

Name

Class



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# Transformations

(9 – 1) Topic booklet

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

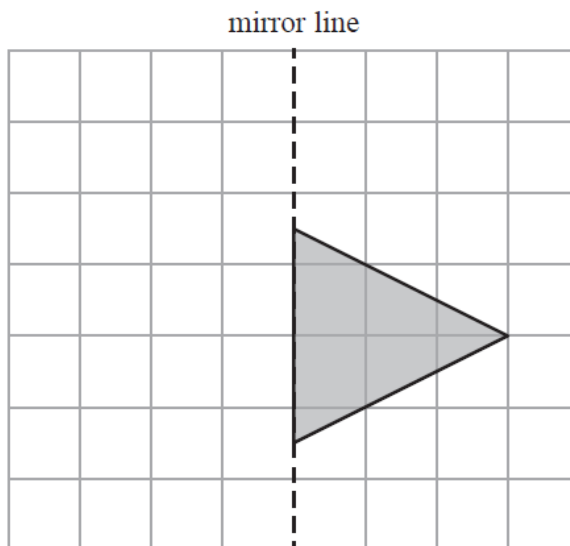
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

## 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.**

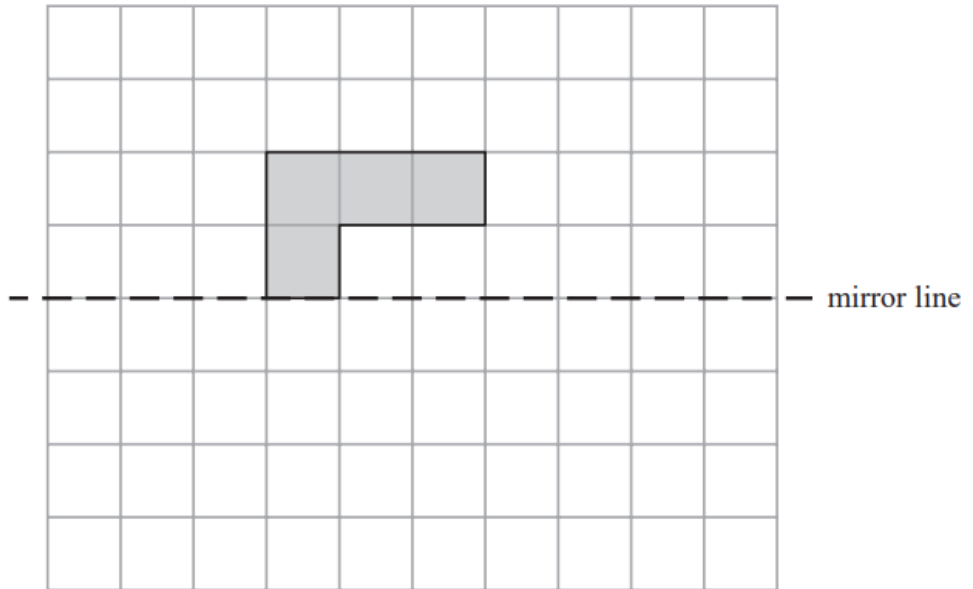
3 On the grid, reflect the shaded triangle in the mirror line.



June 2022 – Paper 1F

**(Total for Question 3 is 1 mark)**

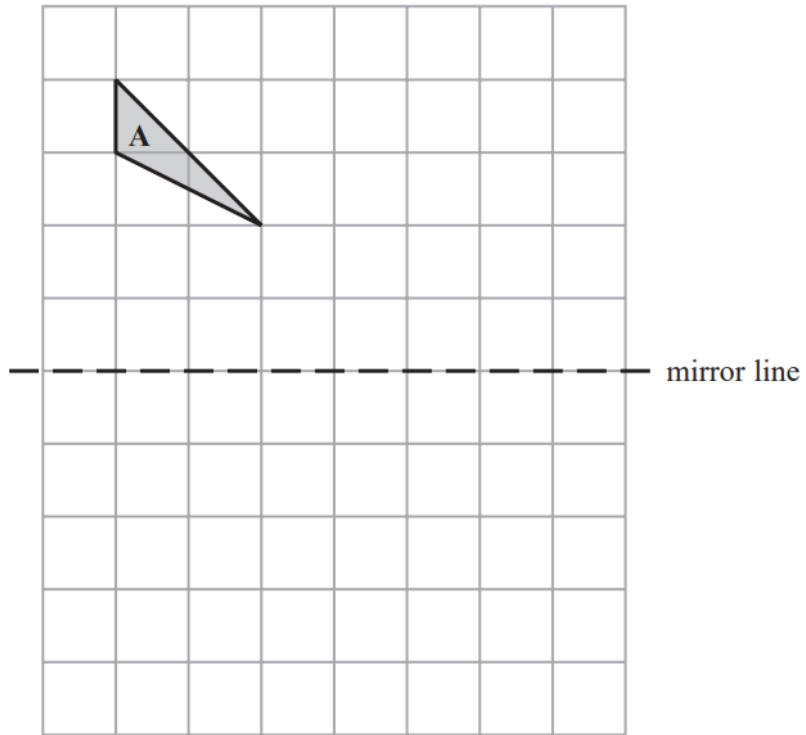
10 On the grid, reflect the shaded shape in the mirror line.



November 2018 – Paper 3F

**(Total for Question 10 is 1 mark)**

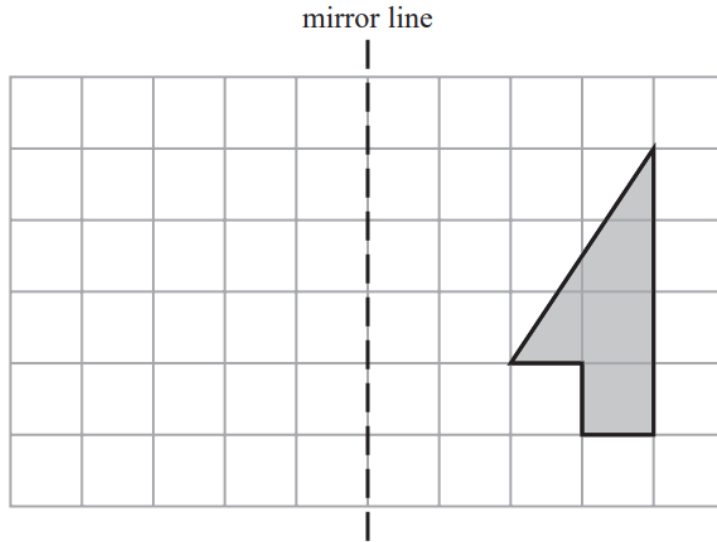
**11** Reflect shape **A** in the mirror line.



