

Transformation

GCSE MATHS

Name: _____

Teacher: _____

Learning objectives

By the end this pack you will be able to:

1. Recognise and carry out a translation
2. Describe a translation, using vector notation
3. Recognise and carry out a rotation
4. Describe a rotation giving angle, direction and centre of rotation
5. Recognise and carry out a reflection
6. Describe a reflection, giving the equation of the mirror line
7. Carry out a combination of transformation
8. Recognise and carry out an enlargement
9. Describe an enlargement giving a scale factor and if necessary a centre of enlargement

Key facts and definitions

Translation is _____

Information required _____

Enlargement is _____

Scale factor is _____

Centre of enlargement is _____

Reflection is _____

Line of reflection is _____

Rotation is _____

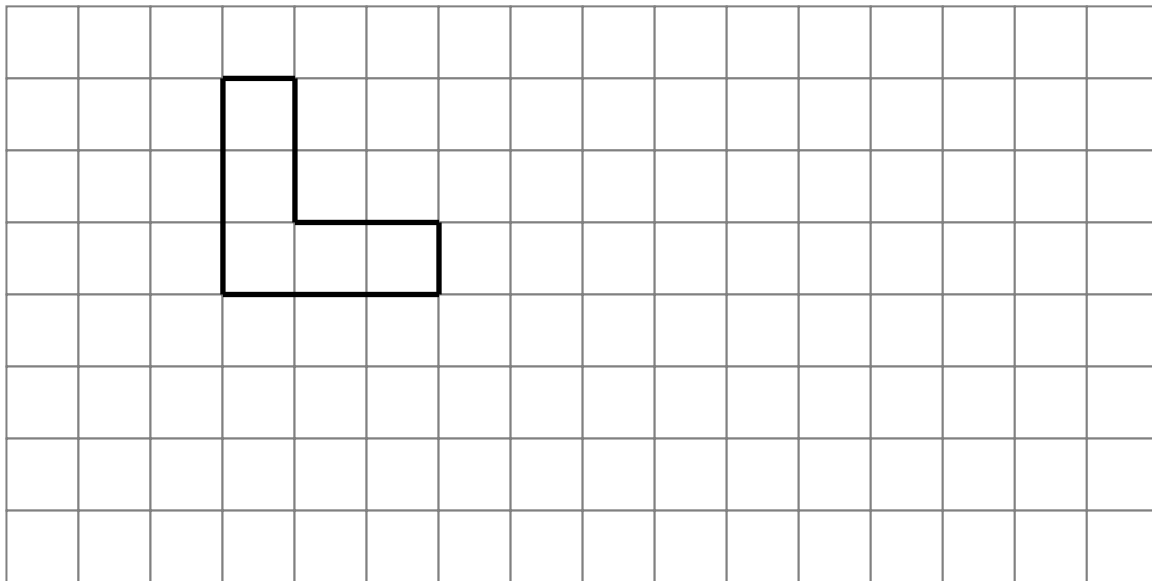
Centre of rotation is _____

Direction is _____

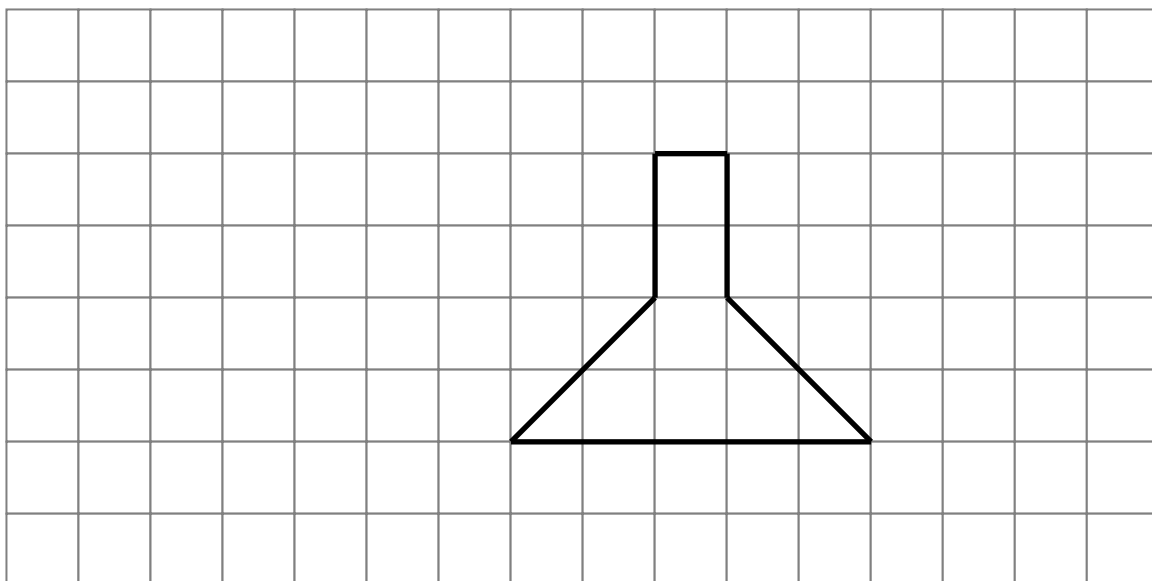
Translations! Translations!

