Write your name here

| Surname | Other names |
|---|---|
| | |

**In the style of:**
**Pearson Edexcel**
**Level 1/Level 2 GCSE (9 - 1)**

Centre Number | | | | | |

Candidate Number | | | | |

# Mathematics

## Transformations

**Foundation Tier**

GCSE style questions arranged by topic

Paper Reference
**1MA1/1F**

**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.*
- **Calculators may not be used.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out**.

### Information

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

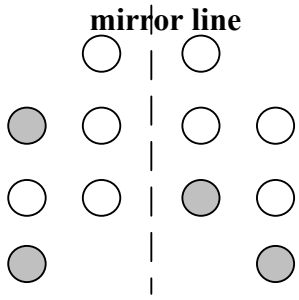
### Advice

- 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.

*Turn over* ▶

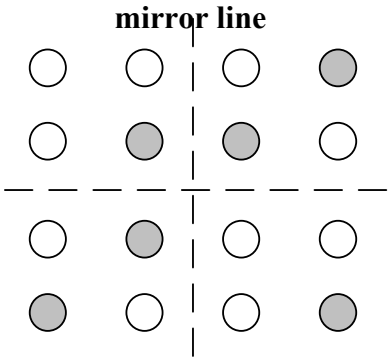
**1** Here are some patterns of circles.

**(a)** Shade **two** more circles to give this pattern symmetry in the mirror line.



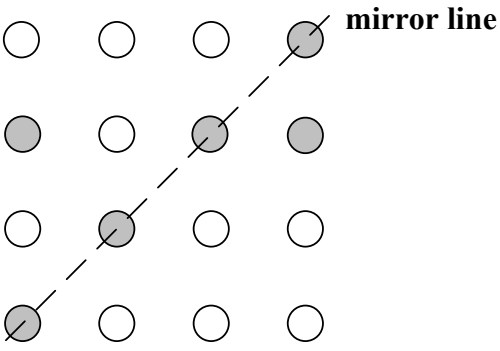

**(2)**

**(b)** Shade **two** more circles to give this pattern symmetry in both mirror lines.




**(2)**

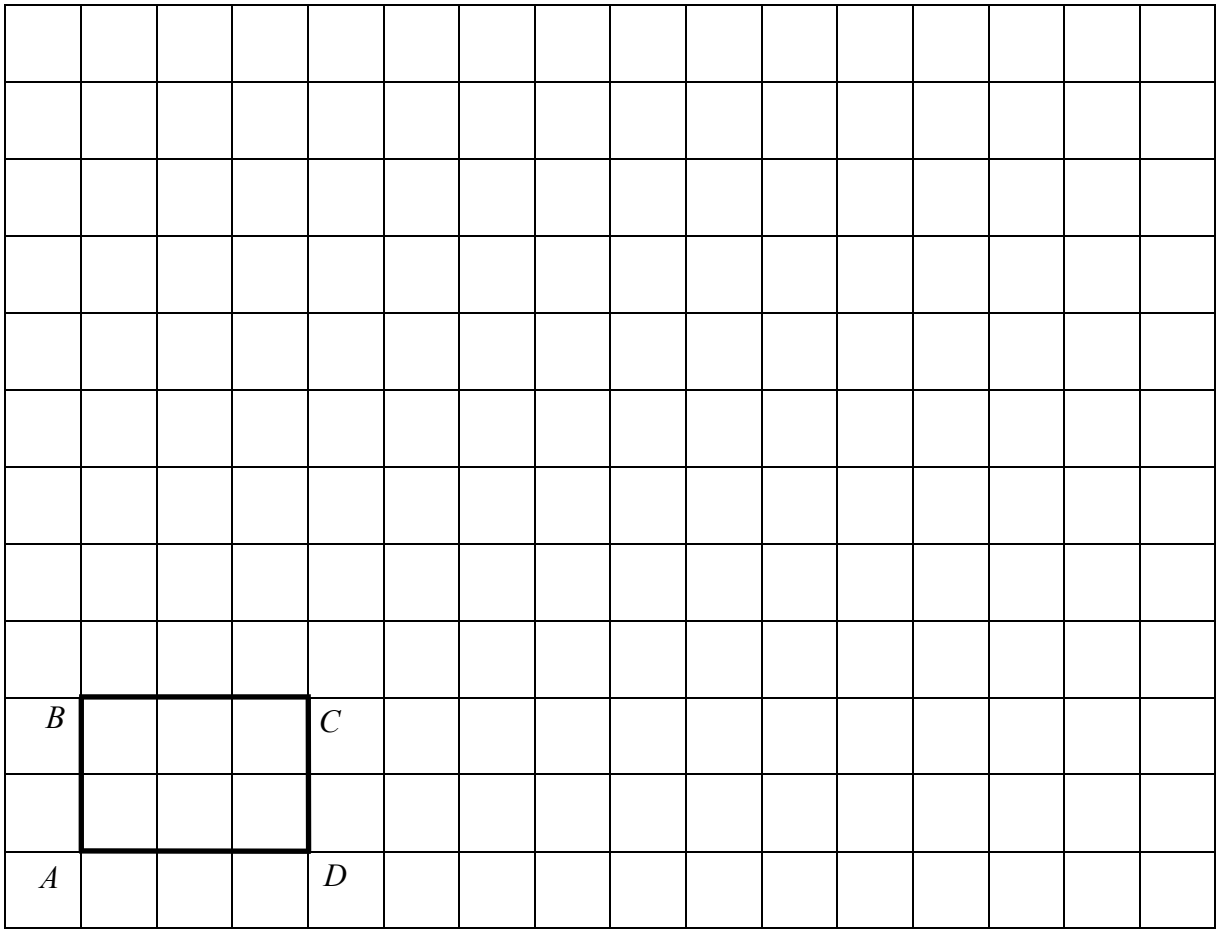
**(c)** Shade **four** more circles to give this pattern symmetry in the mirror line.




**(2)**

**(Total for Question 1 is 6 marks)**

**2** The shape *ABCD* is drawn on a grid.




**(a)** Enlarge *ABCD* by scale factor 3.

**(2)**

**(b)** How many times bigger is the area of the enlarged shape than the area of *ABCD*?

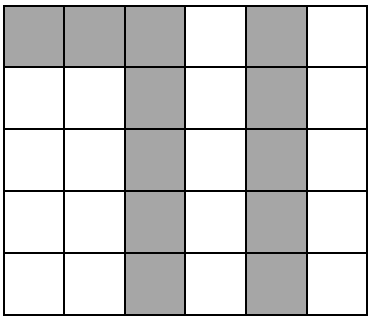
.....