November 2021 – Paper 1F

**(Total for Question 11 is 2 marks)**

11

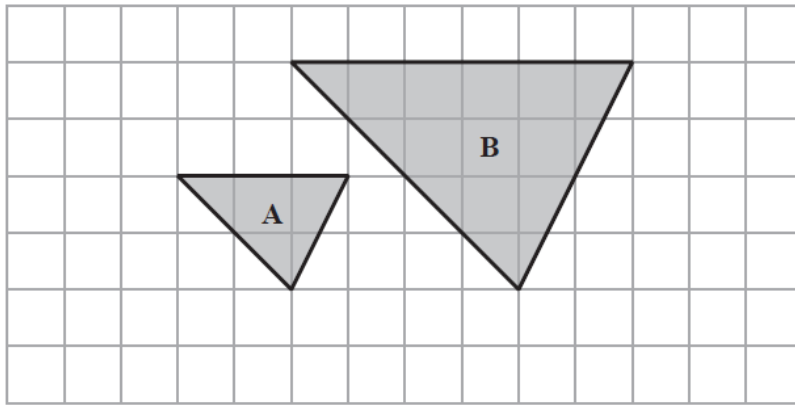


Reflect the shaded shape in the mirror line.

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**.

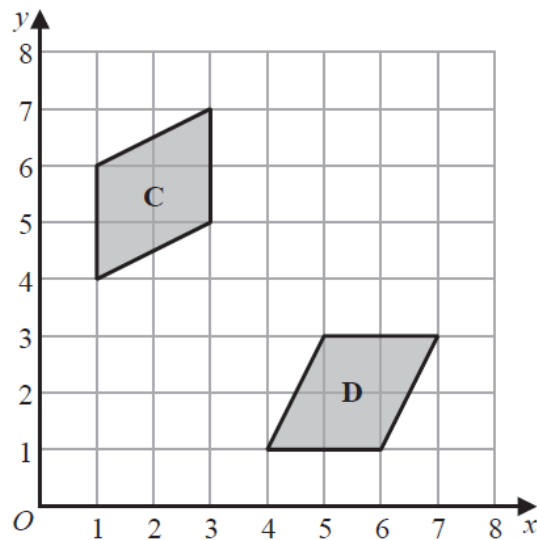
(a) (i) Write down the scale factor of the enlargement.

.....  
(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**.

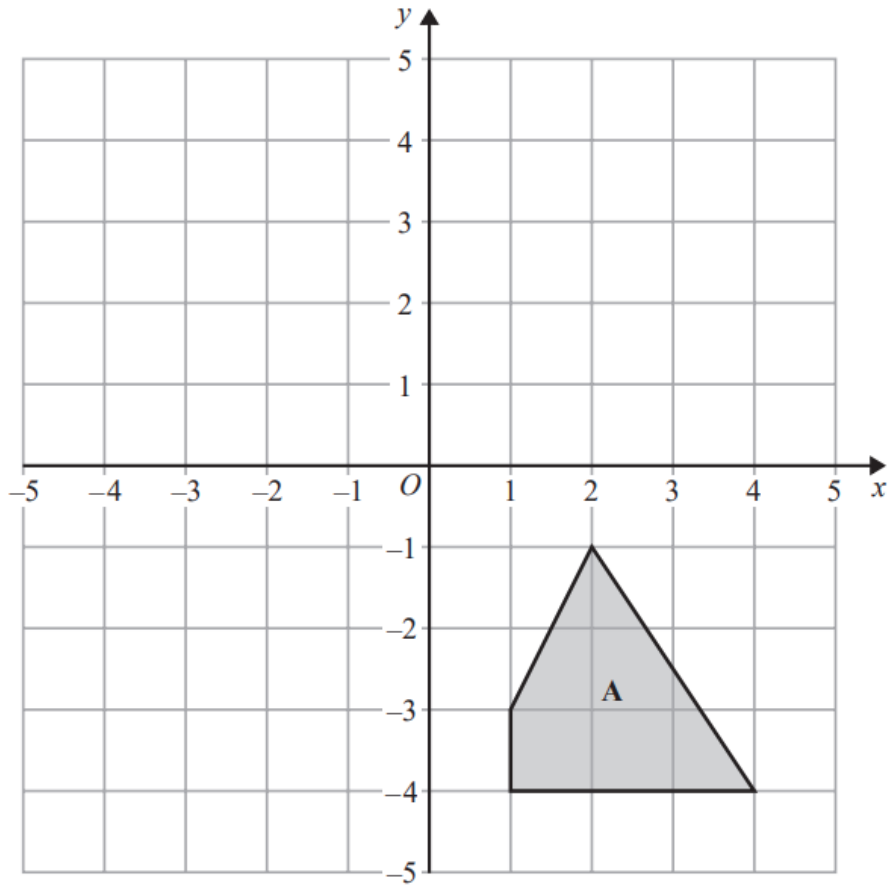
(b) (i) On the grid, draw the mirror line.

(1)

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

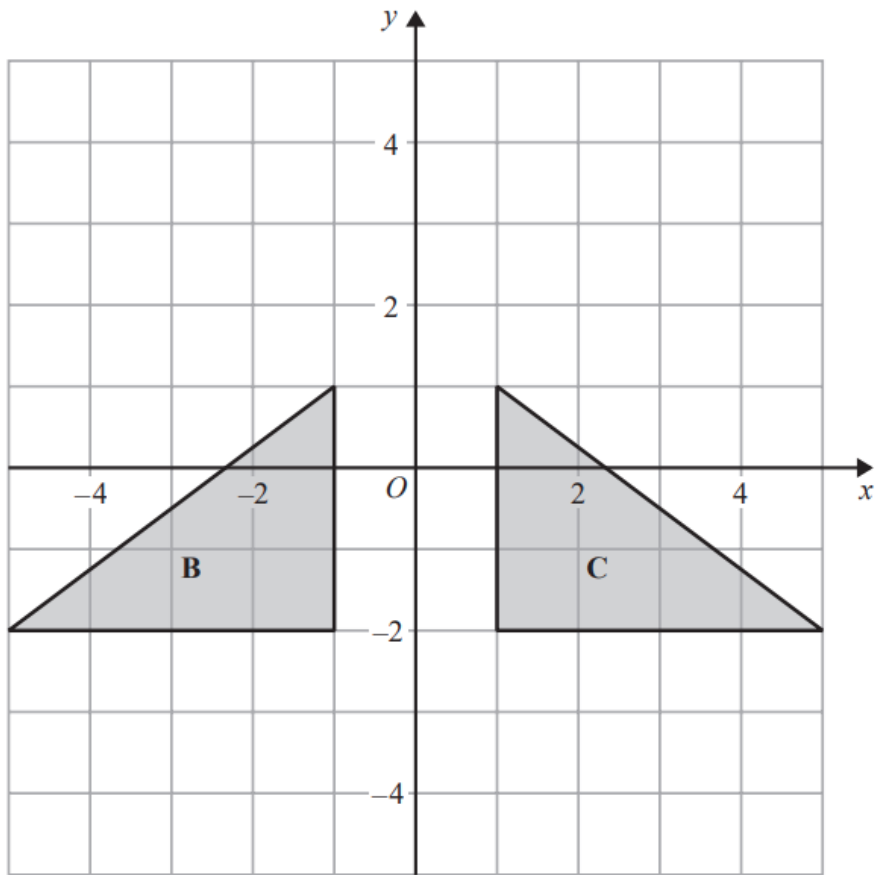
.....  
(1)

