Name	Class

MATHS TEACHER HUB

www.MathsTeacherHub.com

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

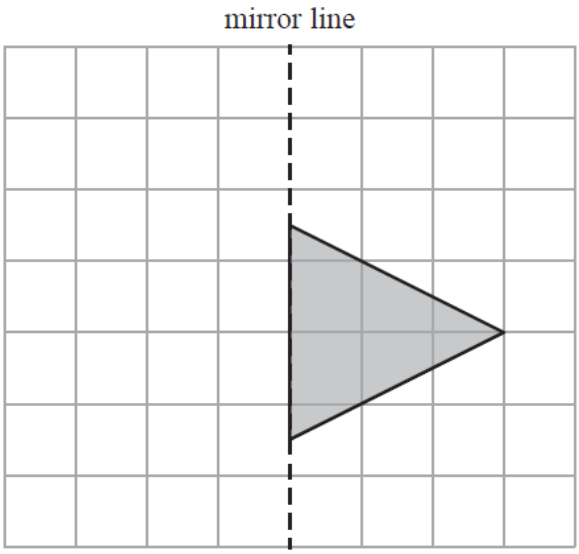
•The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question*.

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.

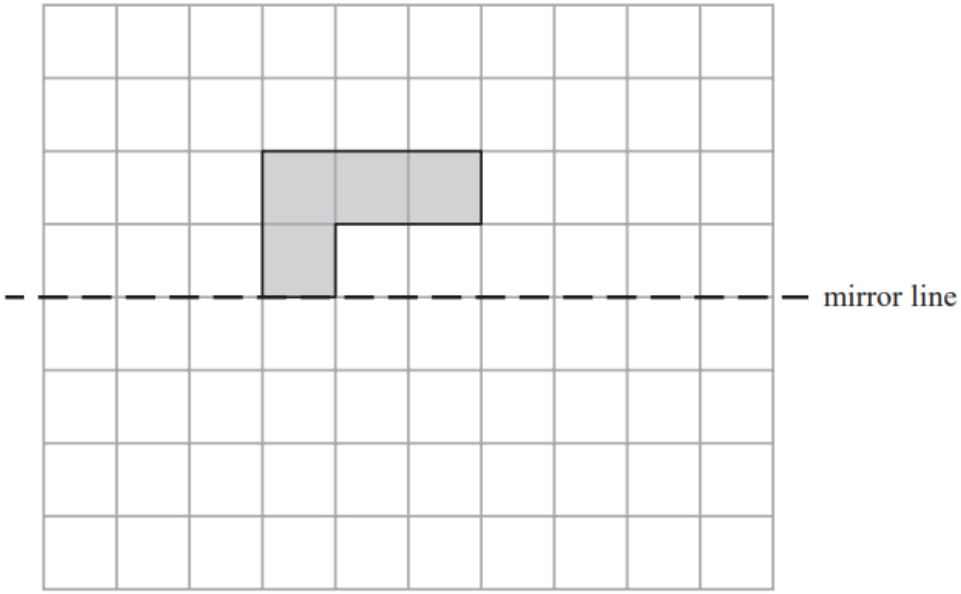
Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

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



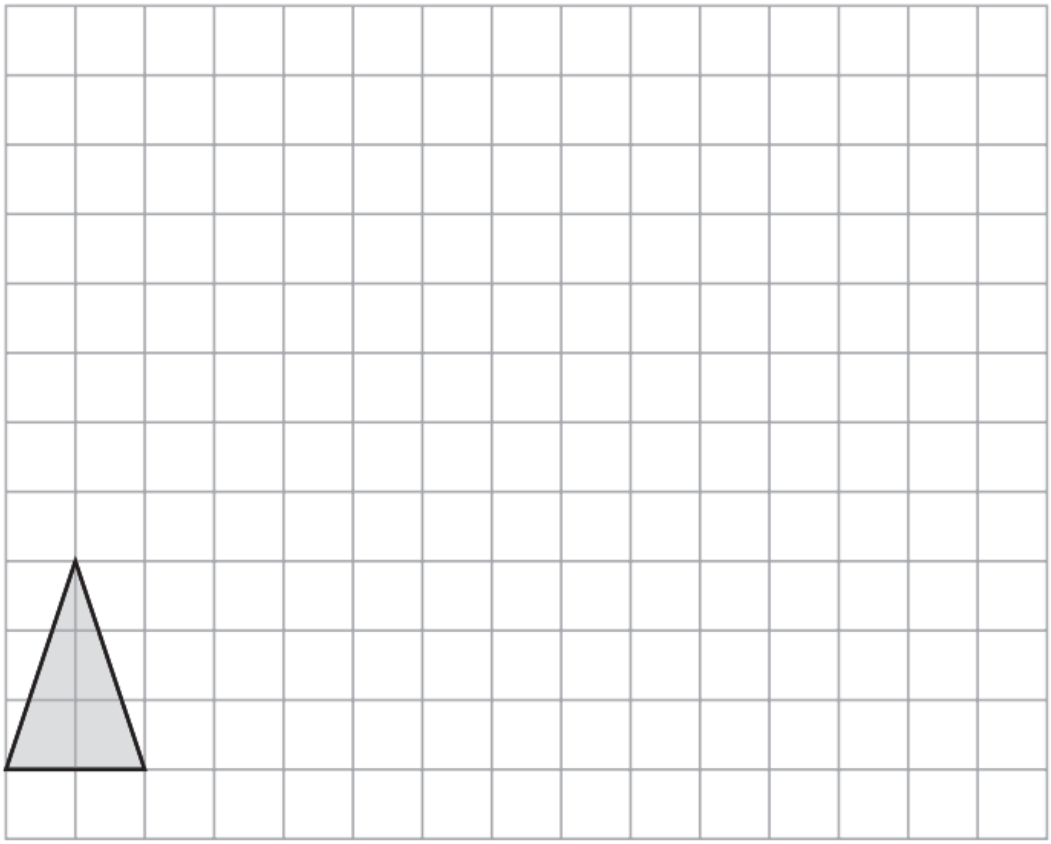
June 2022 – Paper 1F **(Total for Question 3 is 1 mark)**

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



November 2018 – Paper 3F **(Total for Question 10 is 1 mark)**

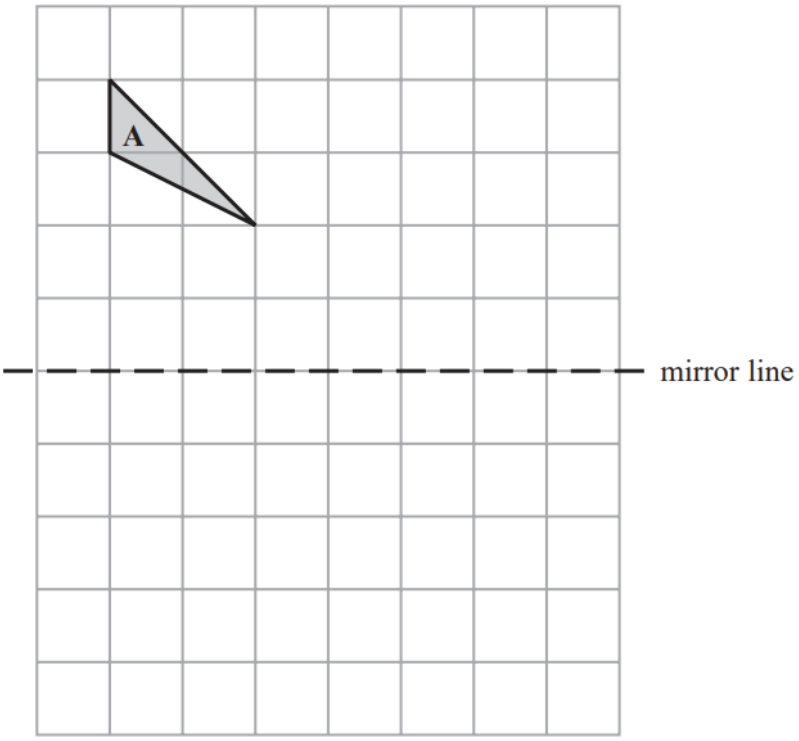
11



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

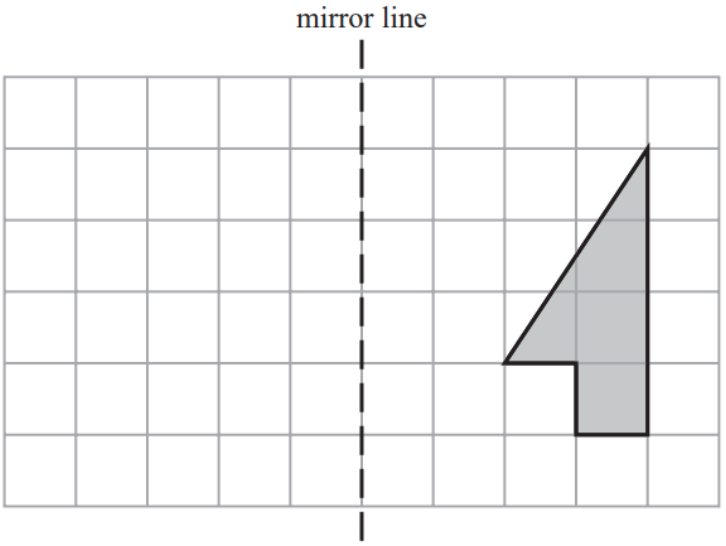
(Total for Question 11 is 2 marks)