**(2)**

**(Total for Question 2 is 4 marks)**

**3**

The number 71 is shaded on the grid.



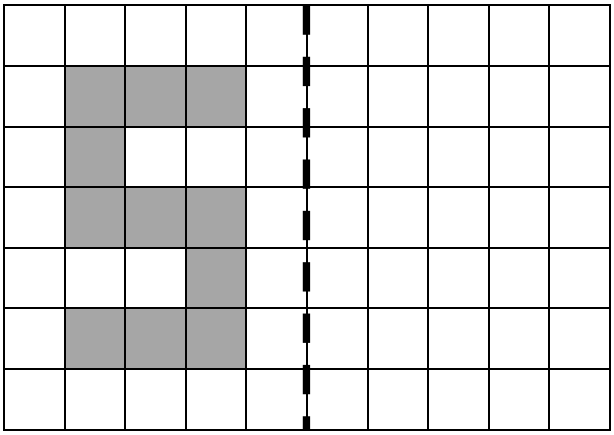
**(a)** What fraction of the grid is shaded?

Give your answer in its simplest form.

.....

**(3)**

**(b)** The letter S is shaded on this grid.

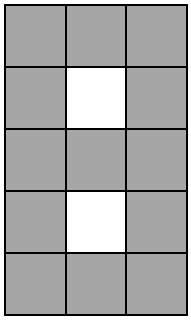


**mirror line**

Draw the reflection of the letter S in the mirror line.

**(2)**

**3 (c)** The number eight is drawn.



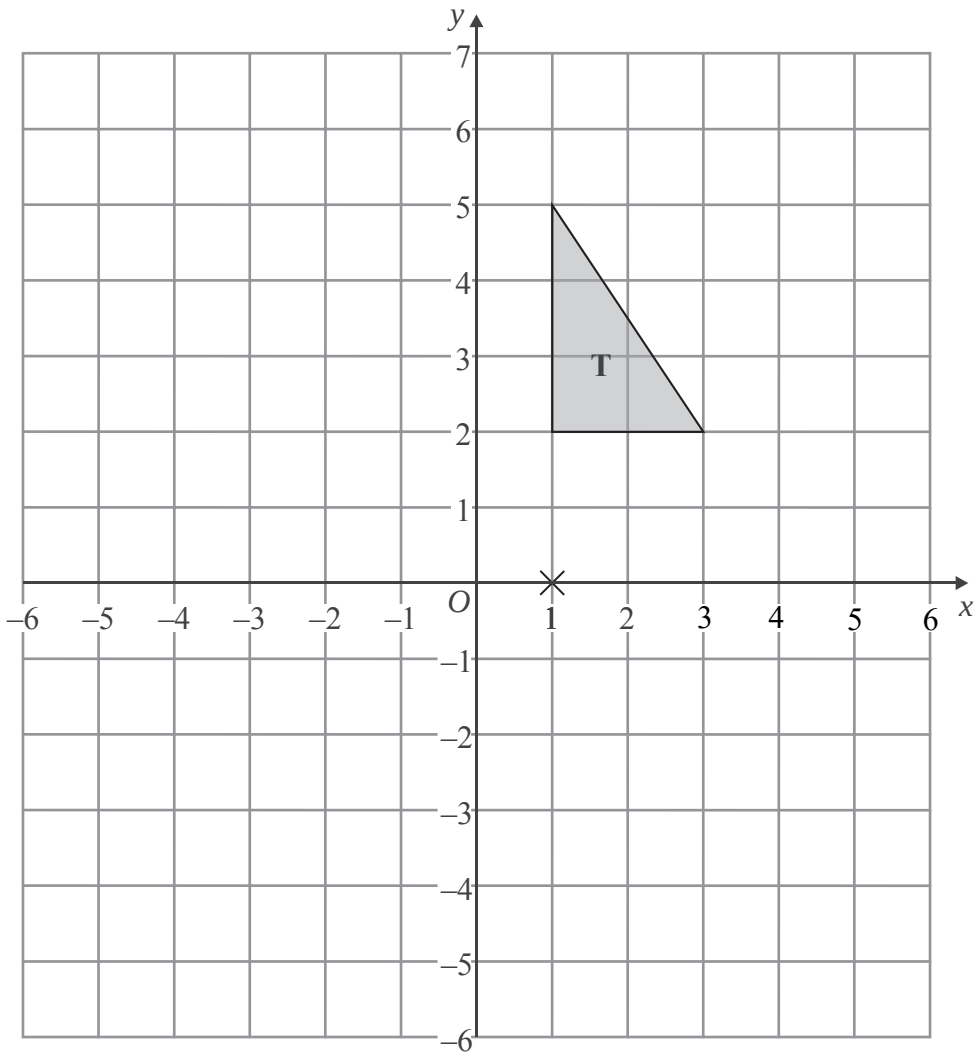
Write down the order of rotational symmetry.

.....