Follow the instructions to translate each shape...

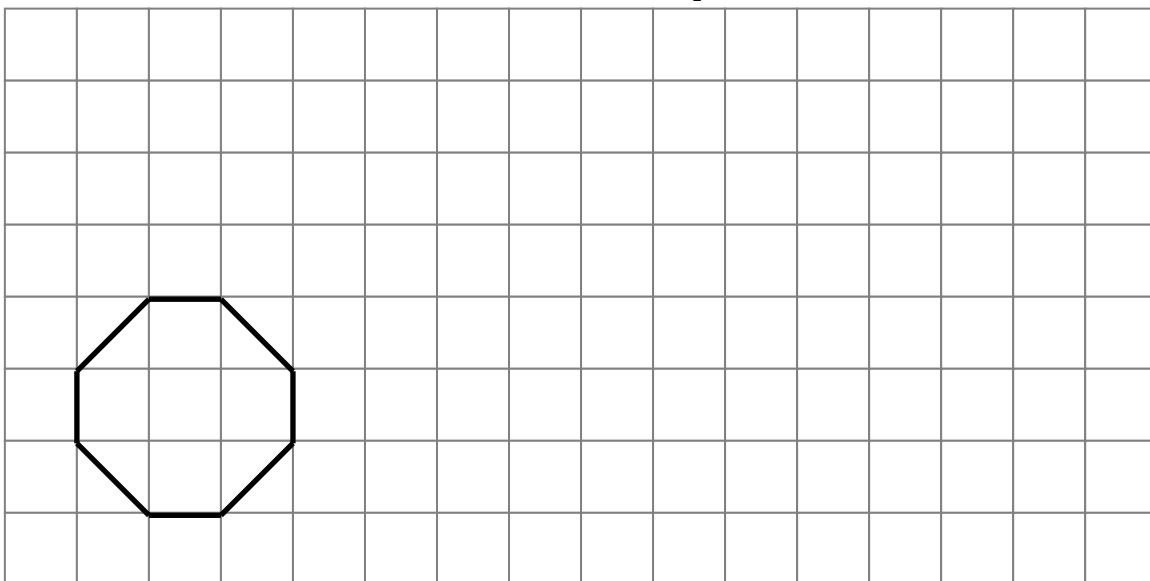
1. Translate the following shape with the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$:



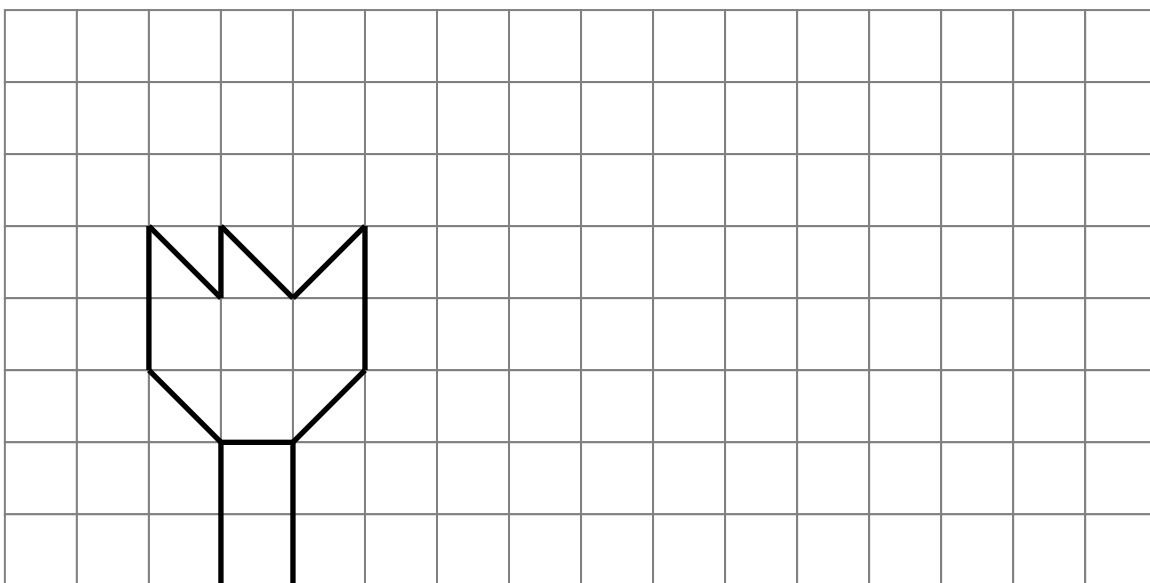
2. Translate the following shape with the vector $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$:



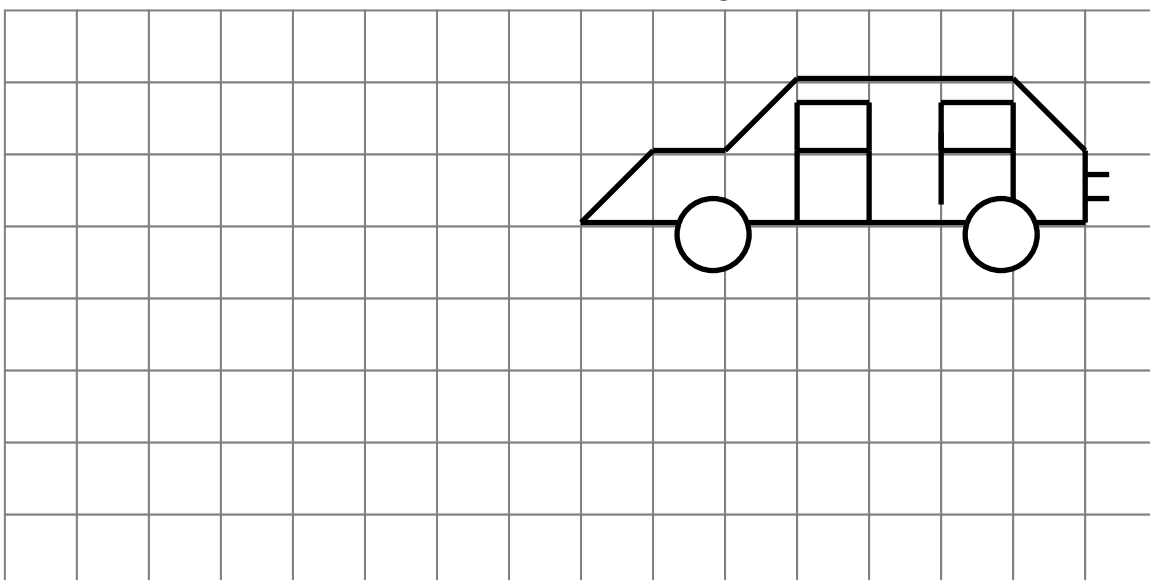
3. Translate the following shape with the vector $\begin{pmatrix} 8 \\ 4 \end{pmatrix}$:



4. Translate the following shape with the vector $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$:



5. Translate the following shape with the vector $\begin{pmatrix} -6 \\ -3 \end{pmatrix}$

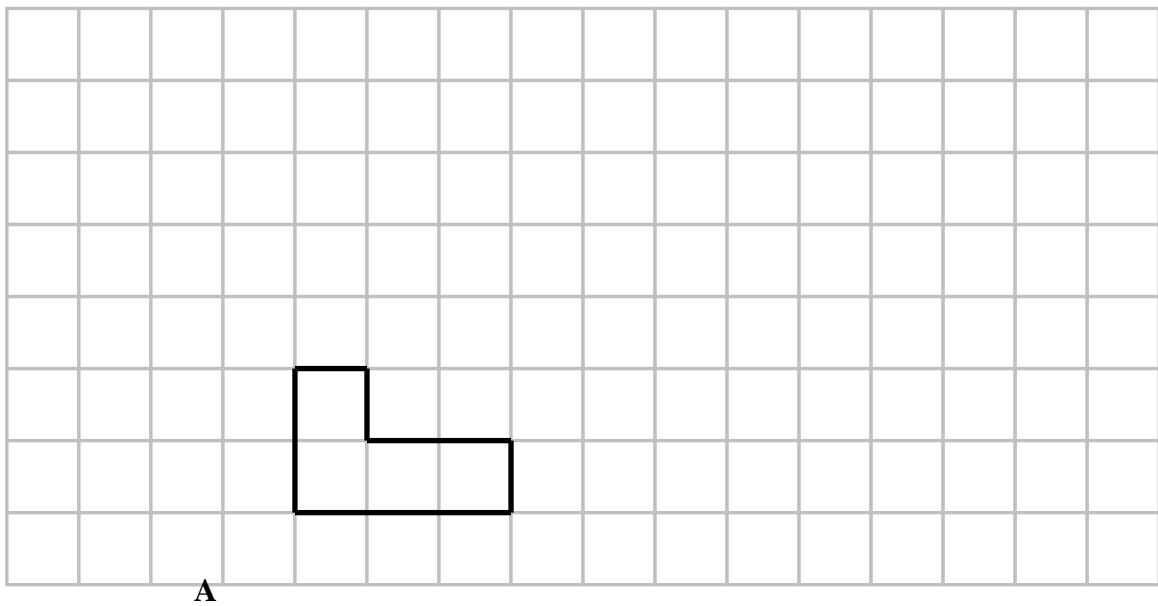


Enlargement Enlargement

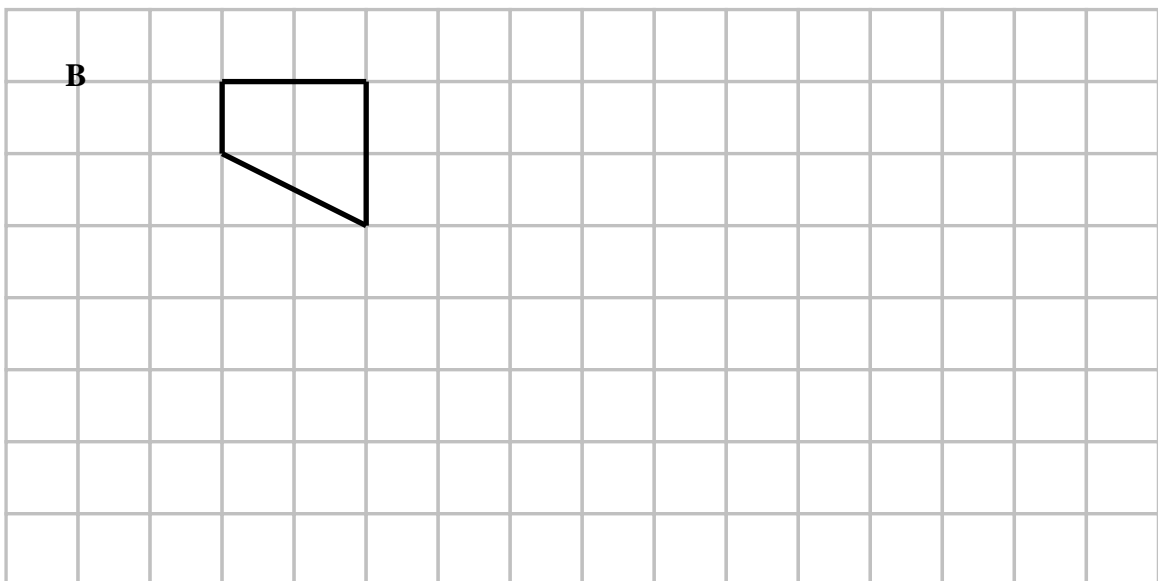
Enlargement is....

The scale factor is....

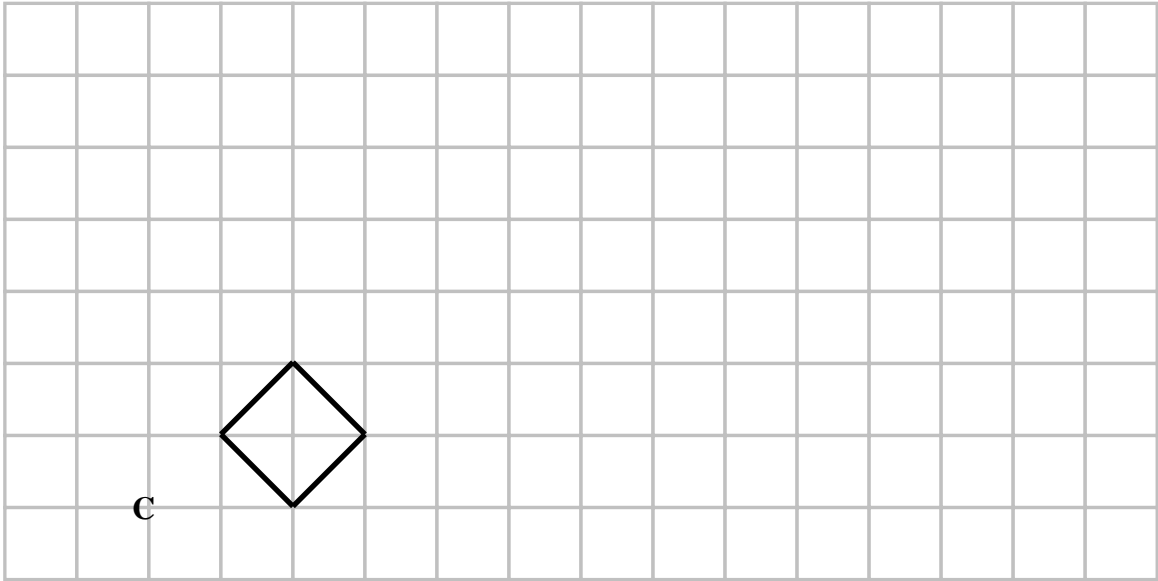
1. Enlarge the following shape, using A as the centre of enlargement, by a scale factor of 2:



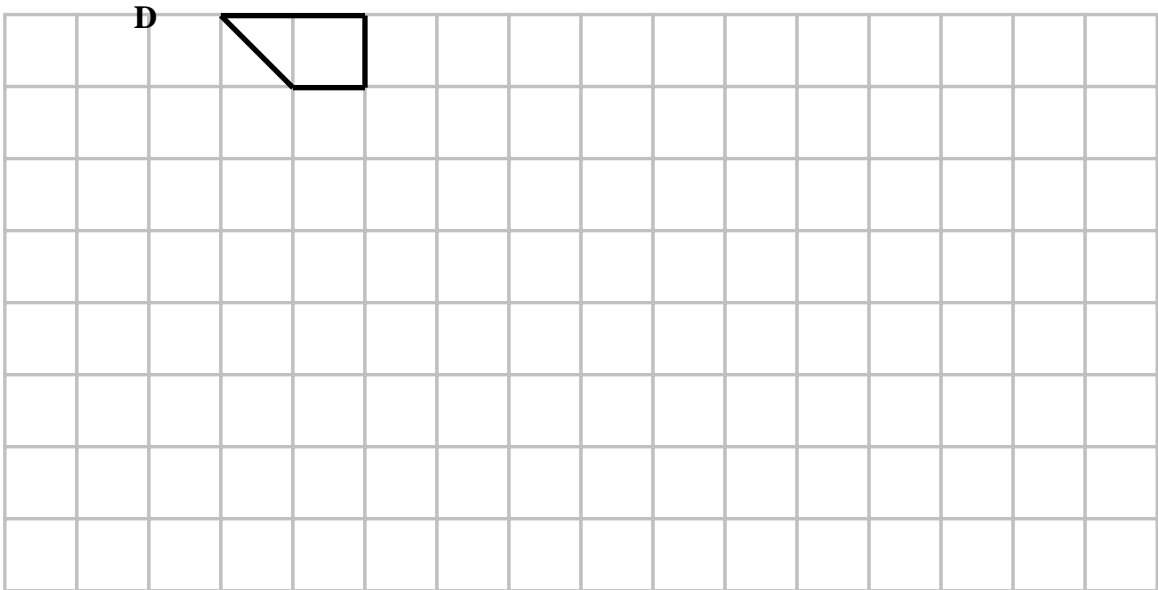
2. Enlarge the following shape, using B as the centre of enlargement, by a scale factor of 3:



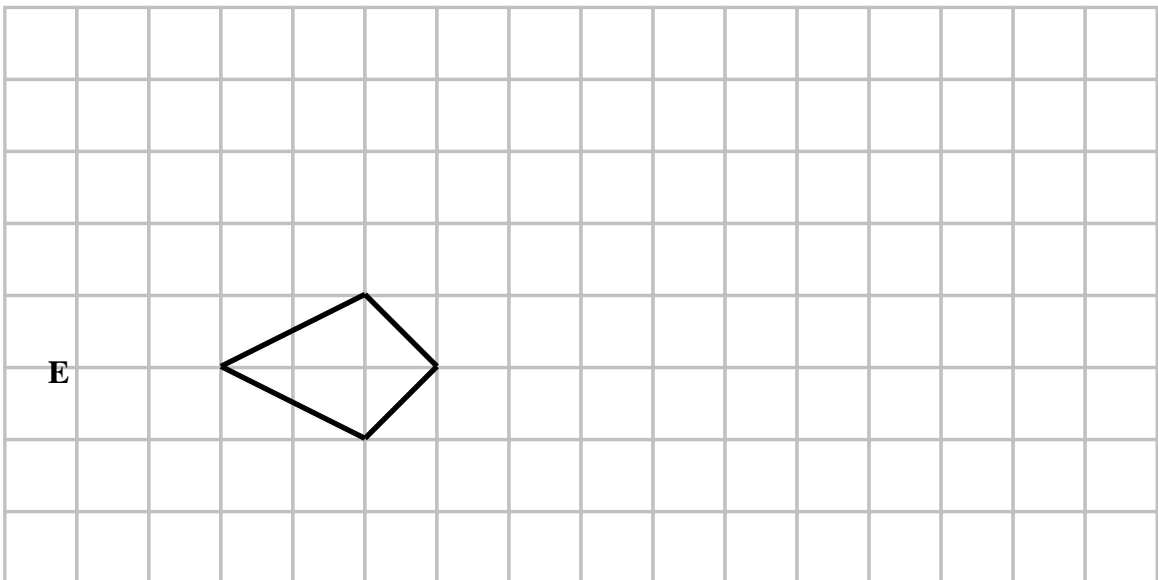
3. Enlarge the following shape, using C as a centre of enlargement, with scale factor



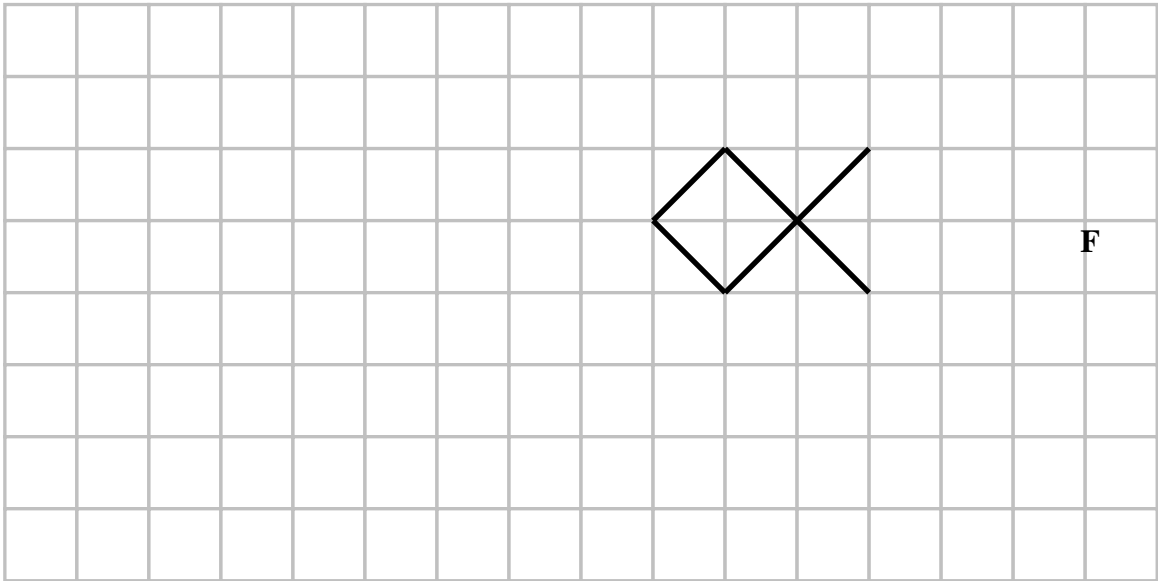
4. Enlarge the following shape, using D as the centre of enlargement, with scale factor 4:



5. Enlarge the following shape, using E as the centre of enlargement, with scale factor 2:



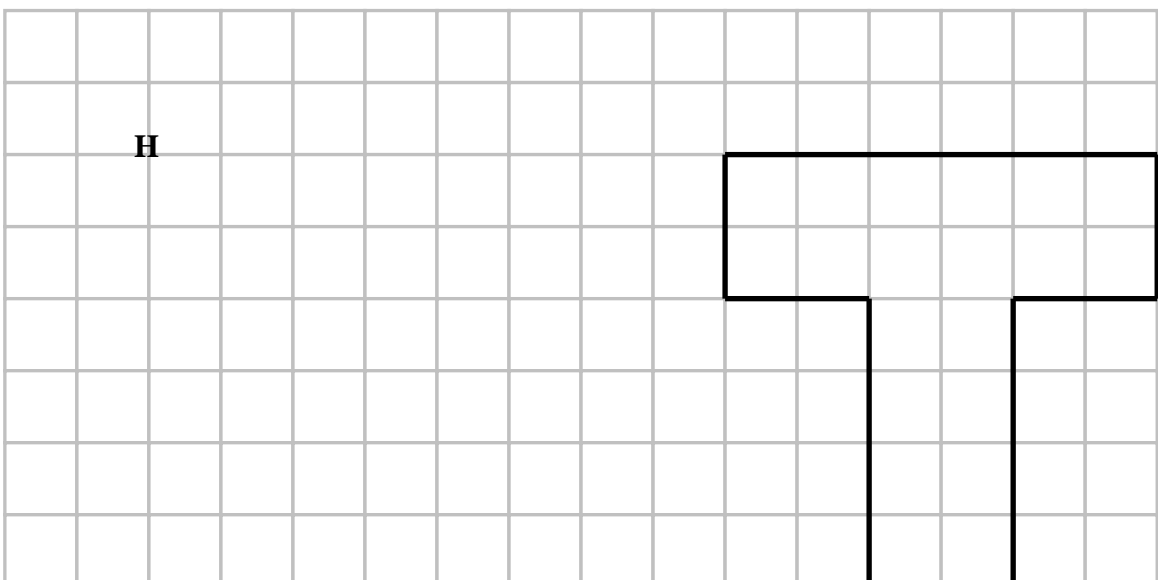
6. Enlarge the following shape, using F as the centre of enlargement, with scale factor 2:



7. Enlarge the following shape, using G as the centre of enlargement, with scale factor 3:

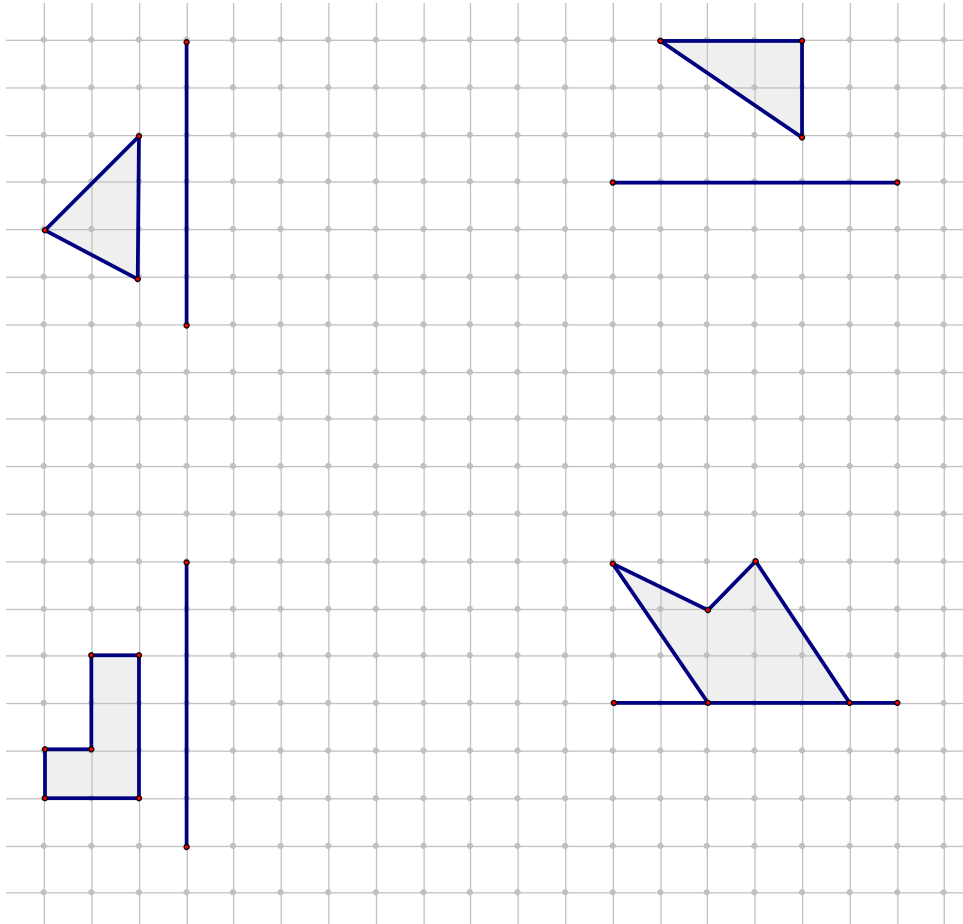


8. Enlarge the following shape, using H as the centre of enlargement, with scale factor $\frac{1}{2}$:

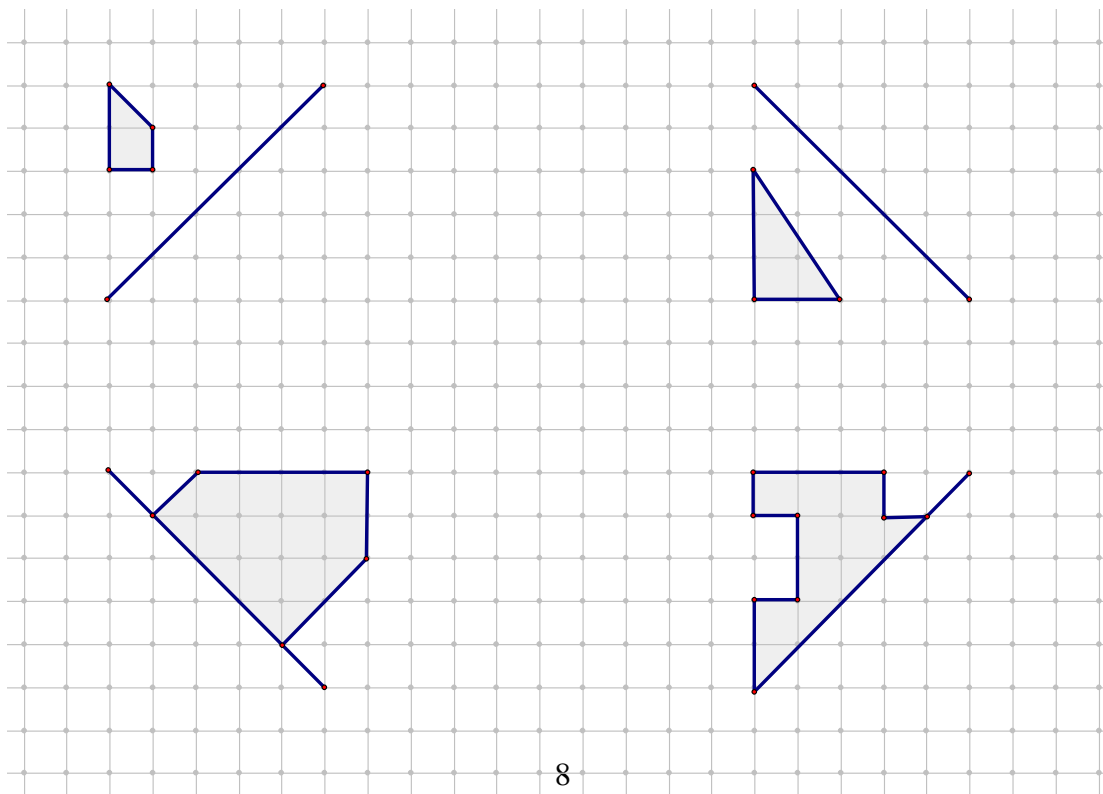


REFLECTION

Reflect these shapes in the given mirror lines (use a pencil and a ruler!):