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



November 2021 – Paper 1F **(Total for Question 11 is 2 marks)**

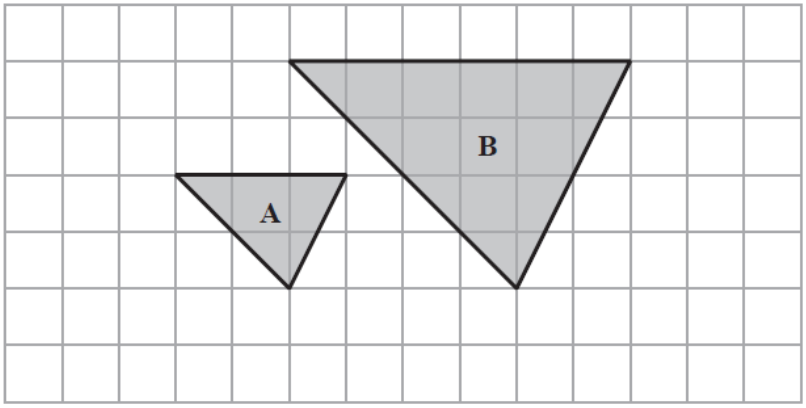
11



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.

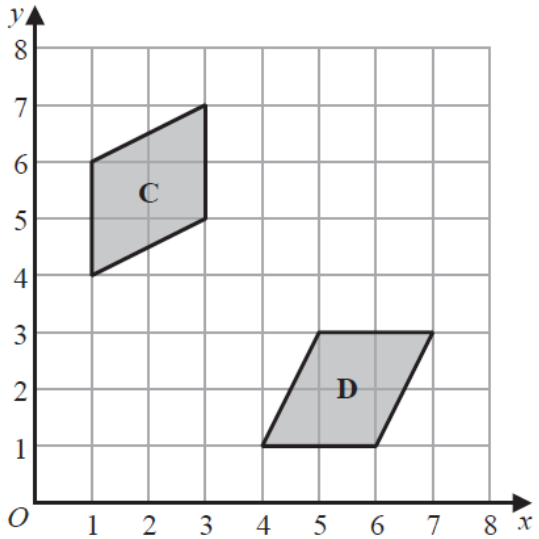
.....

(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.

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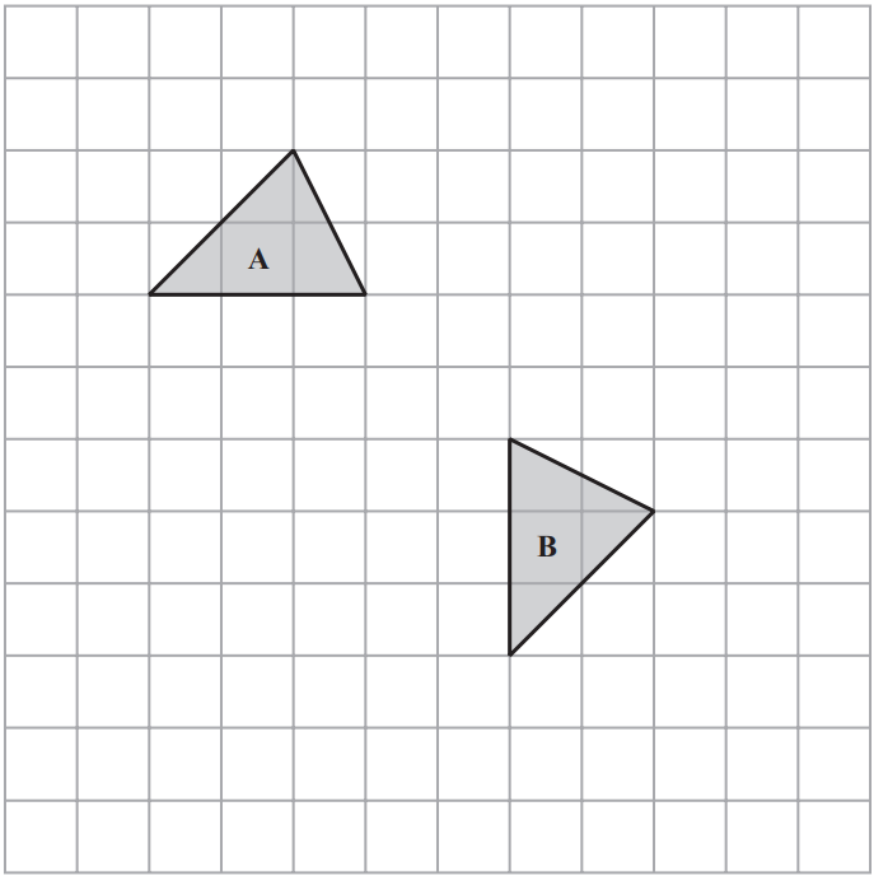
(1)

(Total for Question 11 is 4 marks)

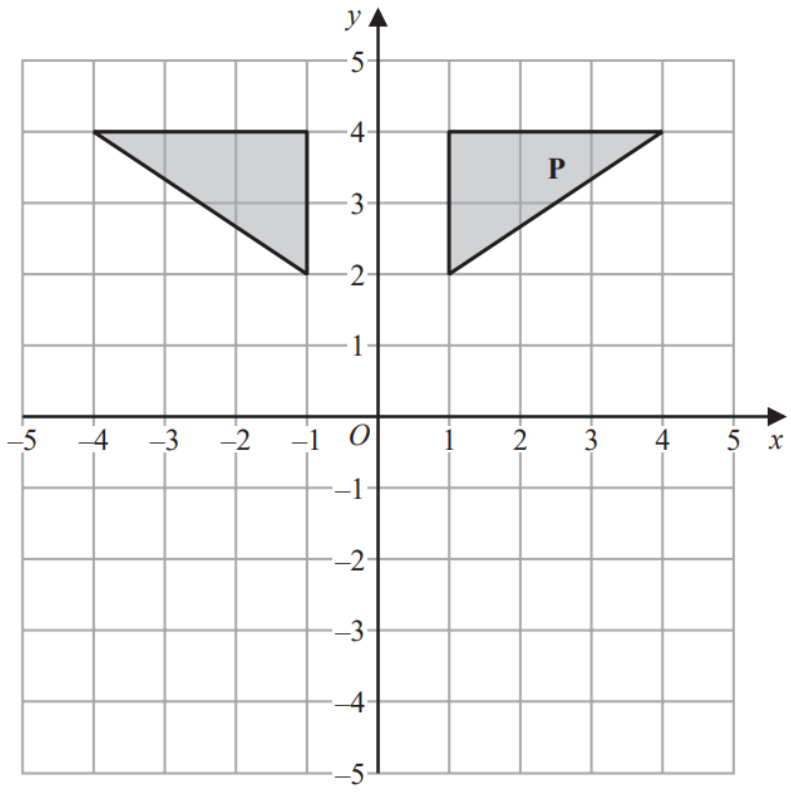
12 Shape **A** is reflected in a mirror line to give shape **B**.



(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.