13



(a) Rotate shape A  $90^\circ$  clockwise about centre O.

(2)

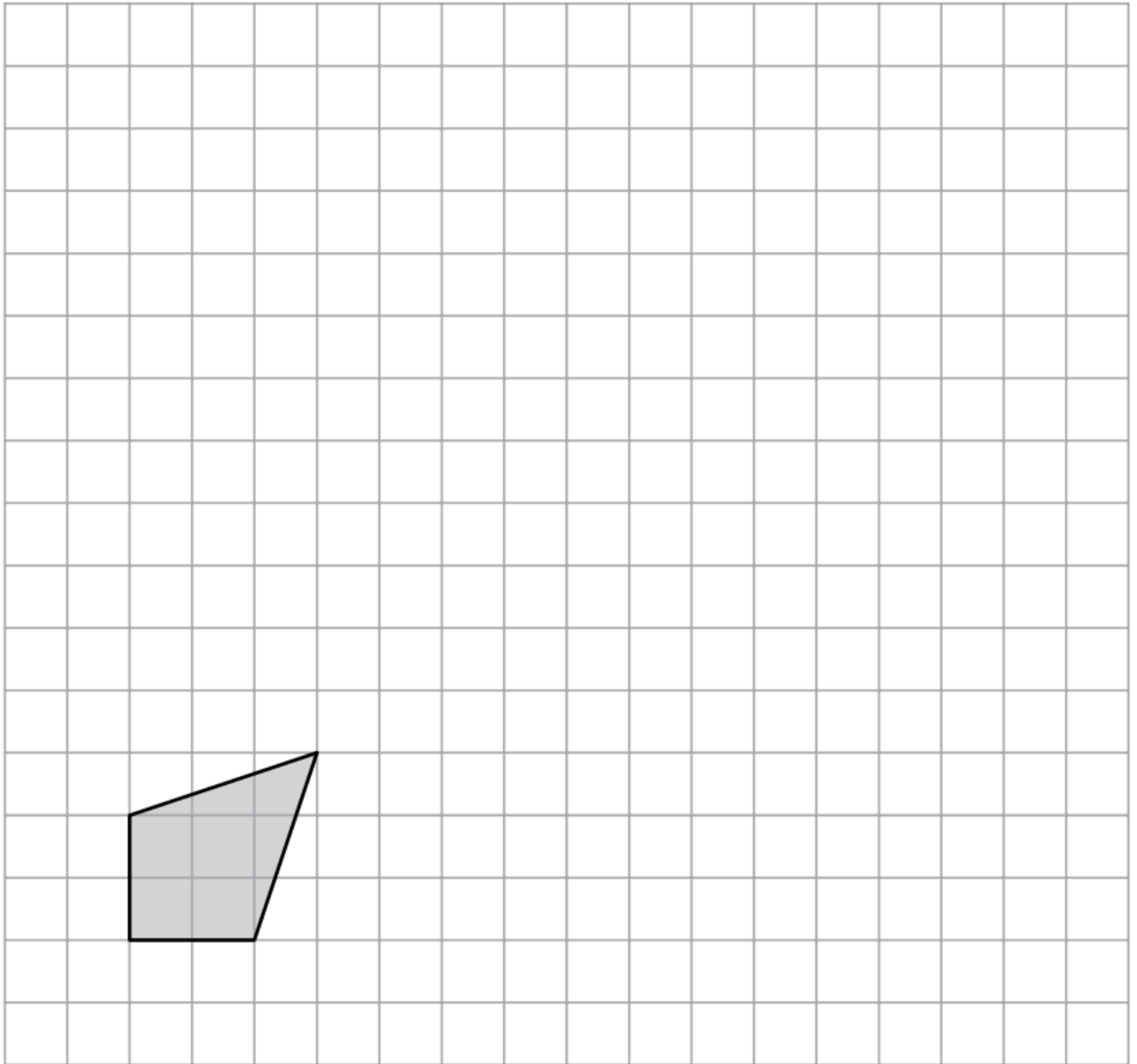


(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.

(2)



