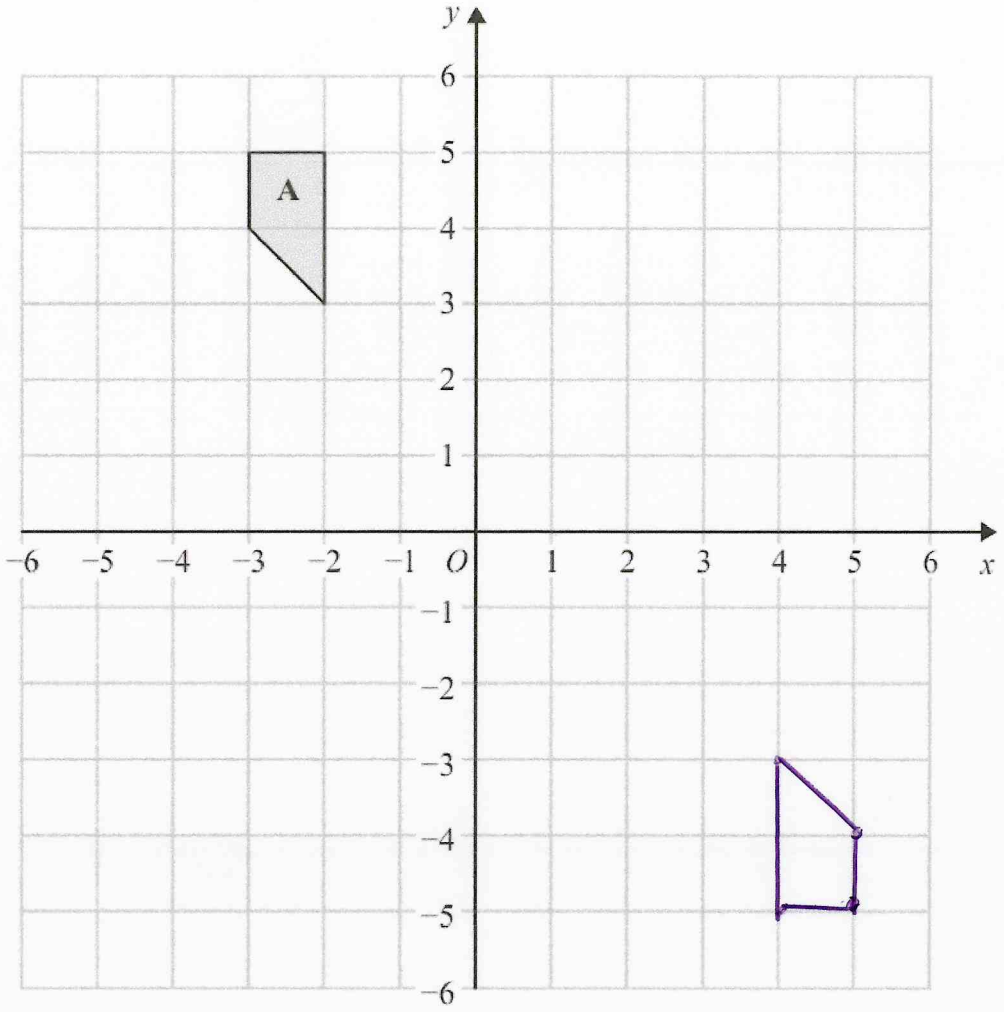


Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

Translation using the vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$

(Total for Question 19 is 2 marks)