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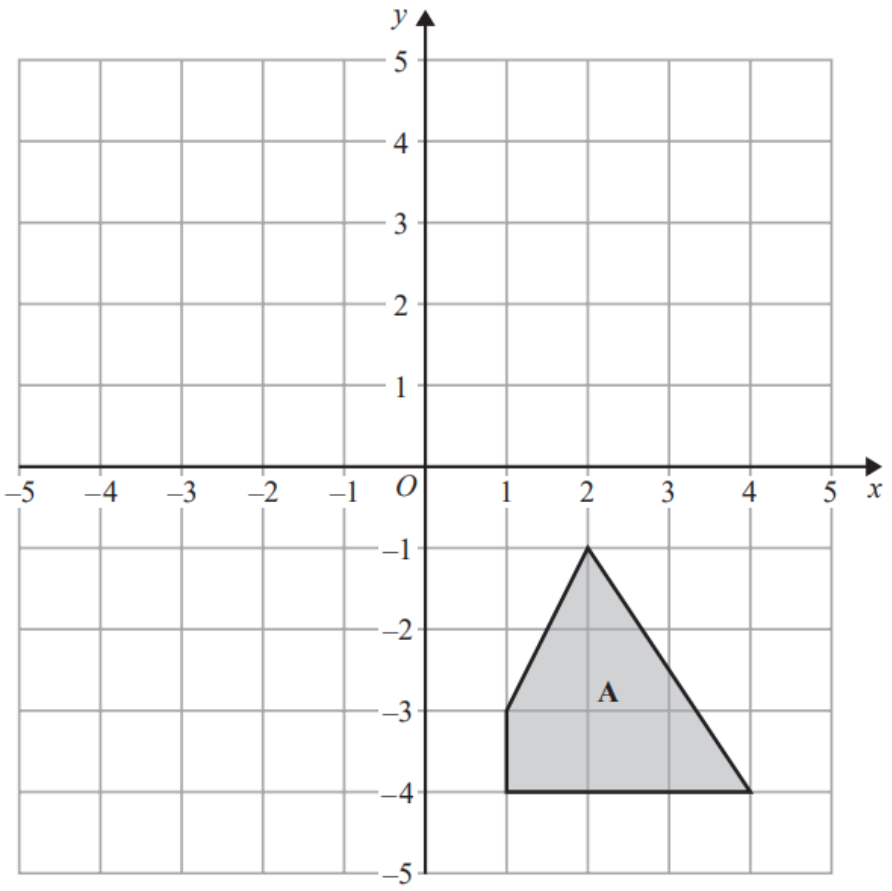
(1)

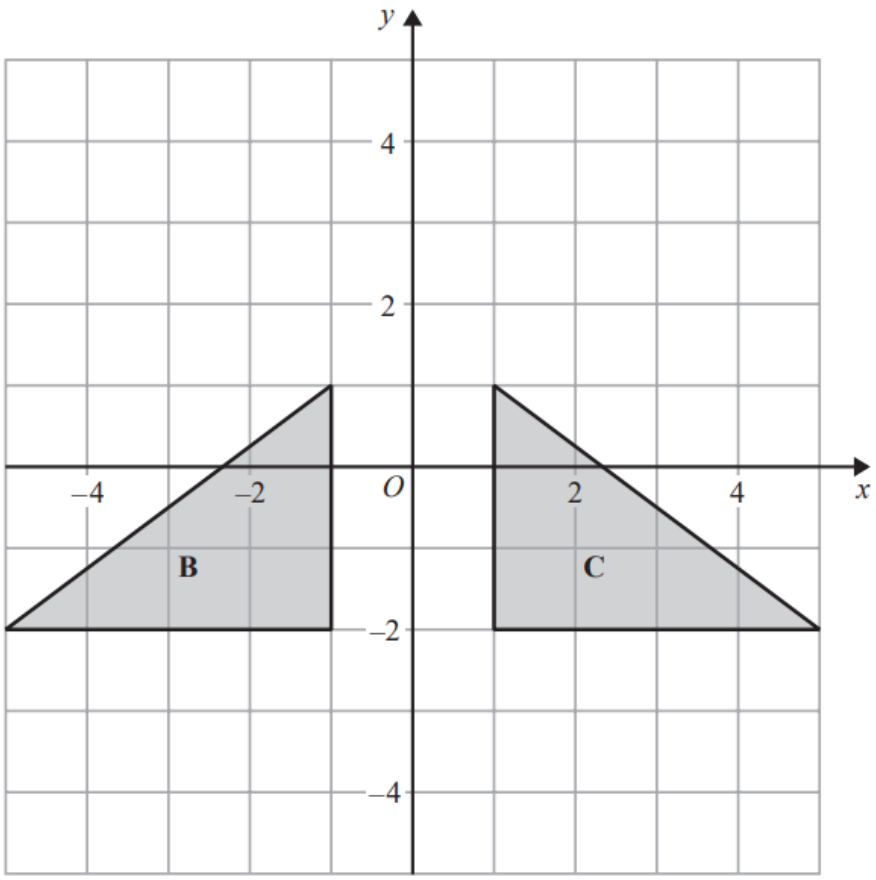
(Total for Question 12 is 2 marks)

13



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

(2)



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

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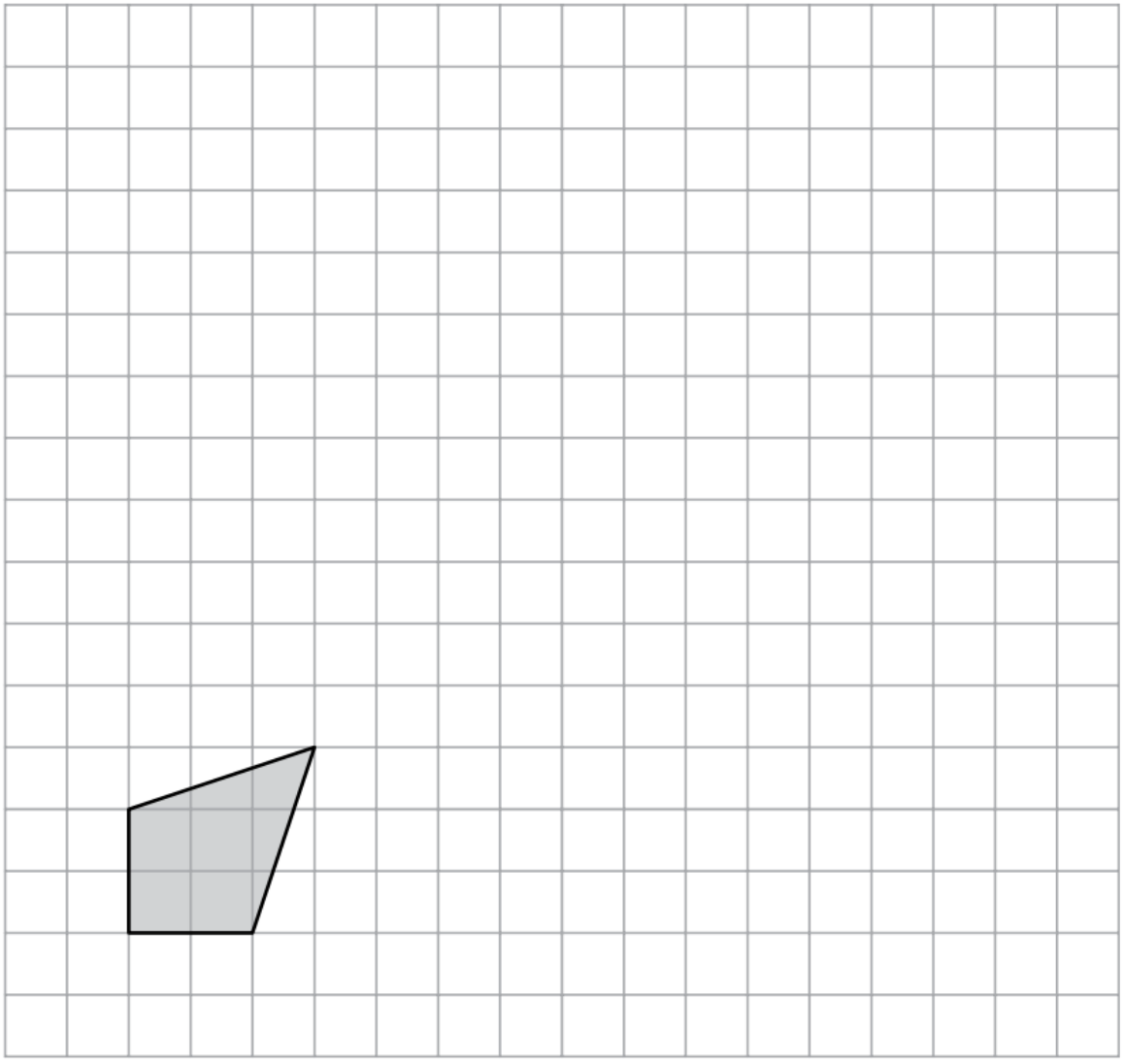
.....

(2)

June 2017 – Paper 2F **(Total for Question 13 is 4 marks)**

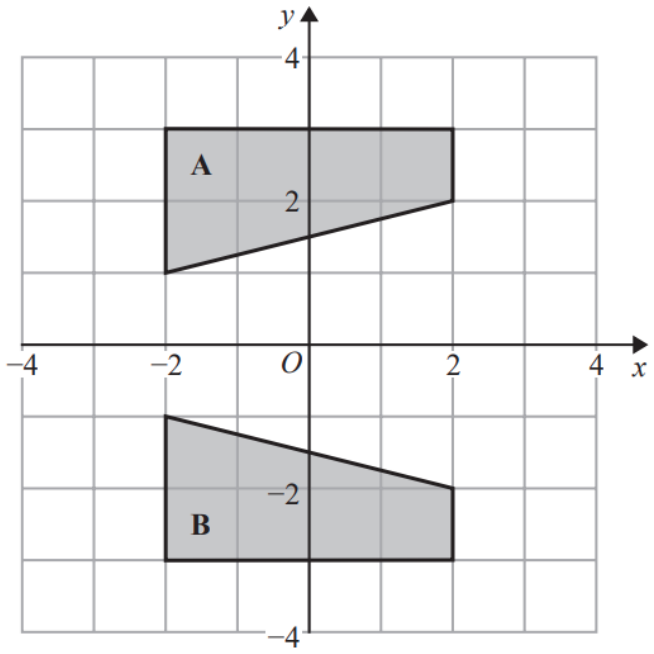
13



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**.