13

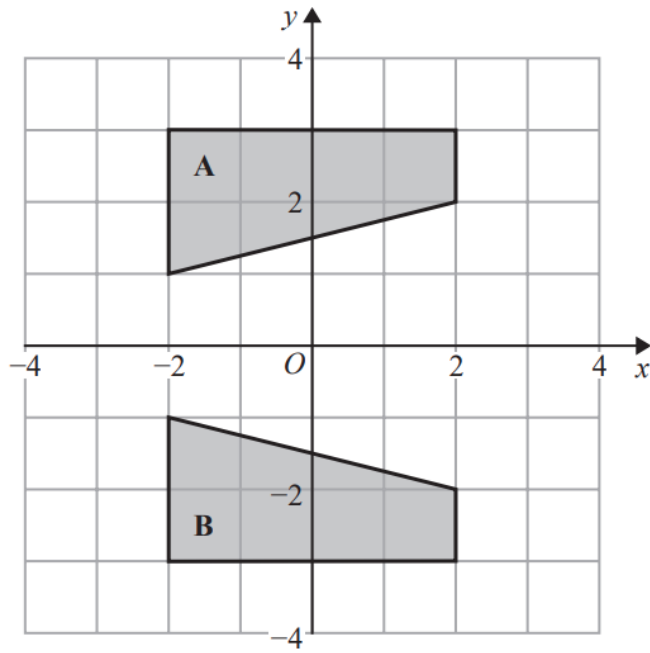


On the grid, draw an enlargement of the shaded shape with a scale factor of 3

November 2019 – Paper 2F

**(Total for Question 13 is 2 marks)**

14



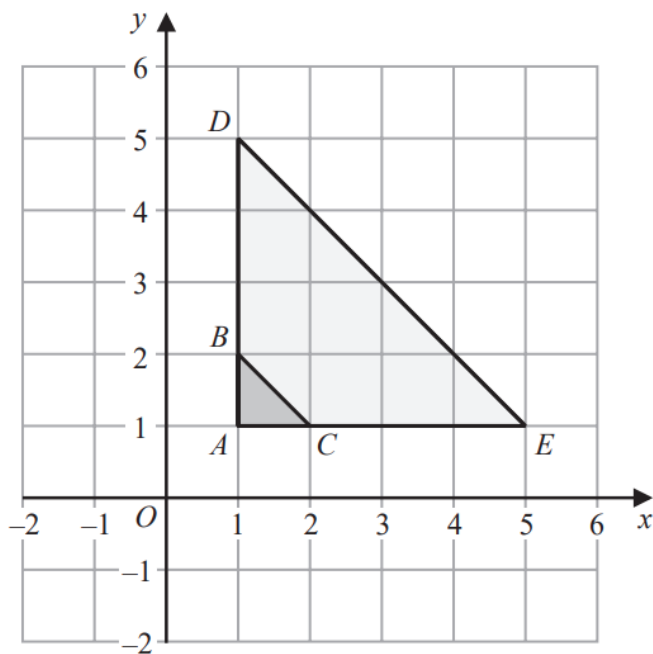
Describe fully the single transformation that maps shape A onto shape B.

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November 2017 – Paper 3F

(Total for Question 14 is 2 marks)

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

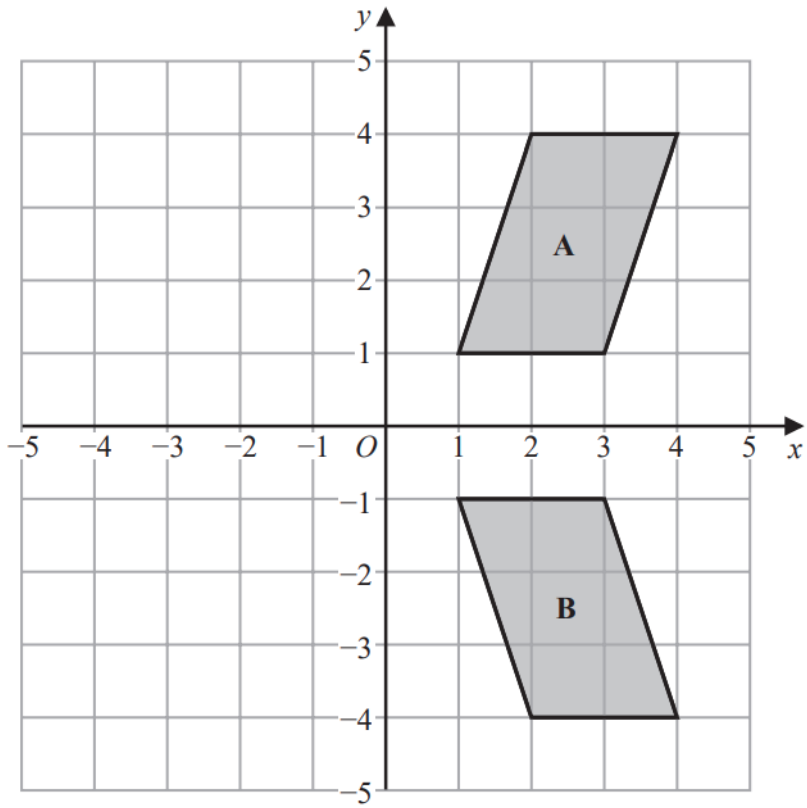


Describe fully the single transformation that maps triangle  $ABC$  onto triangle  $ADE$ .

.....

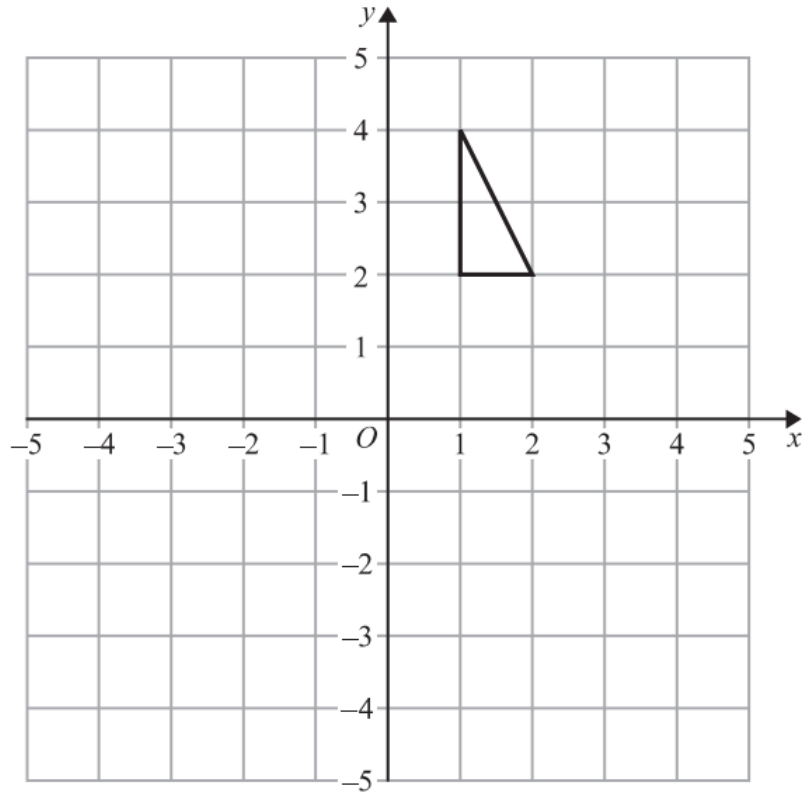
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Describe fully the single transformation that maps shape A onto shape B.