19

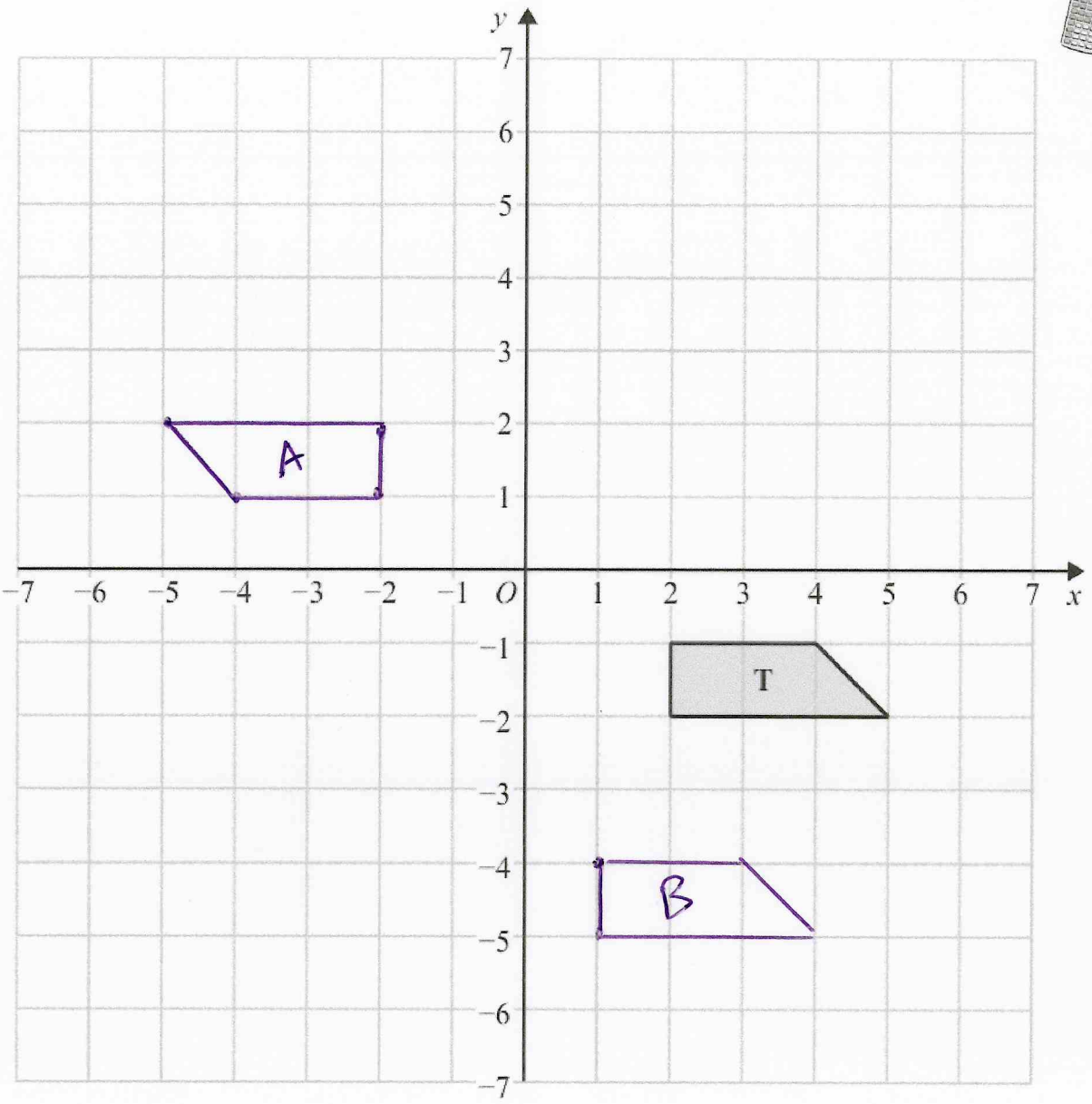


Rotate shape **A** 180° about (1, 0)

November 2018 – Paper 1F

(Total for Question 19 is 2 marks)