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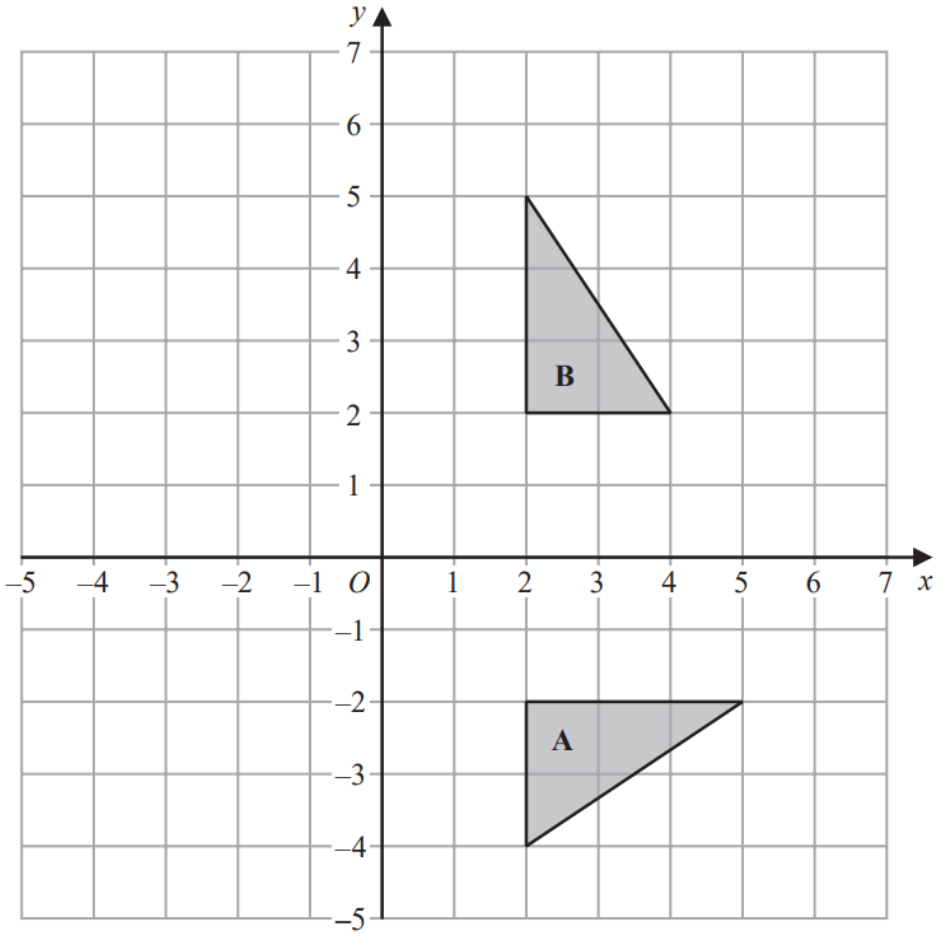
November 2017 – Paper 3F **(Total for Question 14 is 2 marks)**

16



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

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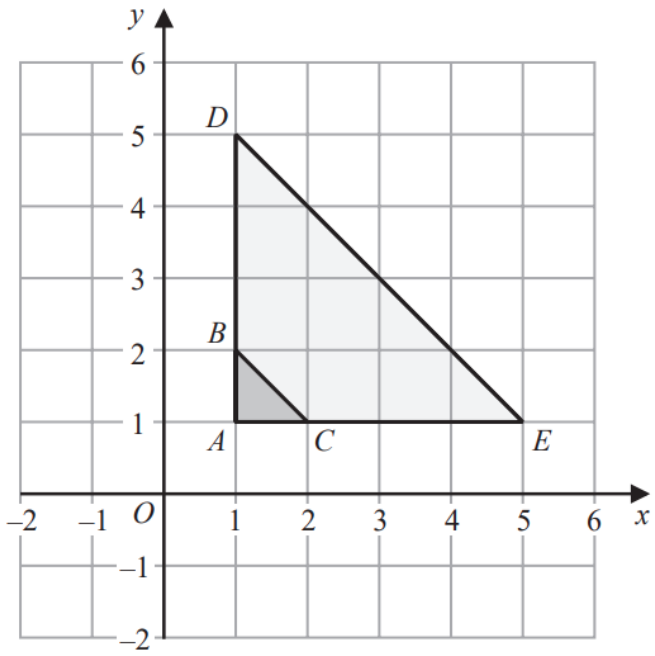
(Total for Question 16 is 2 marks)

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



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

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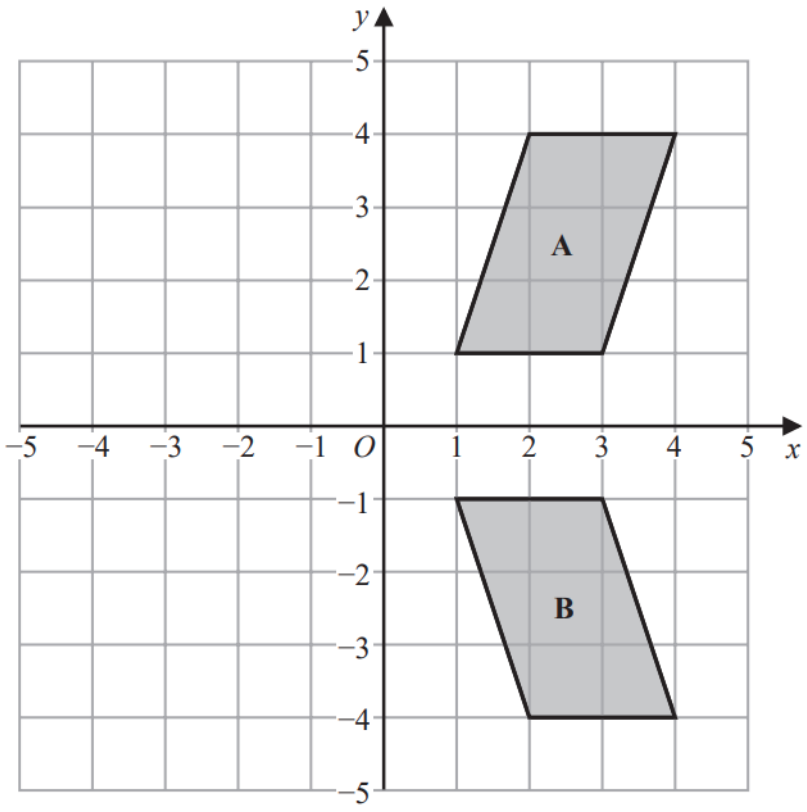
November 2021 – Paper 3F **(Total for Question 16 is 2 marks)**