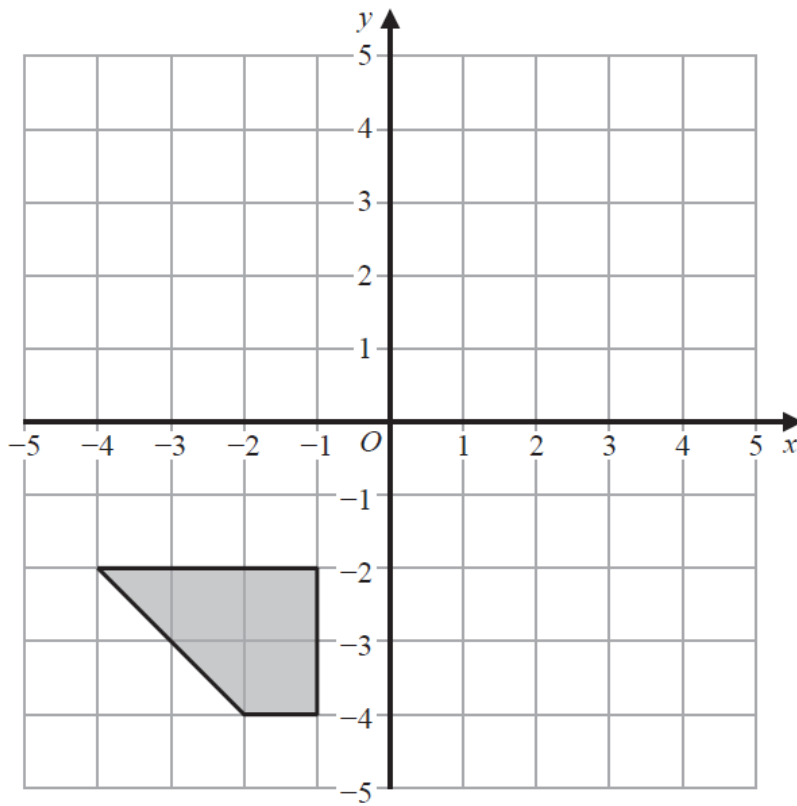
17



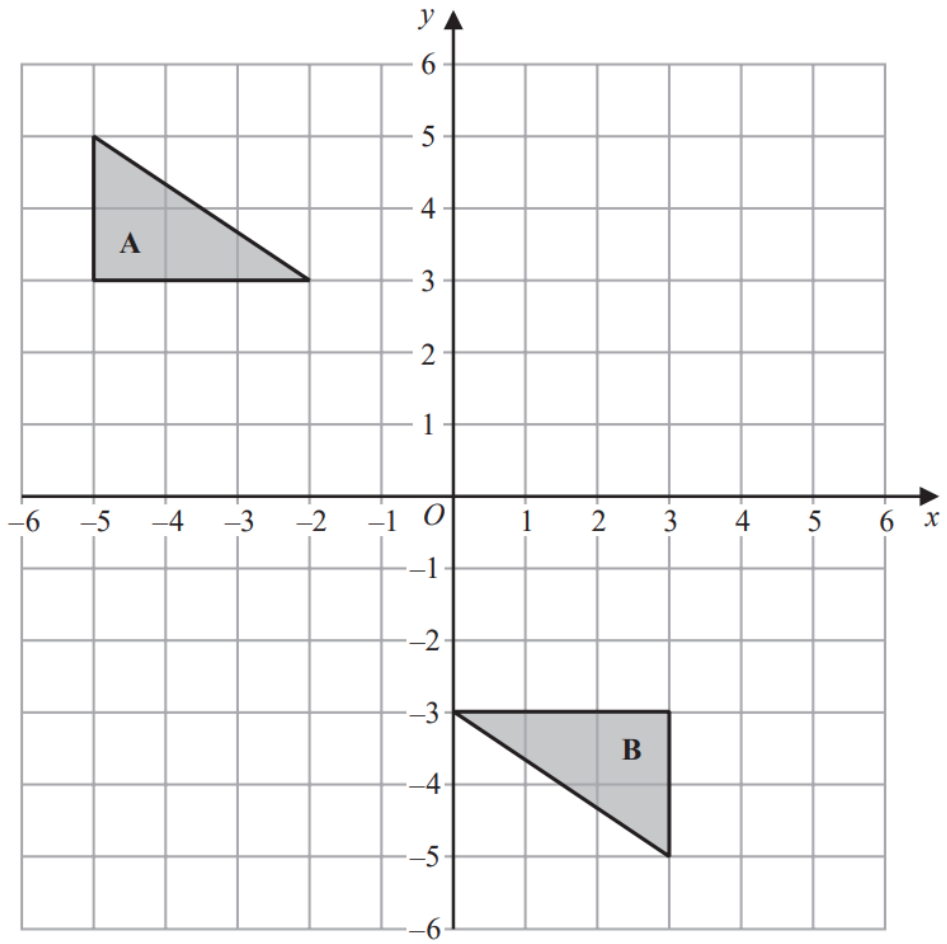
On the grid, rotate the triangle  $90^\circ$  clockwise about  $(0, 0)$ .

Specimen 1 – Paper 1F

**(Total for Question 17 is 2 marks)**



Rotate the shaded shape  $90^\circ$  anticlockwise about  $(0,0)$



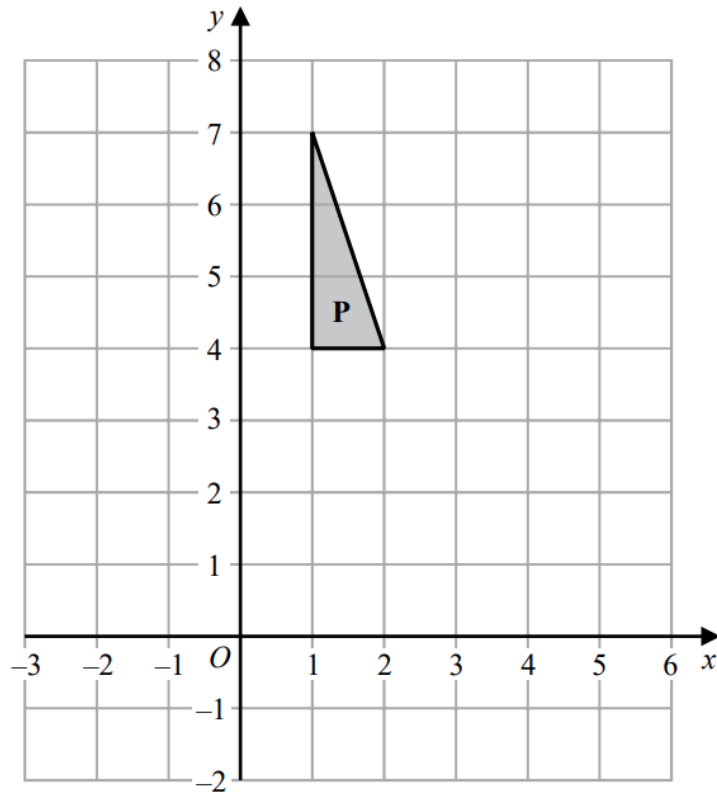
Describe fully the single transformation that maps triangle A onto triangle B.