20



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

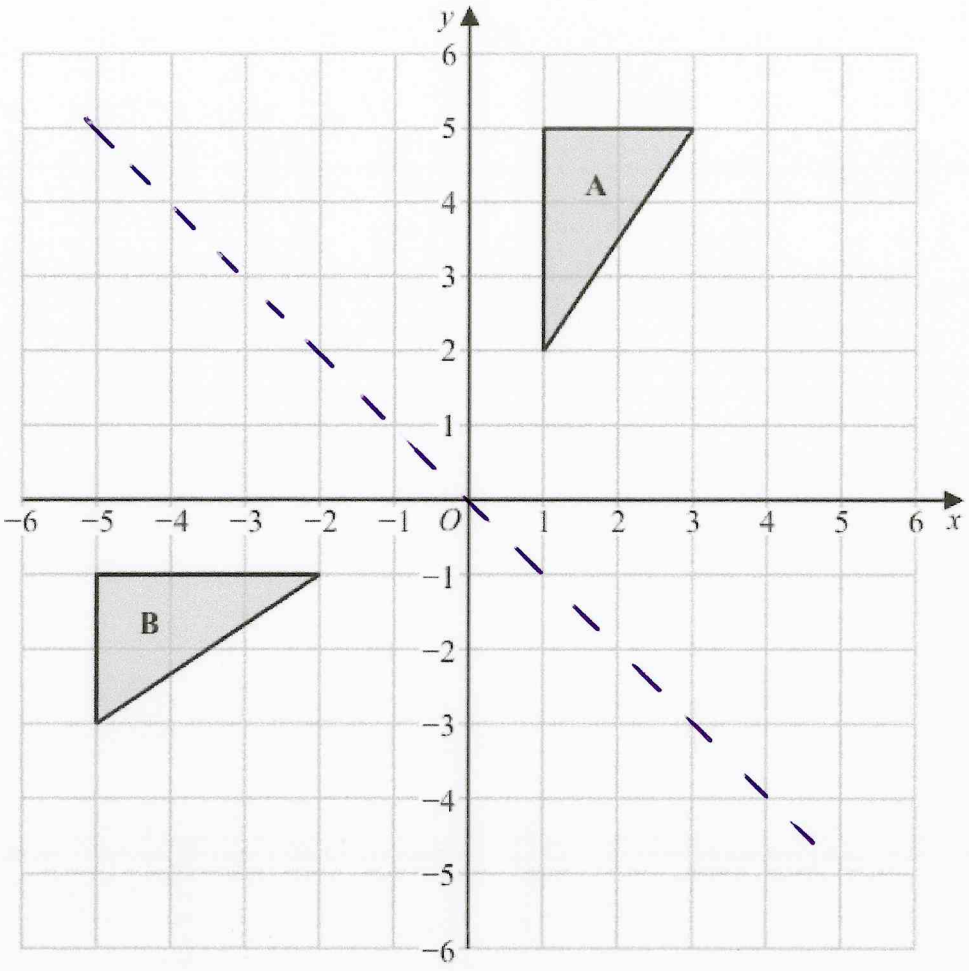
(1)

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

(1)

(Total for Question 20 is 2 marks)

21

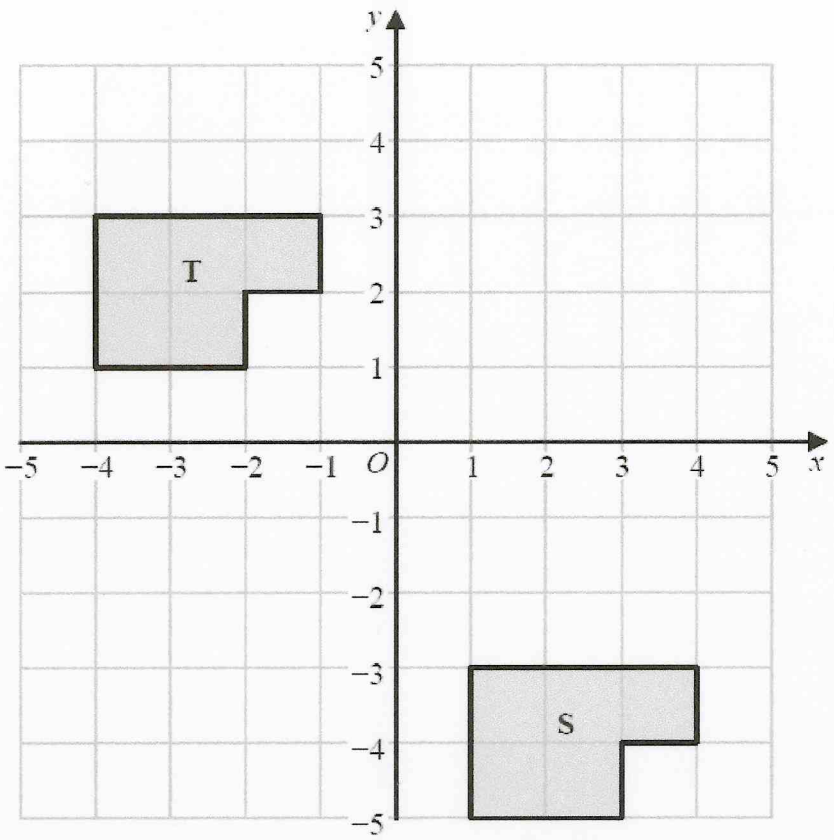


Describe fully the single transformation that maps triangle **A** onto triangle **B**.