16



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

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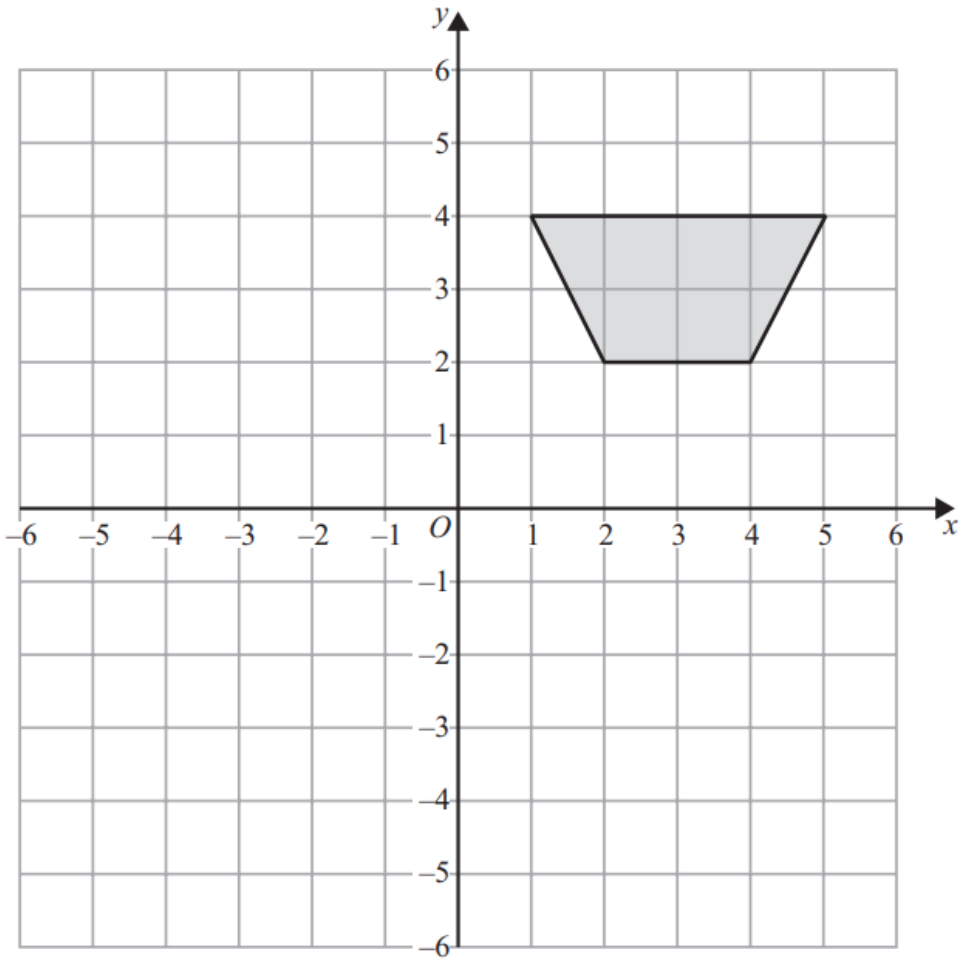
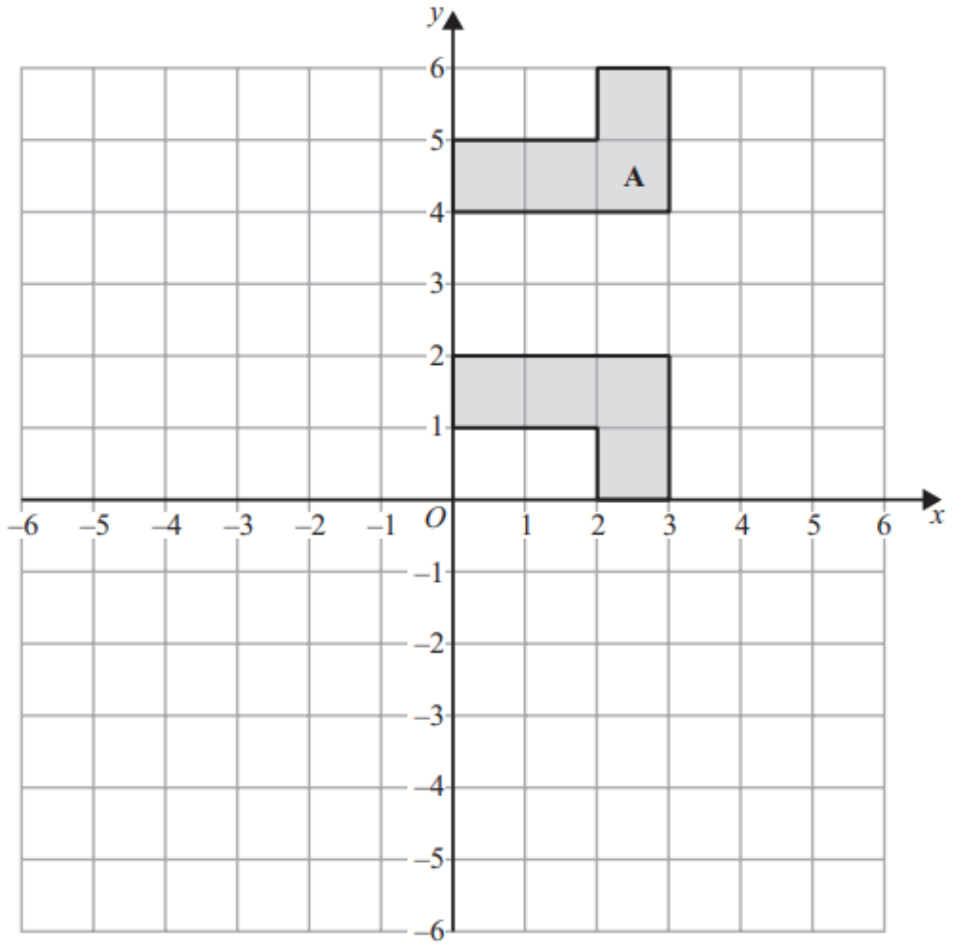
 (Total for Question 16 is 2 marks)

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.

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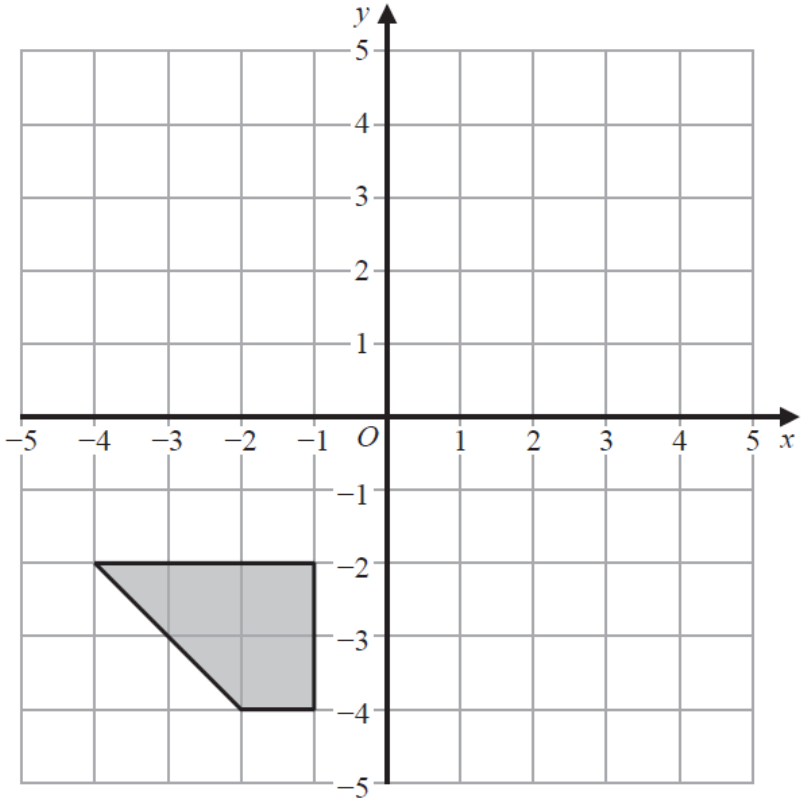
(1)

June 2024 – Paper 3F **(Total for Question 18 is 3 marks)**

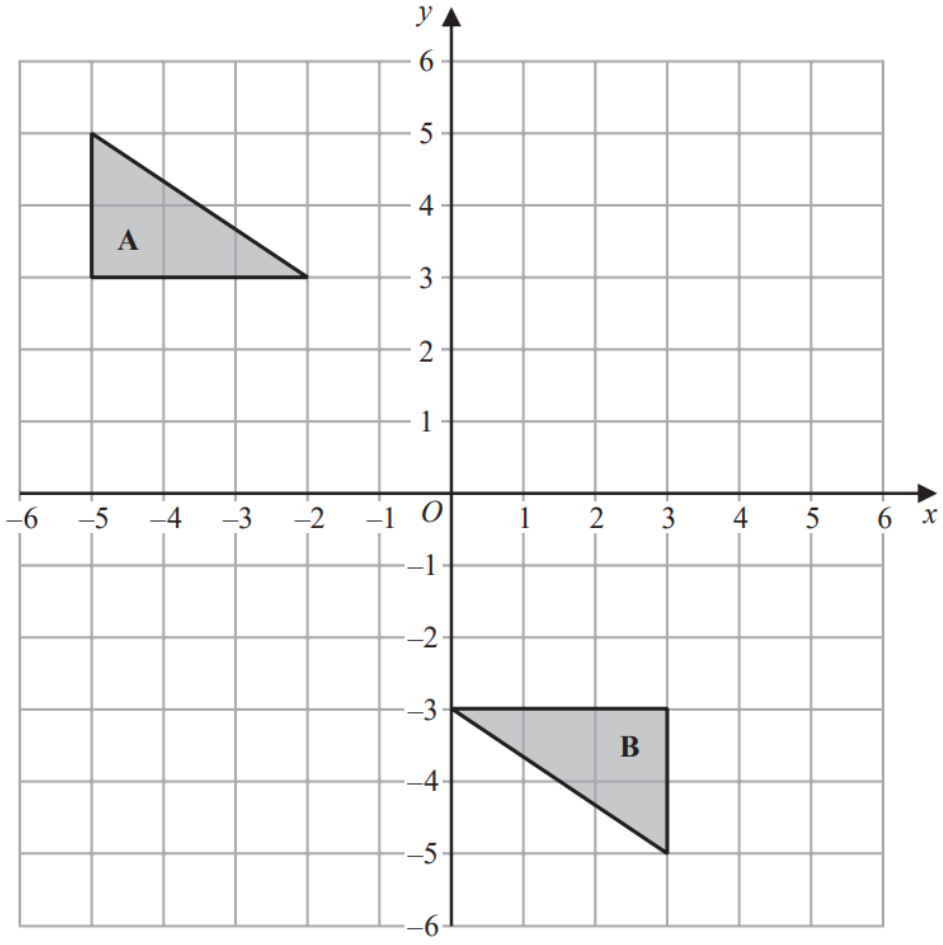
18



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**.