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.....

.....

18

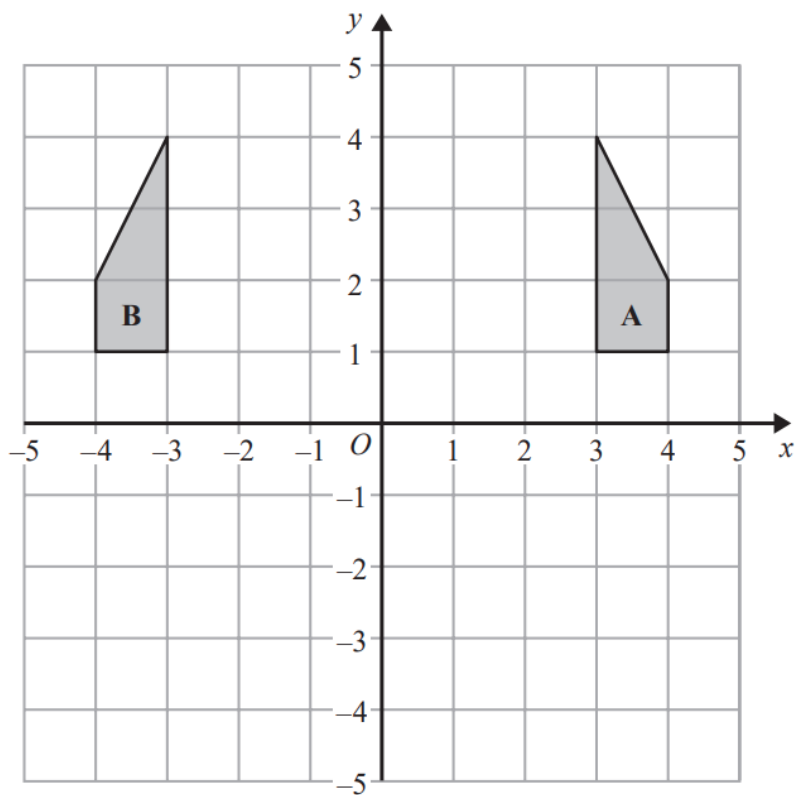


Reflect shape **P** in the line  $y = 3$

November 2019 – Paper 3F

**(Total for Question 18 is 2 marks)**

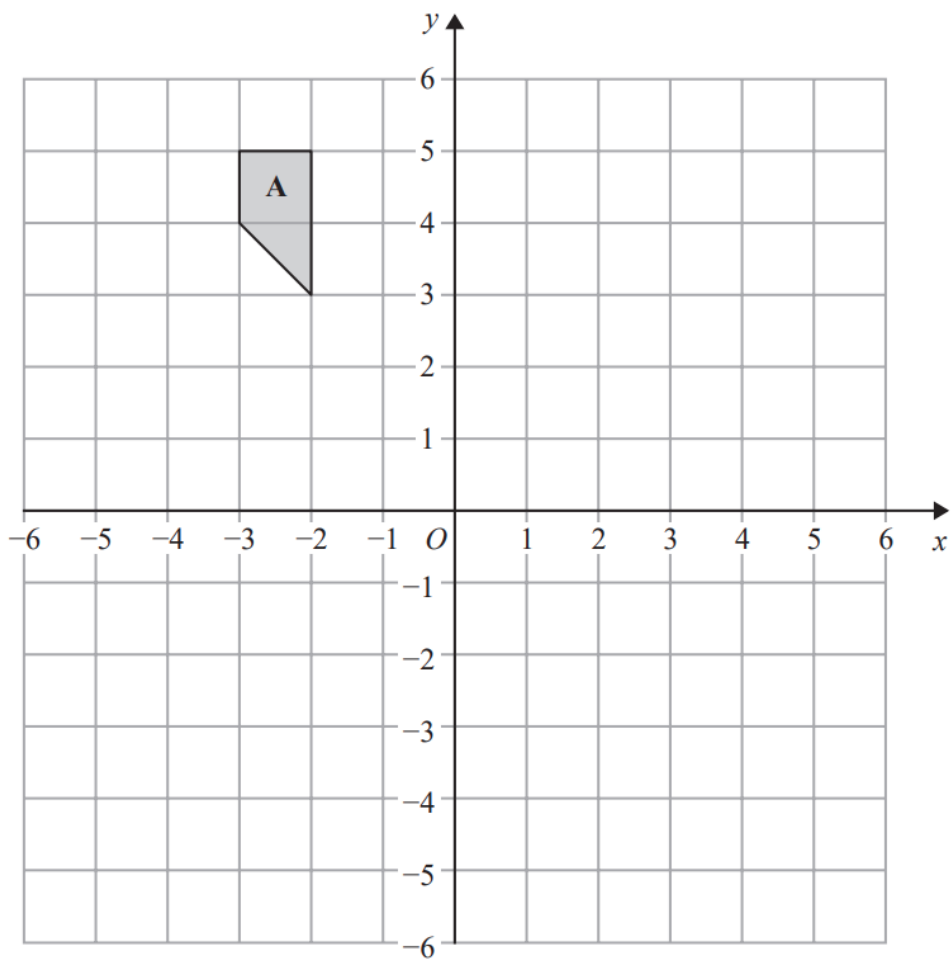




Describe fully the single transformation that maps shape **A** onto shape **B**.

.....