Reflection in the line $y = -x$

(Total for Question 21 is 2 marks)

22

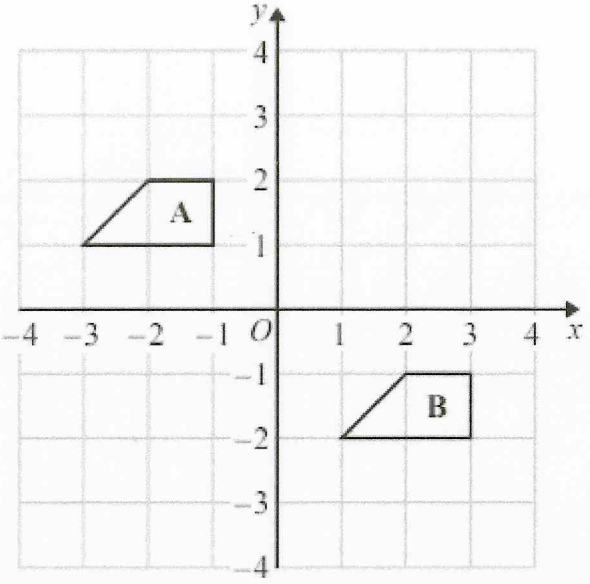


Describe fully the single transformation that maps shape **S** onto shape **T**.

Translation using the vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$

(Total for Question 22 is 2 marks)