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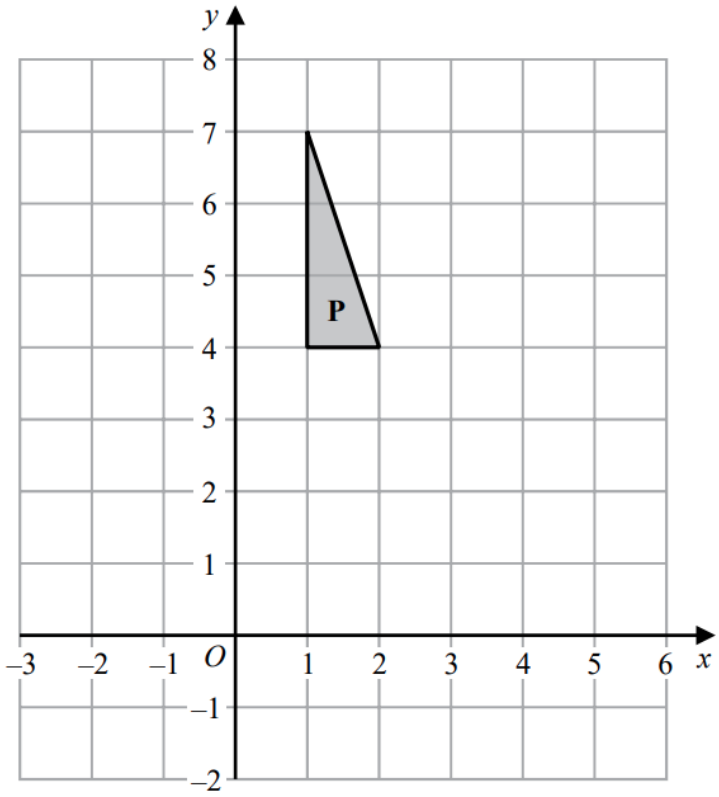
May 2020 – Paper 2F **(Total for Question 18 is 2 marks)**

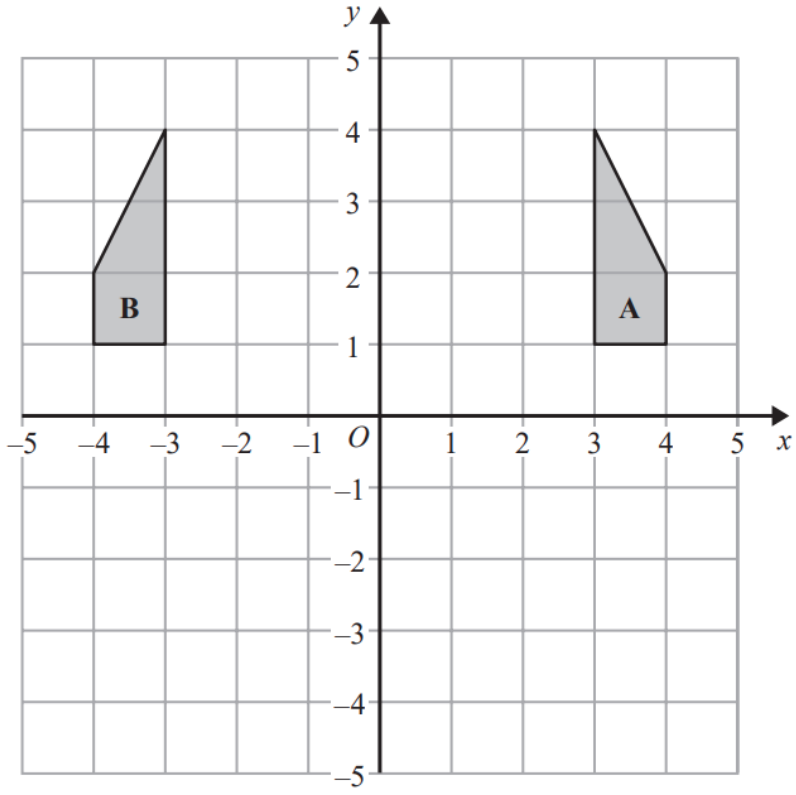
18



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

November 2019 – Paper 3F **(Total for Question 18 is 2 marks)**

18



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

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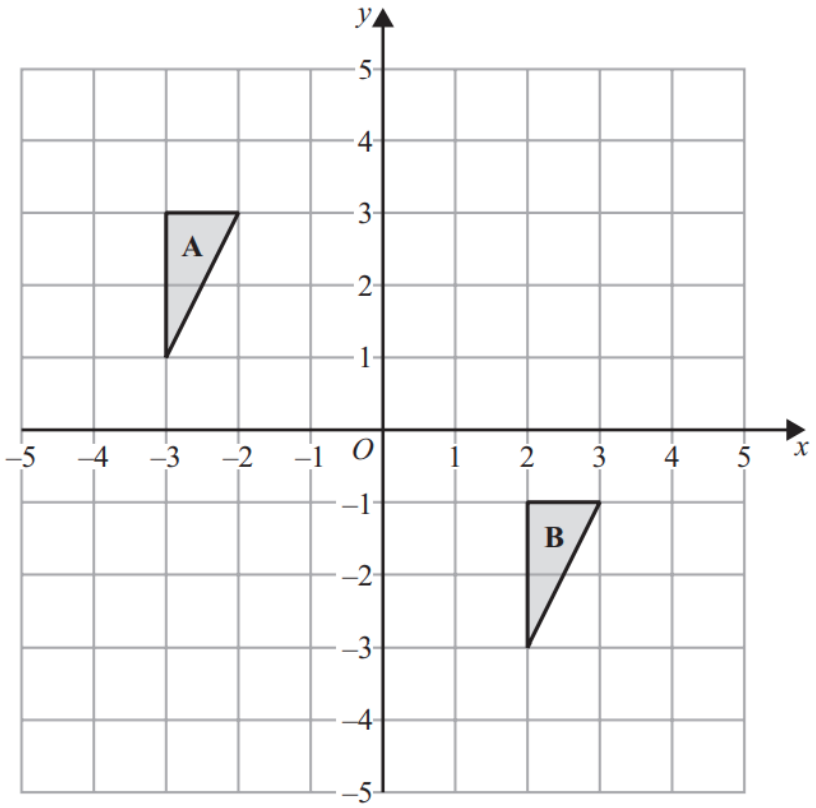
May 2018 – Paper 2F **(Total for Question 18 is 2 marks)**

19



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

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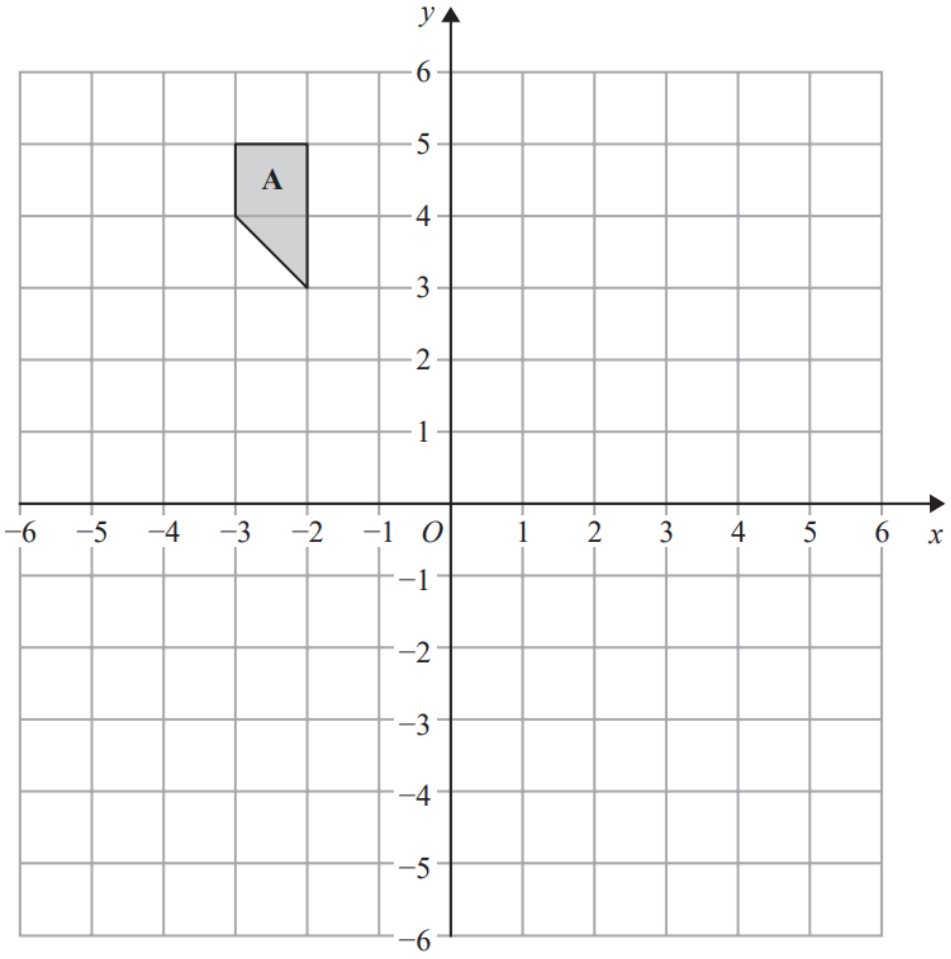
May 2024 – Paper 1F **(Total for Question 19 is 2 marks)**