**(1)**

**(Total for Question 3 is 6 marks)**

**4**



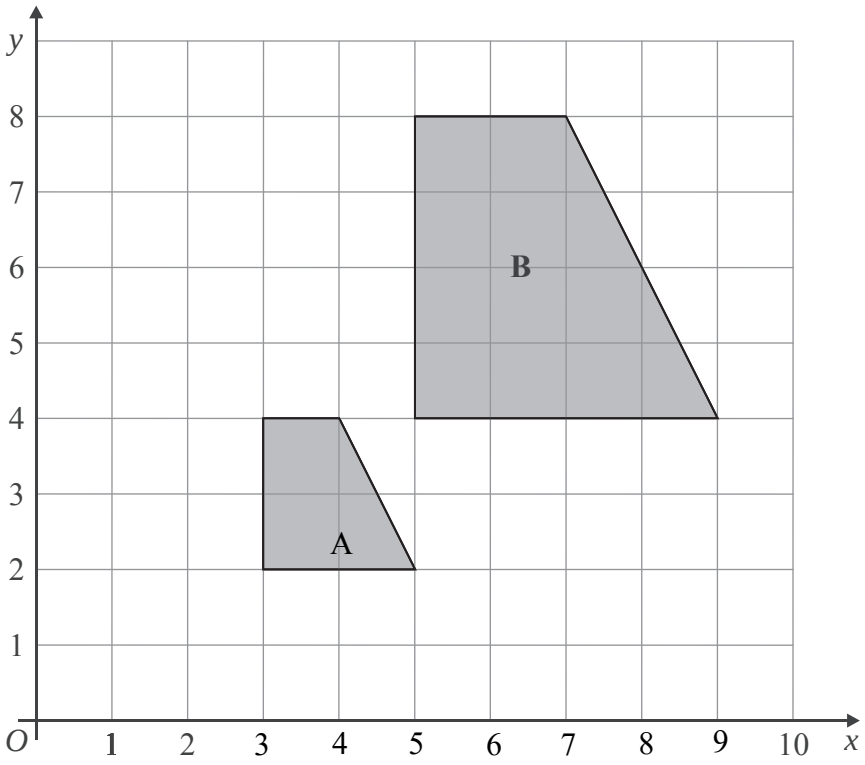

Triangle **T** has been drawn on the grid.

Rotate triangle **T** 90° clockwise about the point (1, 0).

Label the new triangle **A**.

**(Total for Question 4 is 2 marks)**

**5**



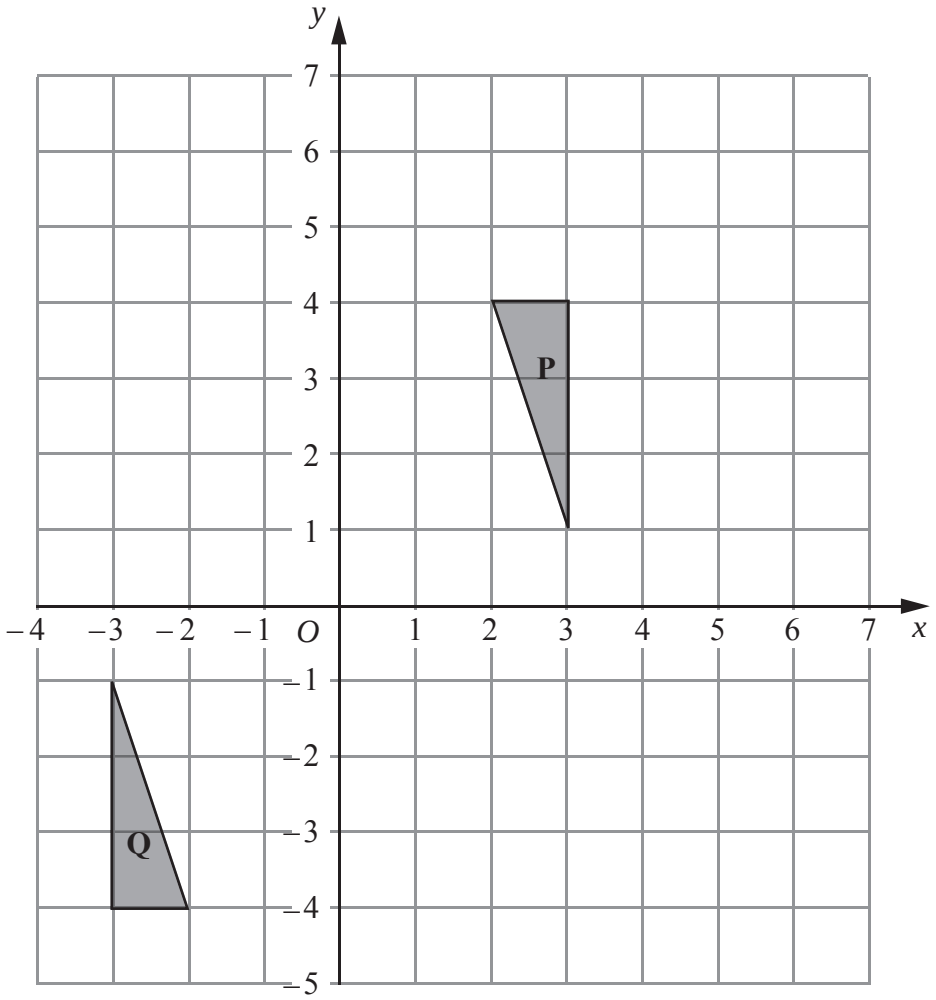

Describe fully the single transformation which maps shape **A** onto shape **B**.

.....

.....

**(Total for Question 5 is 3 marks)**

**6**




Triangle **P** and triangle **Q** are drawn on the grid.

(a) Describe fully the single transformation which maps triangle **P** onto triangle **Q**.

.....

.....

**(3)**

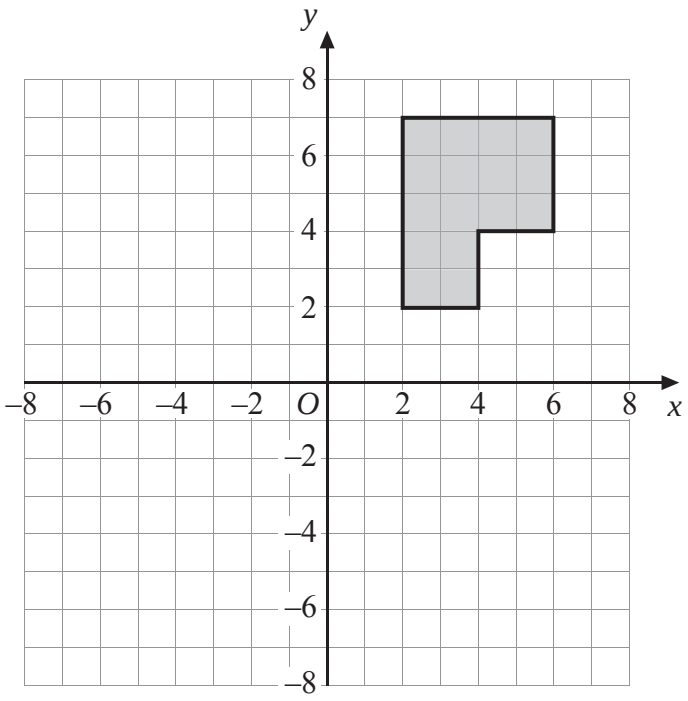
(b) Translate triangle **P** by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$.

Label the new triangle **R**.