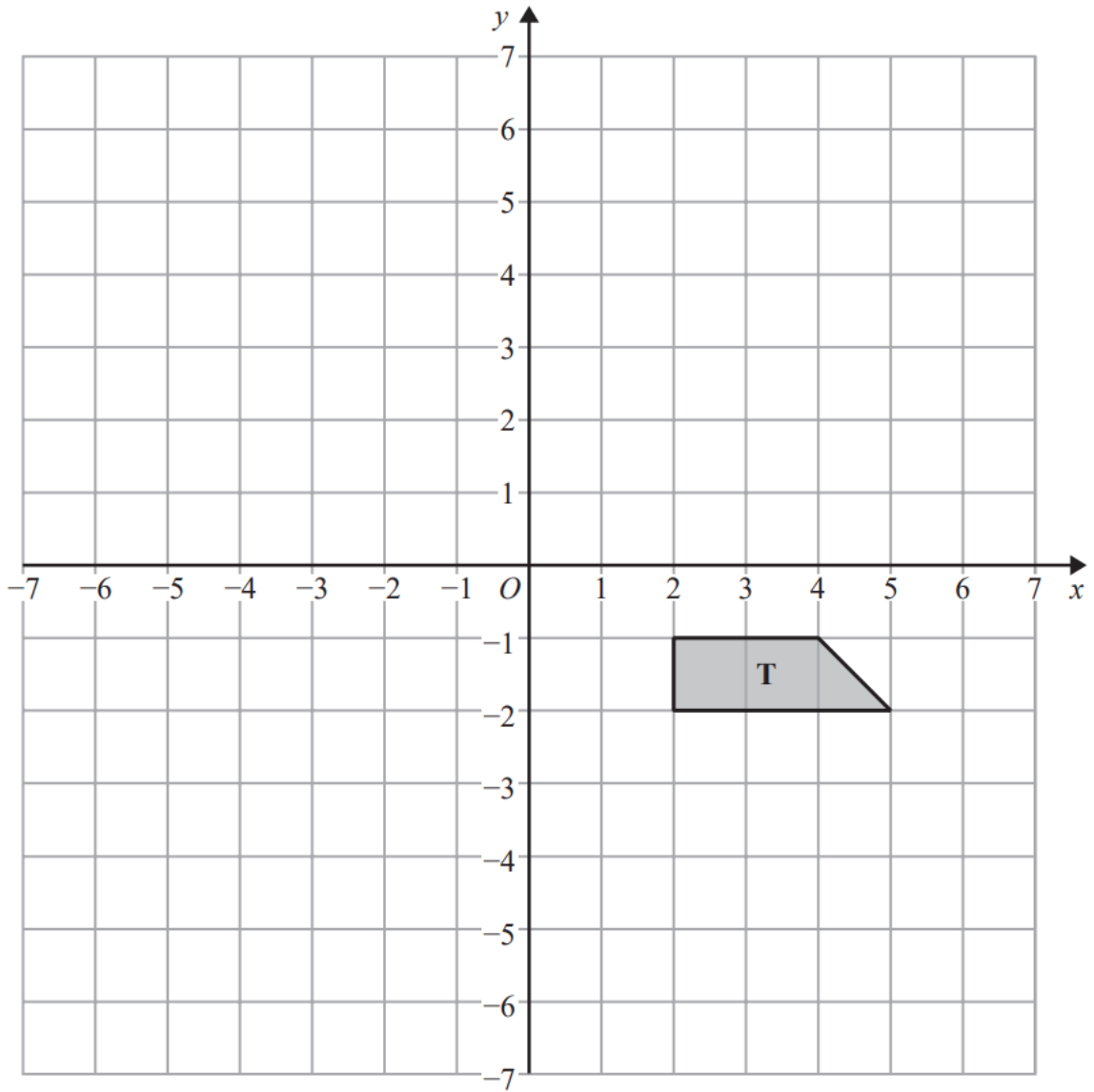
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Rotate shape A  $180^\circ$  about (1, 0)

November 2018 – Paper 1F

(Total for Question 19 is 2 marks)

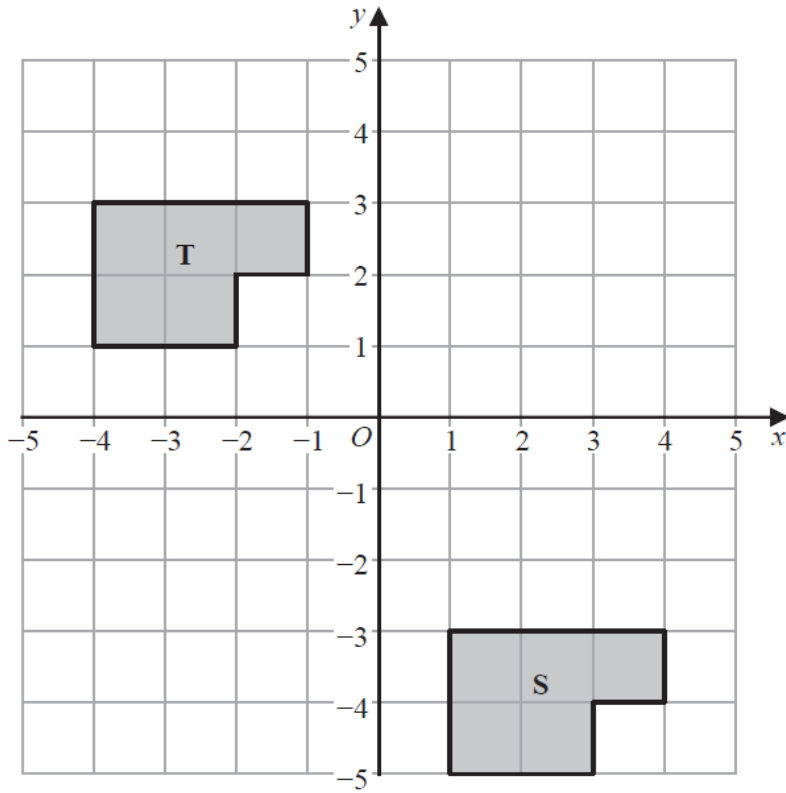


- (a) Rotate trapezium **T**  $180^\circ$  about the origin.  
Label the new trapezium **A**.

(1)

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

(1)

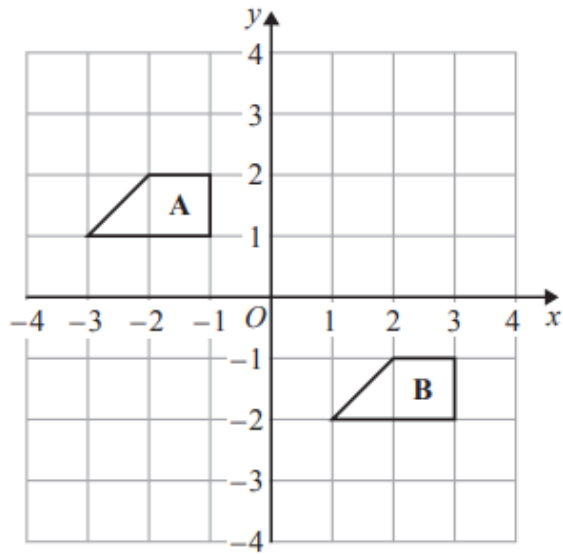


Describe fully the single transformation that maps shape S onto shape T.