22

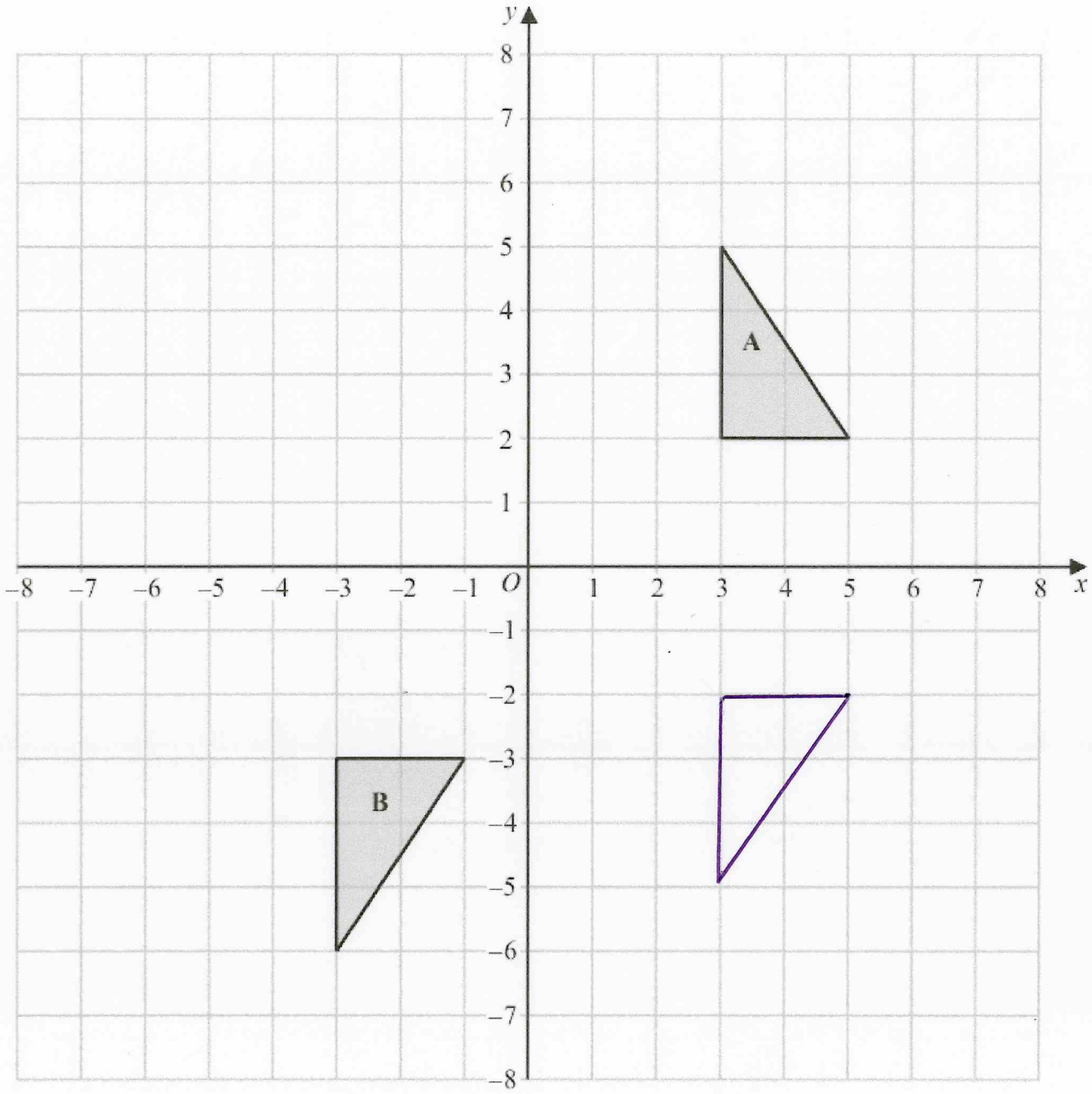


Describe the single transformation that maps shape **A** onto shape **B**.

Translation using the vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

(Total for Question 22 is 2 marks)

26



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

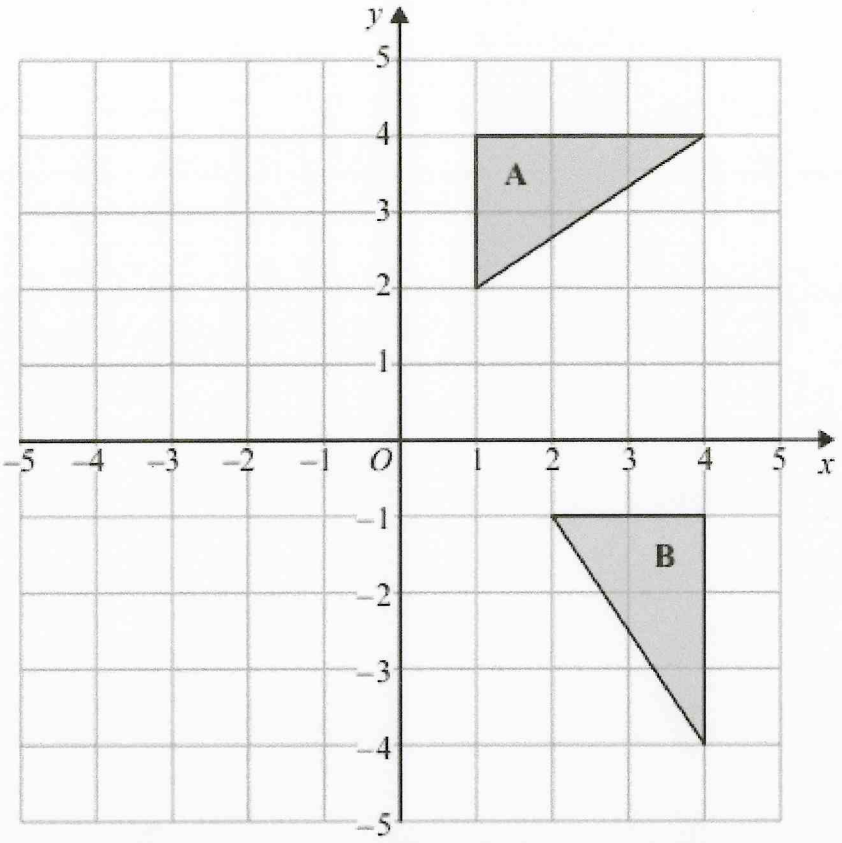
Find the value of c and the value of d.

$c =$ -6

$d =$ -1

(Total for Question 26 is 3 marks)

29



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

Rotation, 90°, clockwise around the centre (0,0)

(Total for Question 29 is 2 marks)