**(1)**

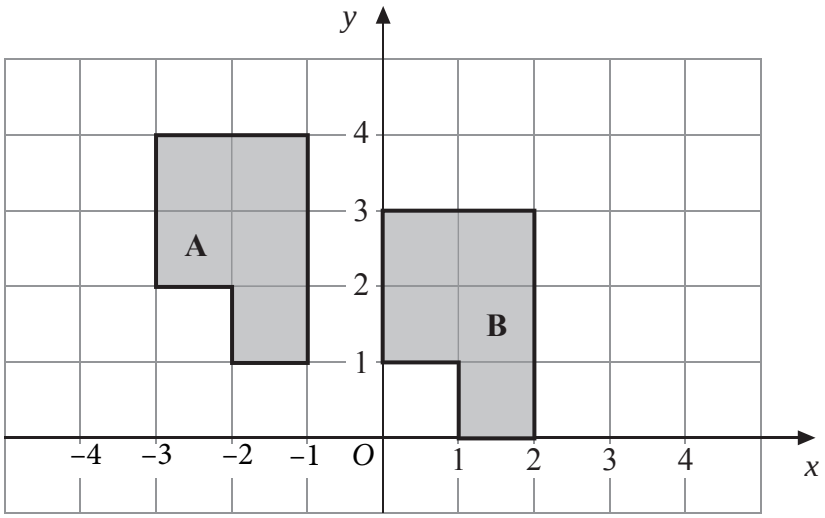
**(Total for Question 6 is 4 marks)**

**7**




(a) Rotate the shaded shape 180° clockwise about the point $O$.

**(2)**



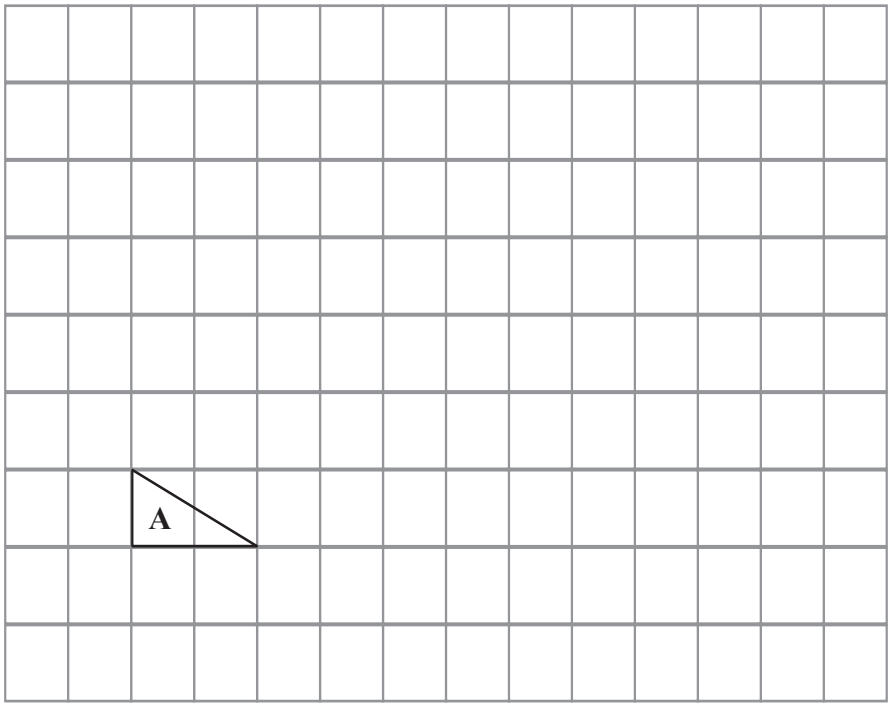

(b) Describe fully the single transformation that will map shape **A** onto shape **B**.

.....

**(2)**

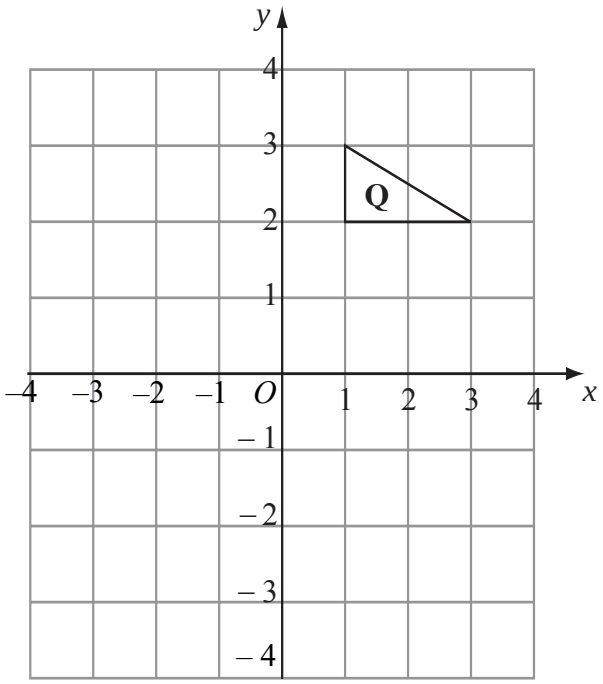
**(Total for Question 7 is 4 marks)**

**8**




Triangle **A** has been drawn on a grid.