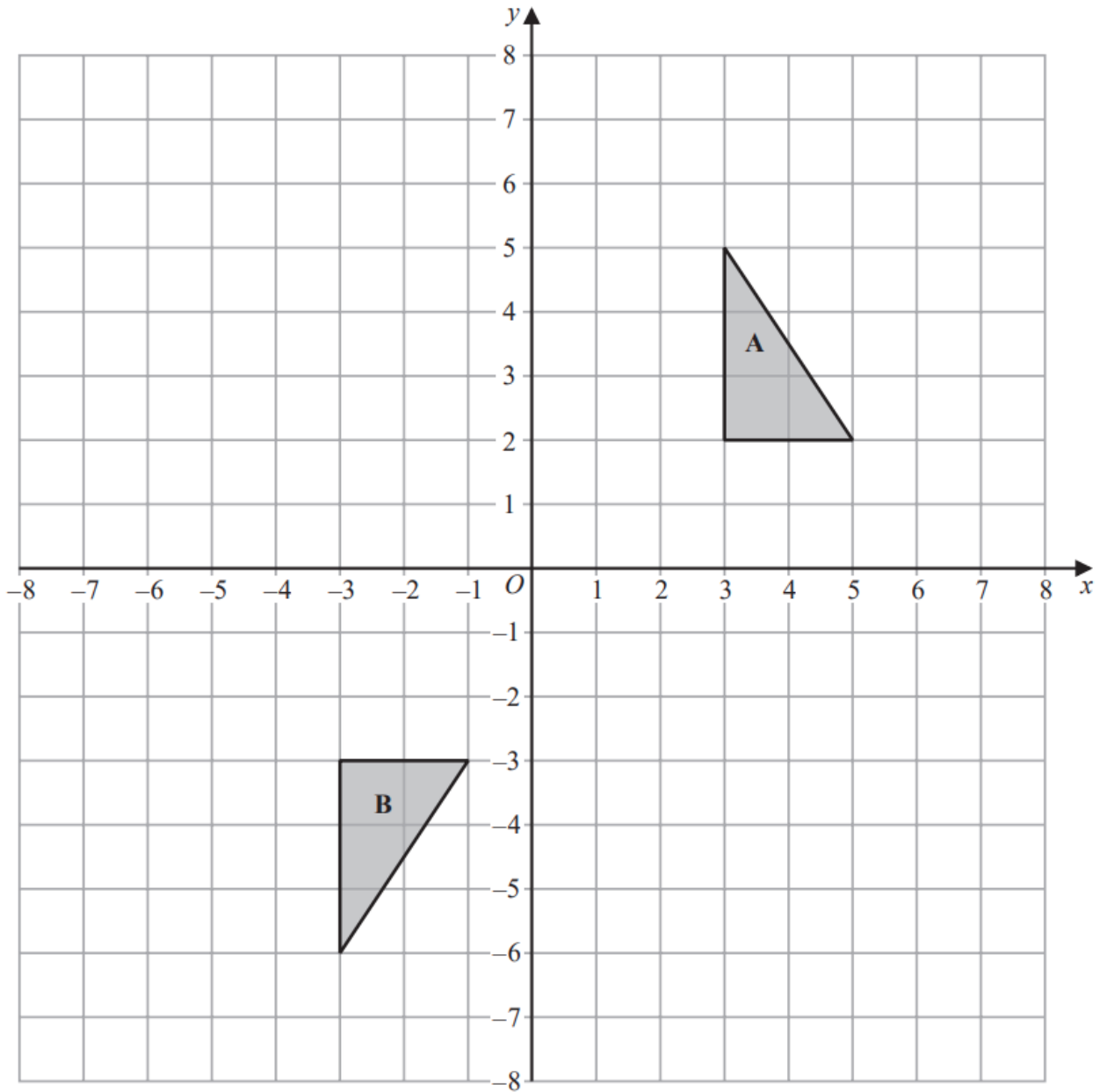
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.....



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

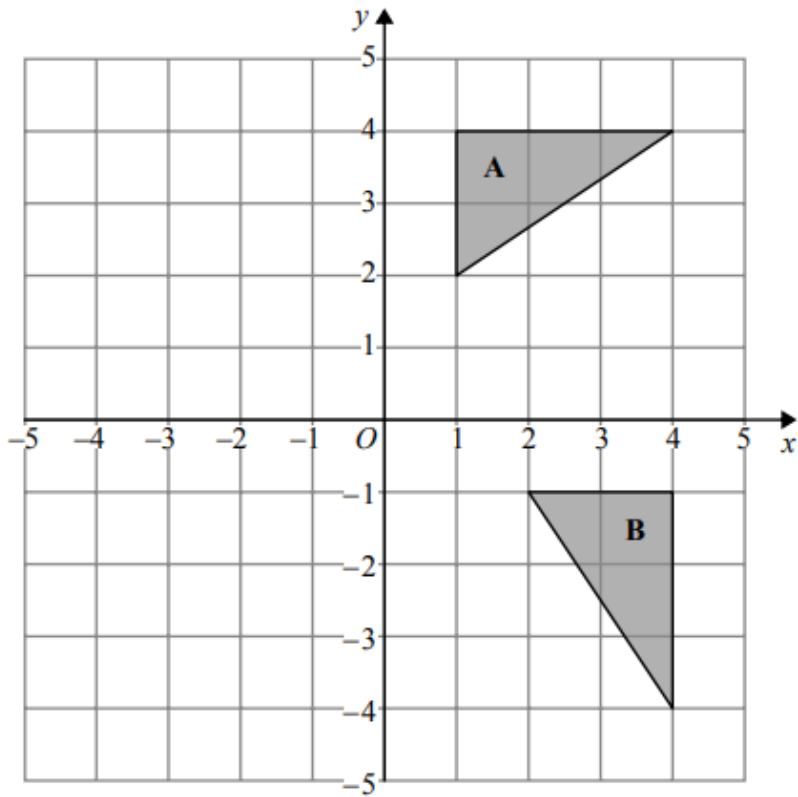


Shape **A** can be transformed to shape **B** by a reflection in the  $x$ -axis followed by a translation  $\begin{pmatrix} c \\ d \end{pmatrix}$

Find the value of  $c$  and the value of  $d$ .

$c = \dots\dots\dots$

$d = \dots\dots\dots$



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