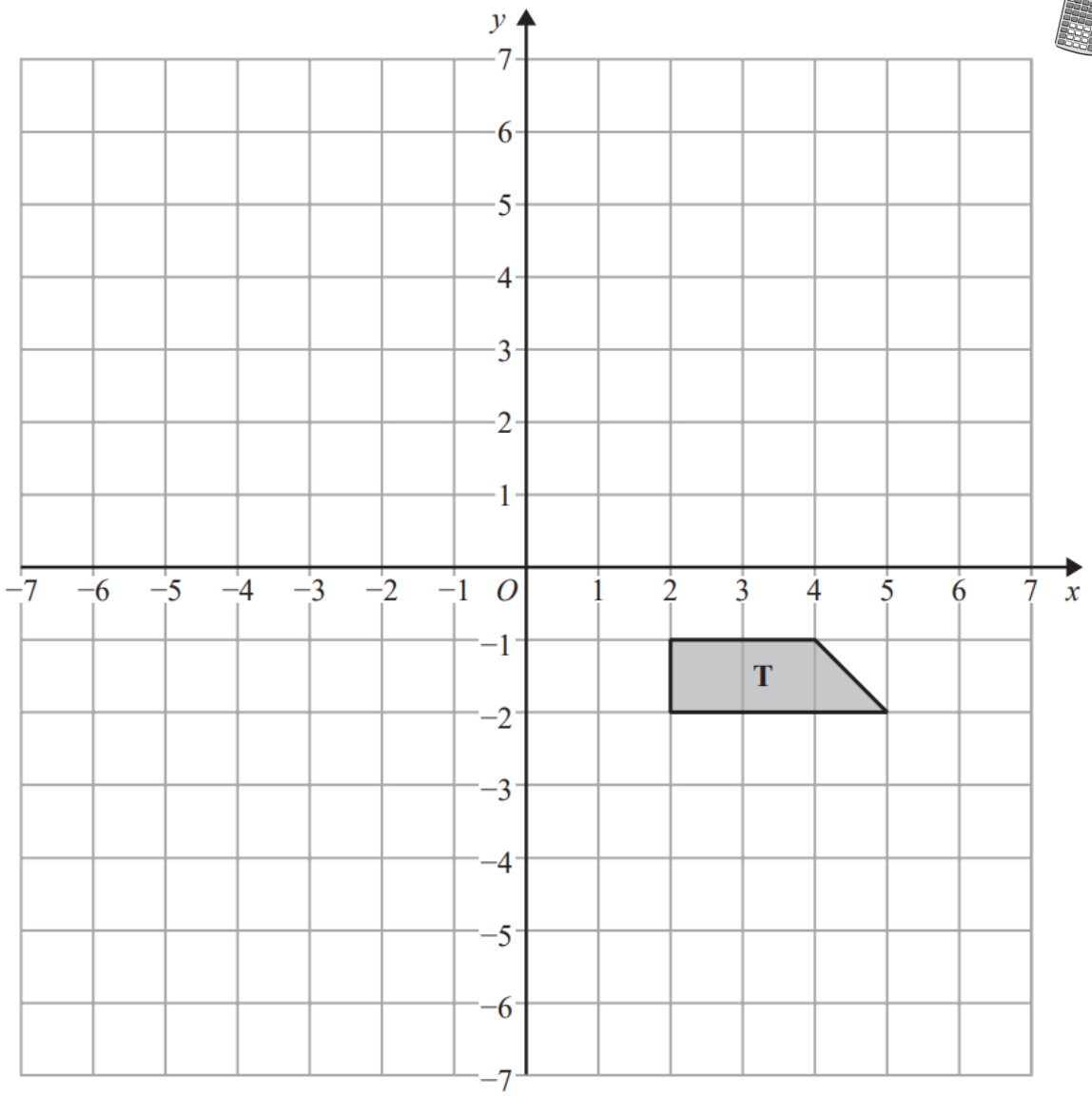
19



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**.

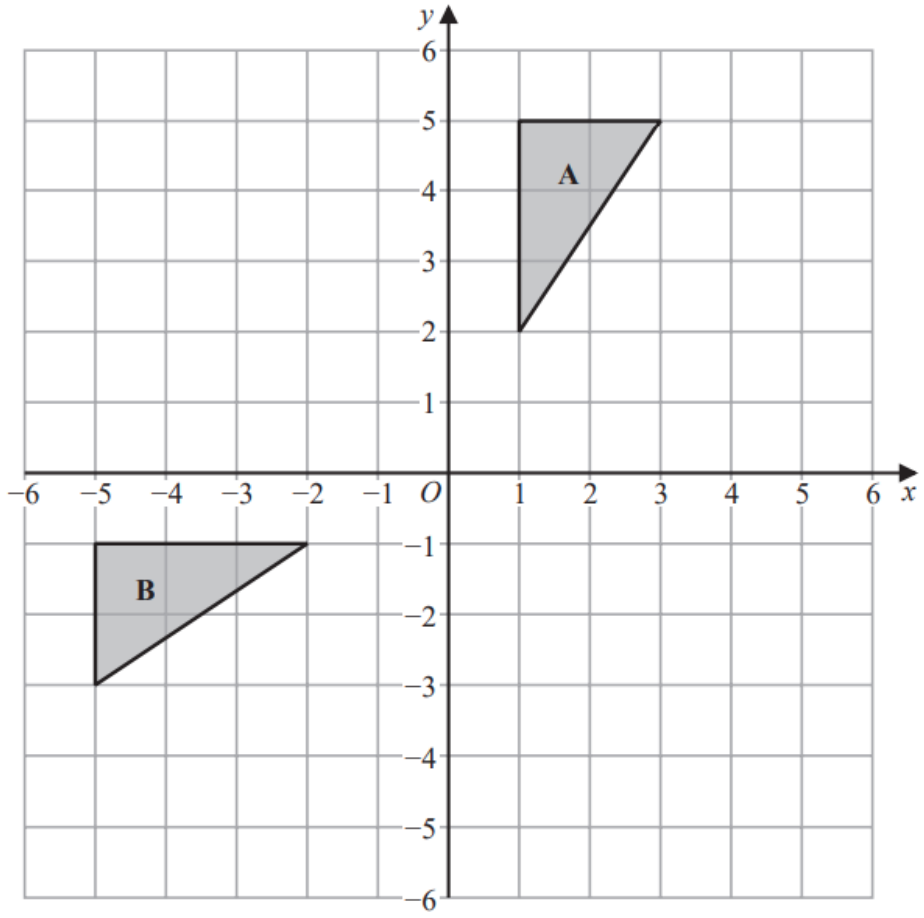
(1)

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

(1)