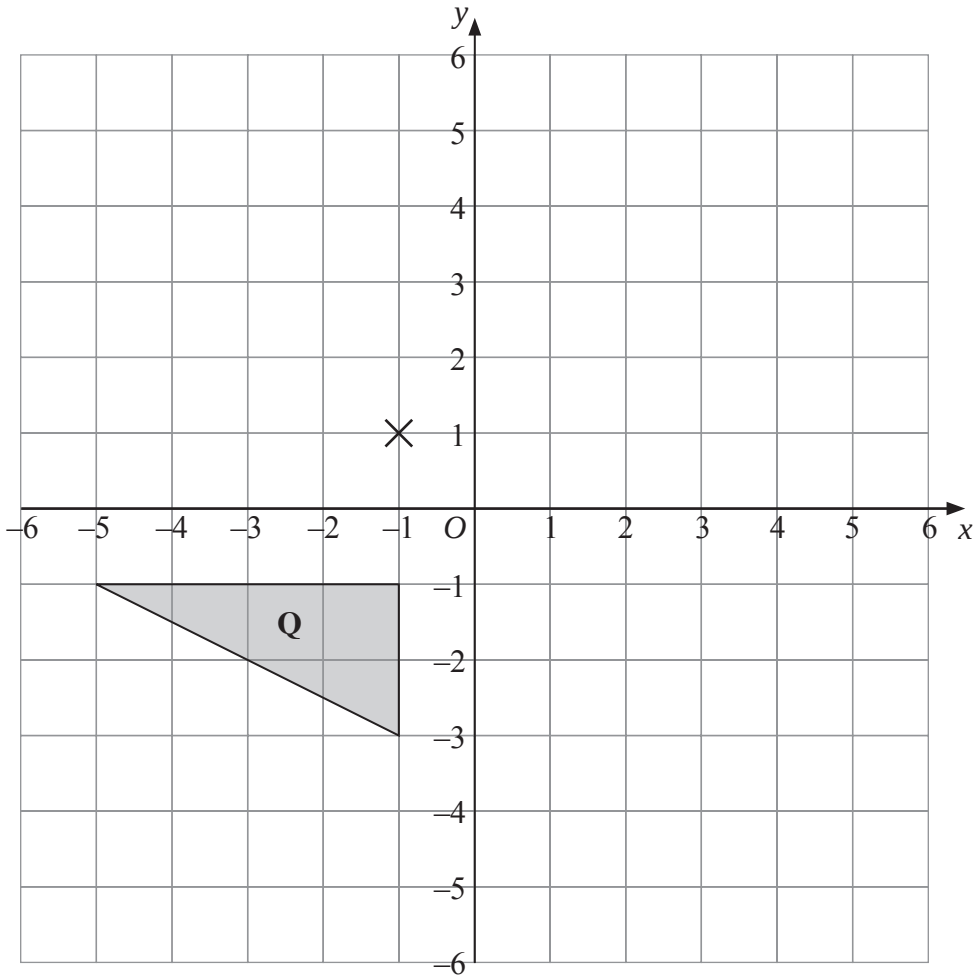
(a) On the grid, draw an enlargement of the triangle **A** with a scale factor 3.




Triangle Q has been drawn on a grid.

(b) On the grid, rotate triangle Q 90° clockwise, centre *O*.

**9**




(a) Rotate triangle **Q** 180° about the point (–1, 1).

Label the new triangle **A**.

**(2)**

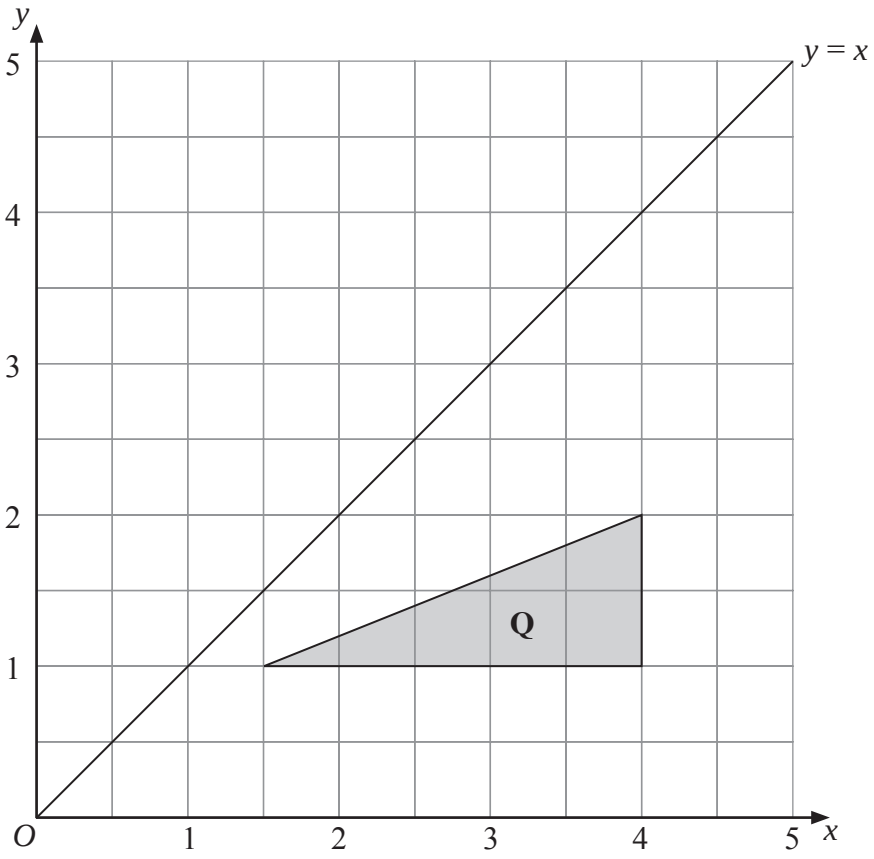
(b) Translate triangle **Q** by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$.

Label the new triangle **B**.

**(1)**

**(Total for Question 9 is 3 marks)**

**10**



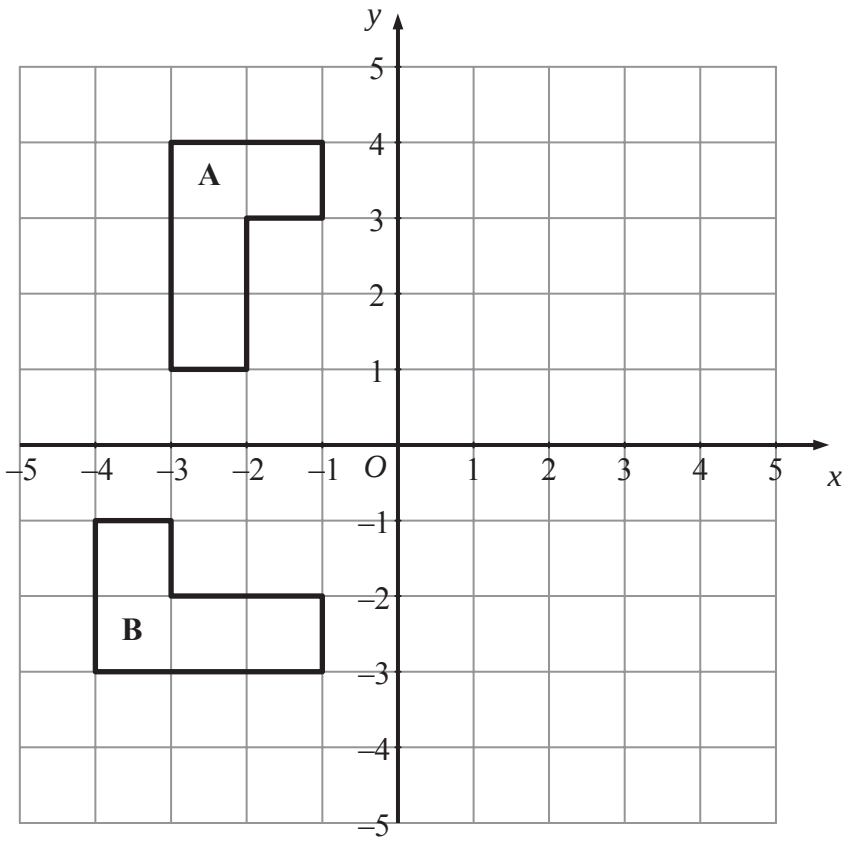

(c) Reflect triangle **Q** in the line $y = x$.

Label the new triangle **C**.

**(5)**

**(Total for Question 10 is 5 marks)**

**11**




(a) Reflect shape **A** in the *y* axis.

**(2)**

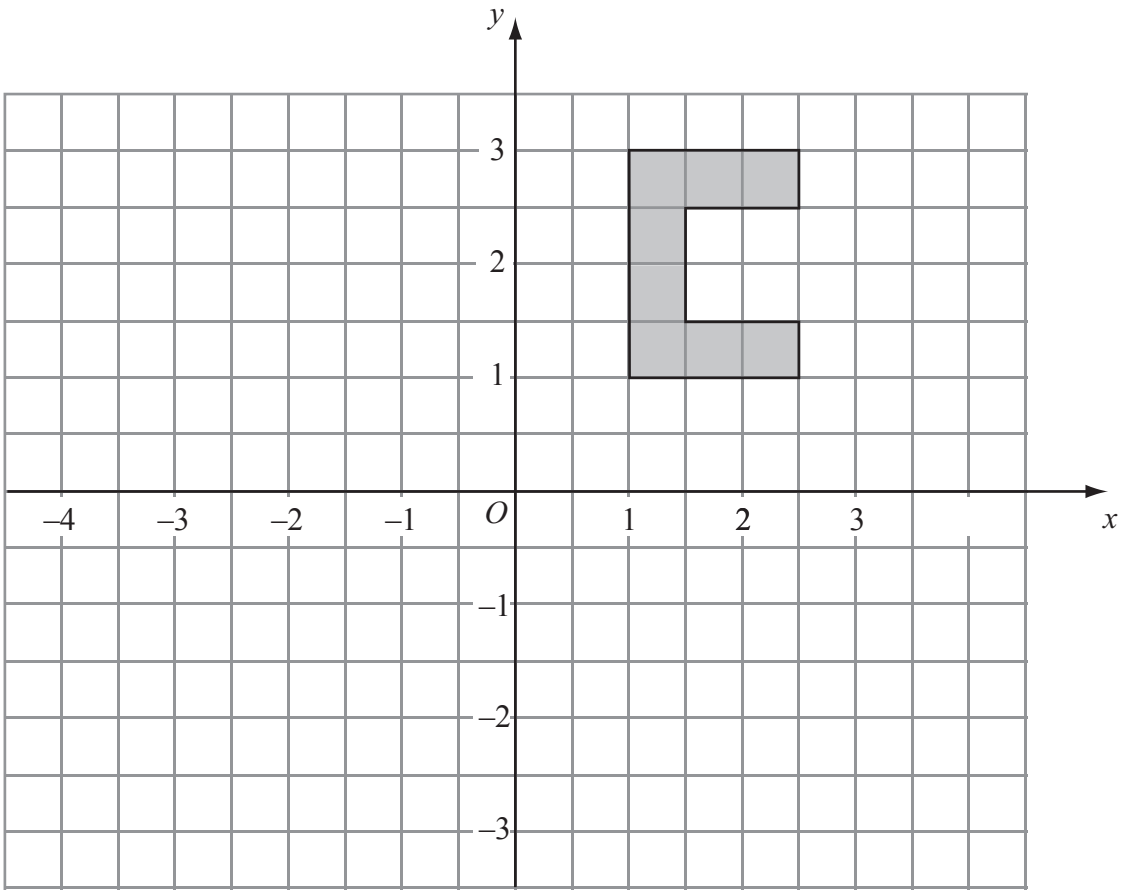
(b) Describe fully the **single** transformation which takes shape **A** to shape **B**.

.....

**(3)**

**(Total for Question 11 is 5 marks)**

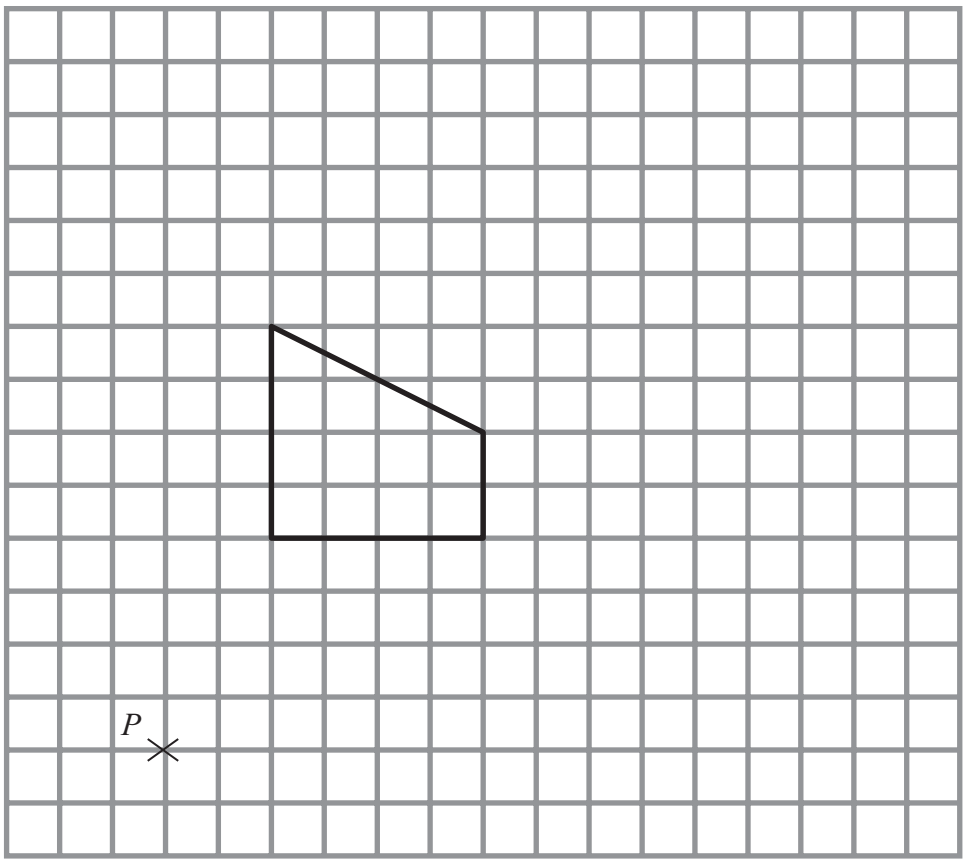
**12**




Rotate the shape 180° centre $O$.