November 2017 – Paper 2F **(Total for Question 20 is 2 marks)**

21



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

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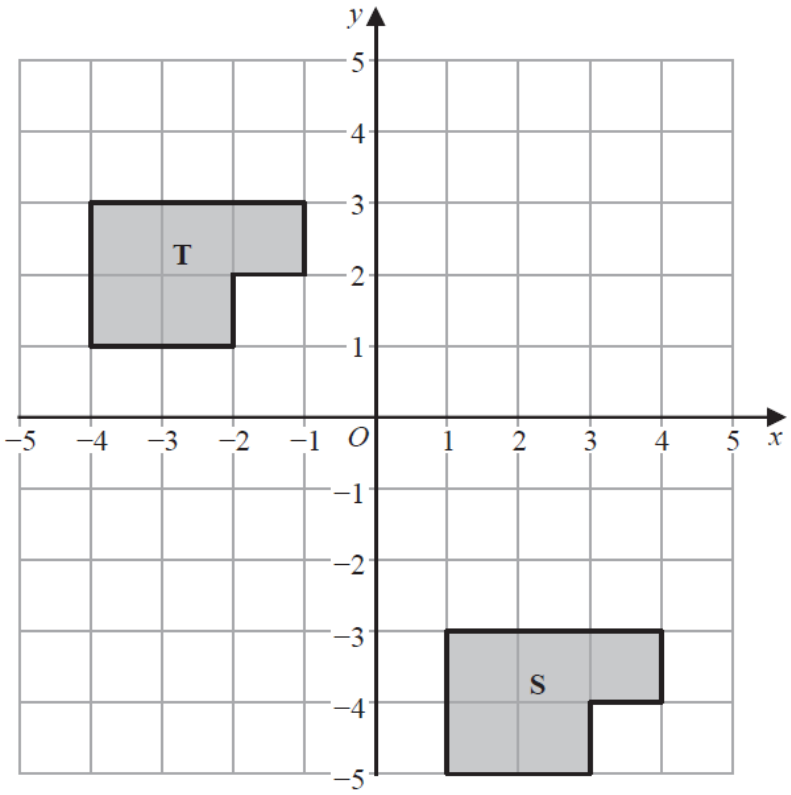
(Total for Question 21 is 2 marks)

22



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

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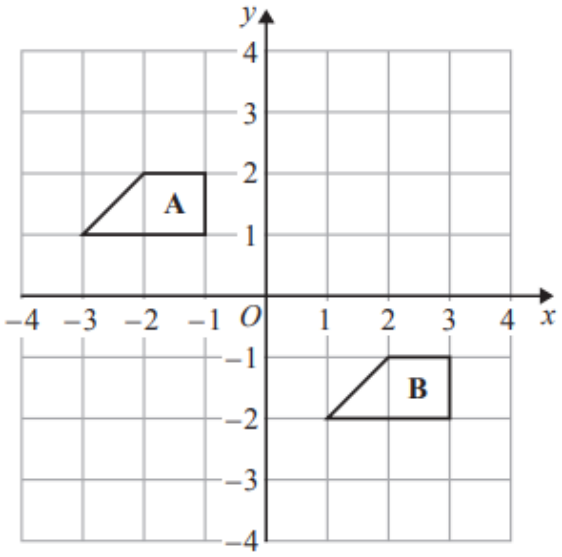
June 2022 – Paper 2F **(Total for Question 22 is 2 marks)**

22



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

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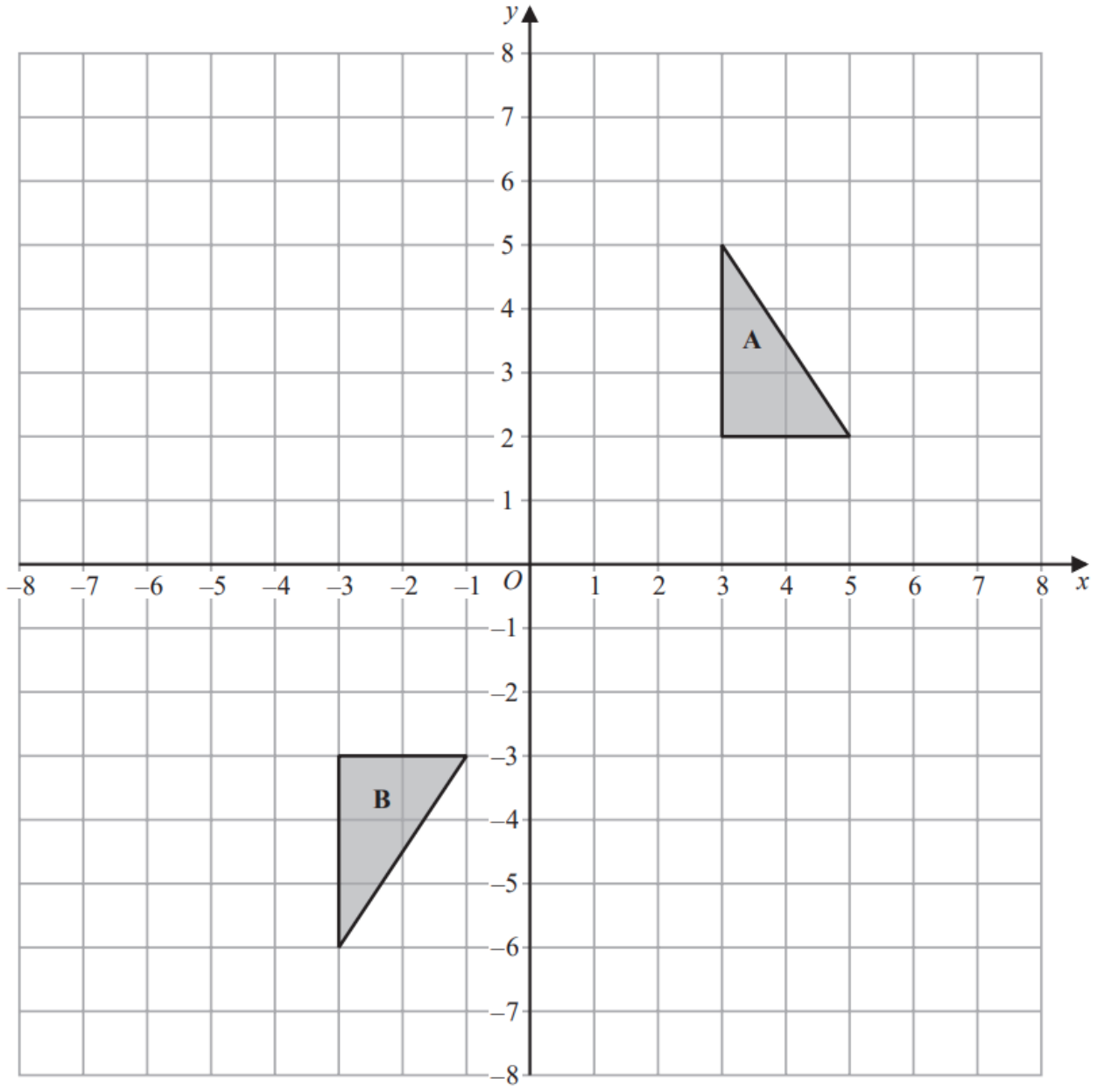
(Total for Question 22 is 2 marks)

26



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

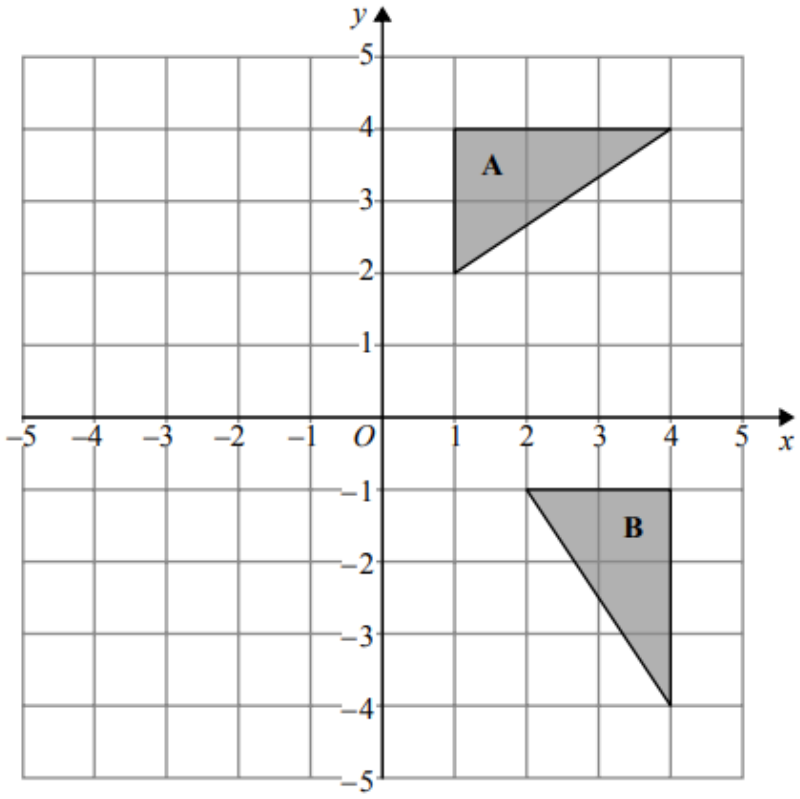
Find the value of c and the value of d.

$c =$ .....

$d =$ .....

(Total for Question 26 is 3 marks)

29



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

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Sample 1 – Paper 1F **(Total for Question 29 is 2 marks)**