**(Total for Question 12 is 2 marks)**

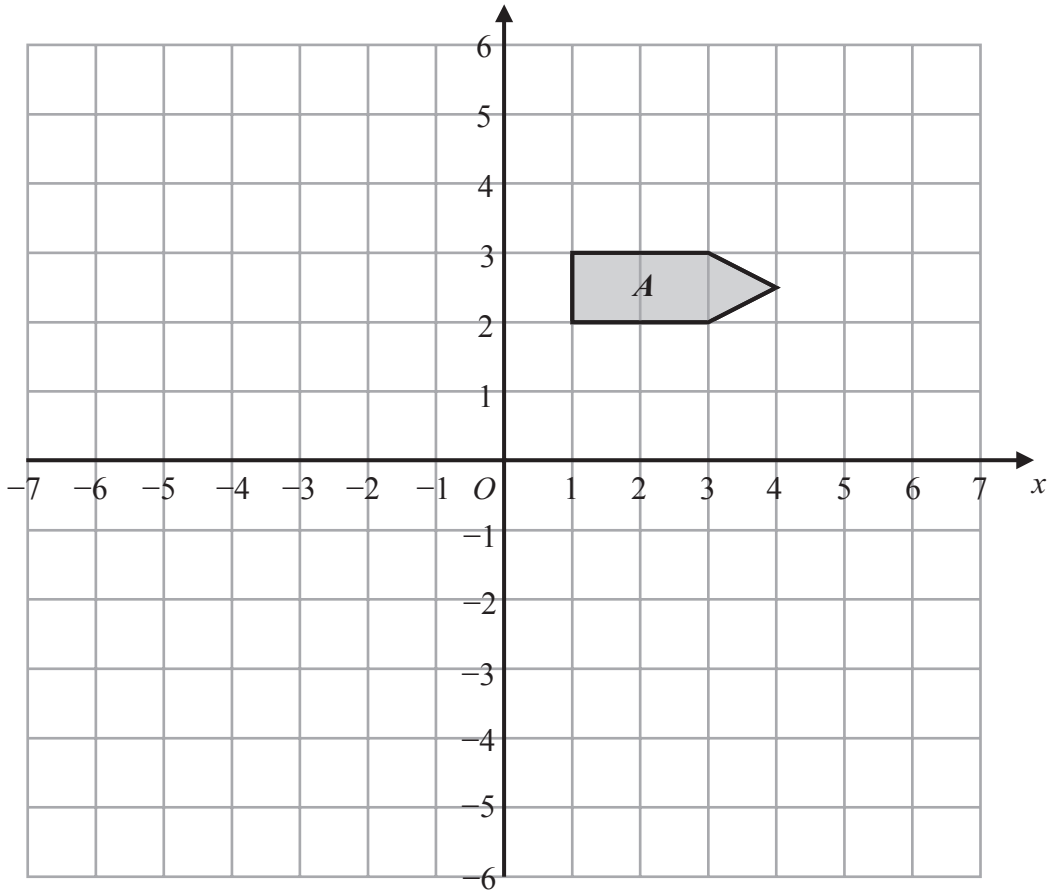
**13**




On the grid, enlarge the shape with a scale factor of $\frac{1}{2}$, centre $P$.

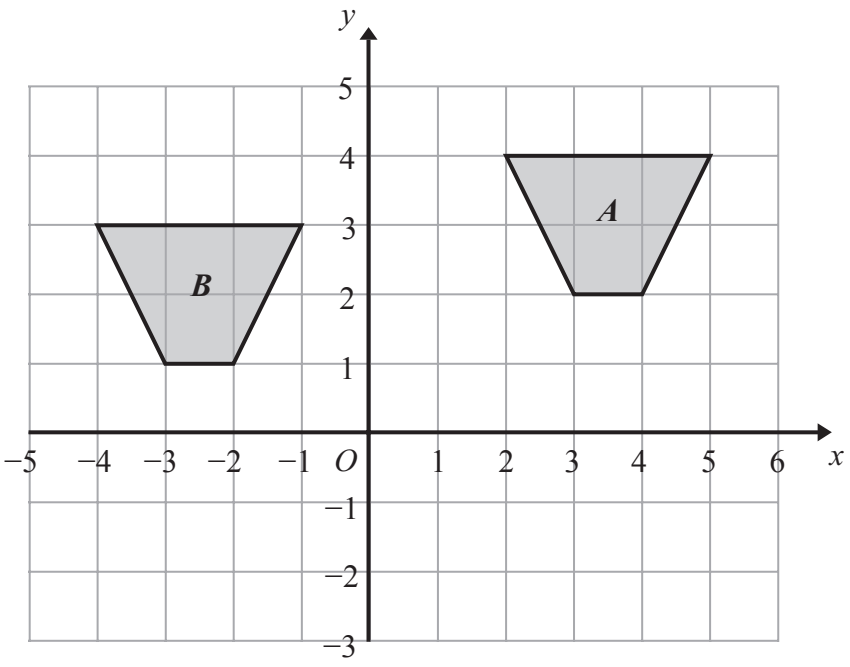
**(Total for Question 13 is 3 marks)**

**14**




(a) On the grid above, reflect shape ***A*** in the line $x = -2$

**(2)**




(b) Describe fully the single transformation that will map shape ***A*** onto shape ***B***.

.....

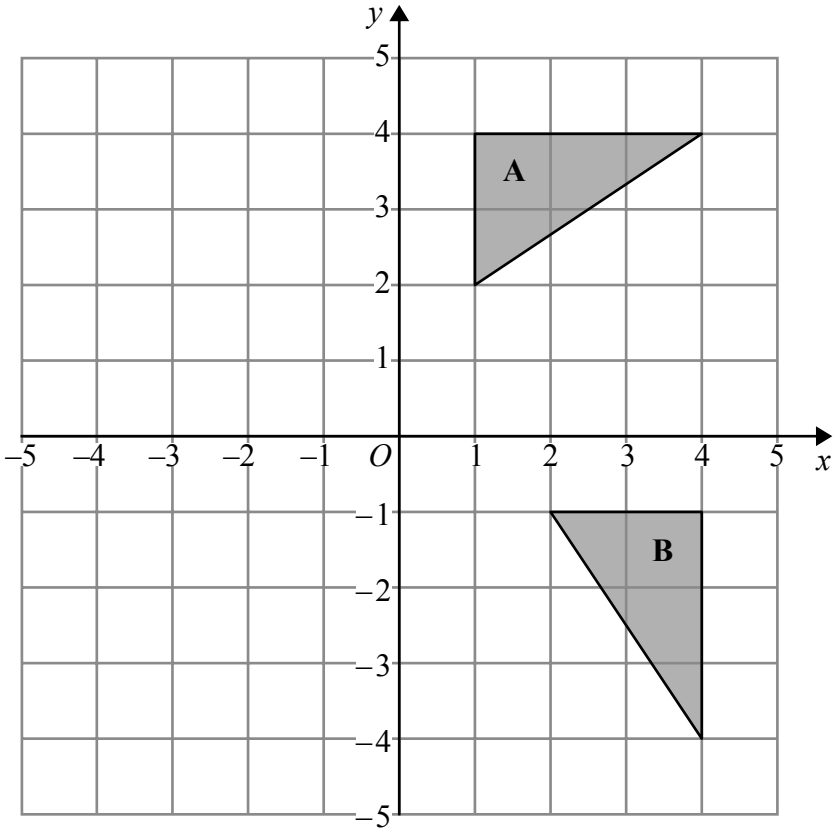
.....

**(2)**



**(Total for Question 14 is 4 marks)**

**15**



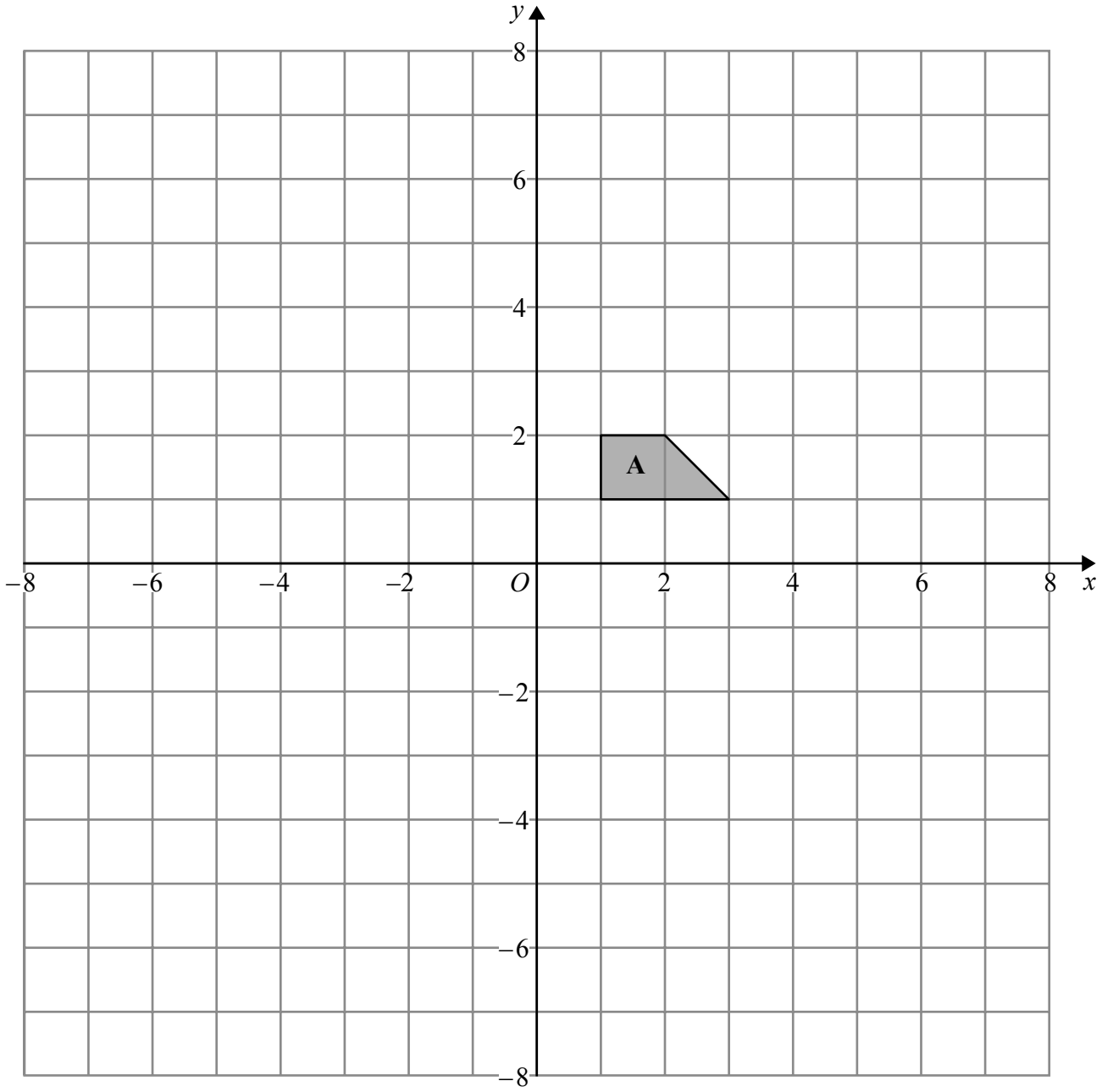

Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....

.....

**(Total for Question 15 is 2 marks)**

**16**




(a) Enlarge shape **A** by scale factor −2, centre (0, 0)
Label your image **B**.

**(2)**

(b) Describe fully the single transformation that will map shape **B** onto shape **A**.

.....

**(1)**

**(Total for Question 16 is 3 marks)**