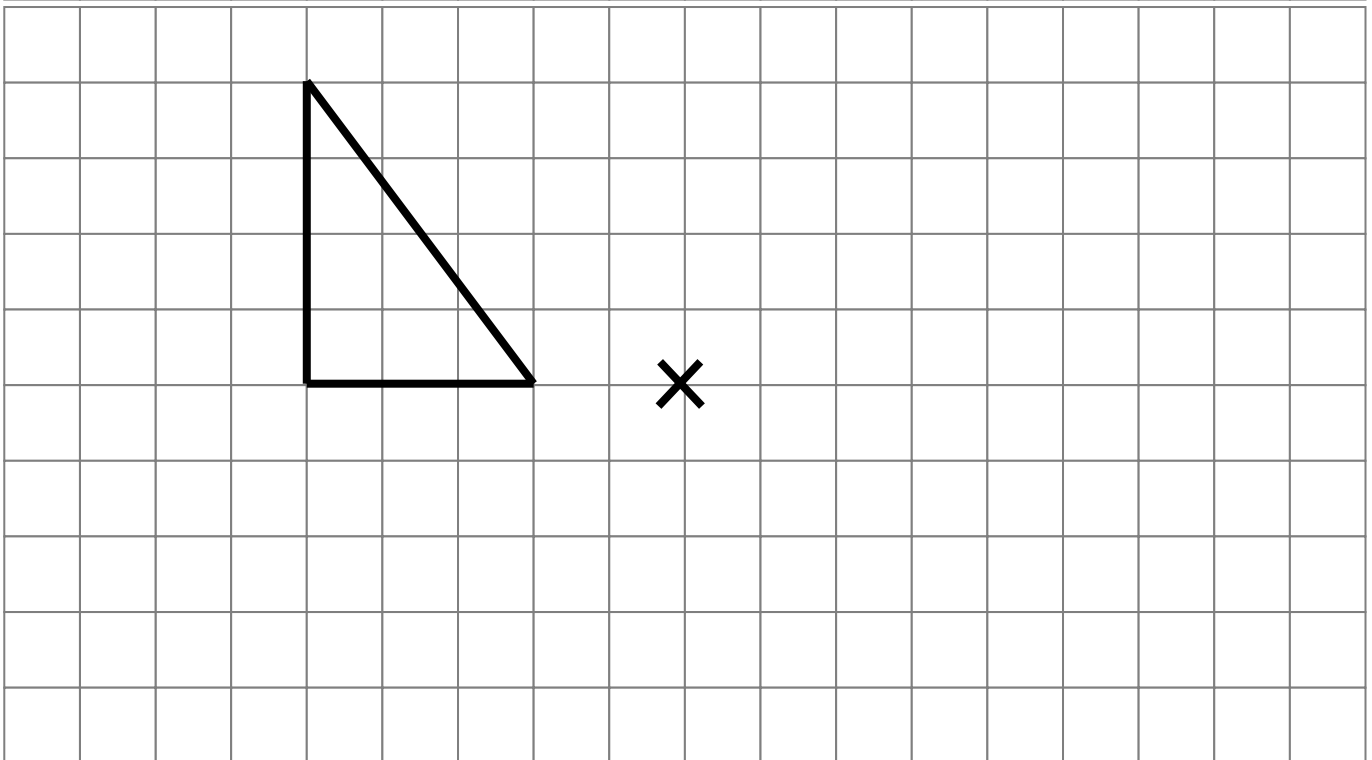
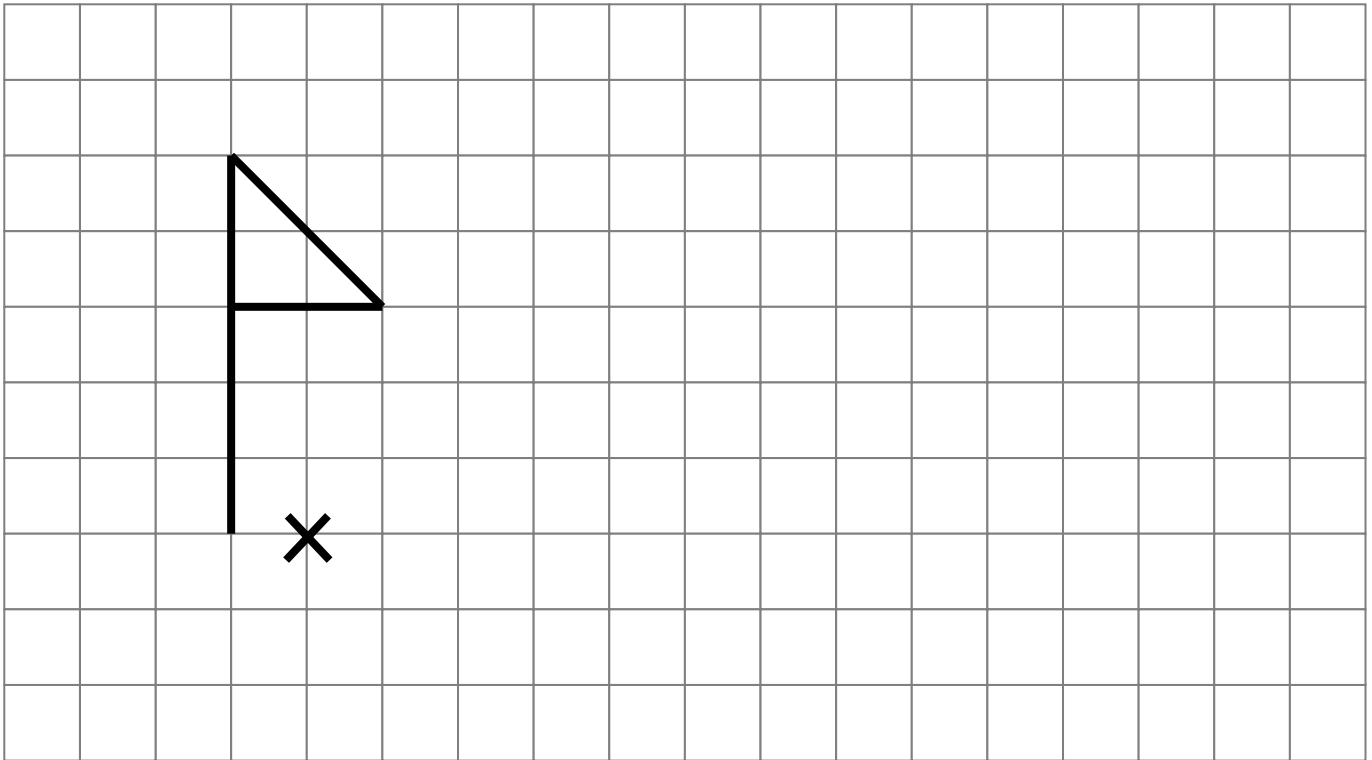
How about these shapes?



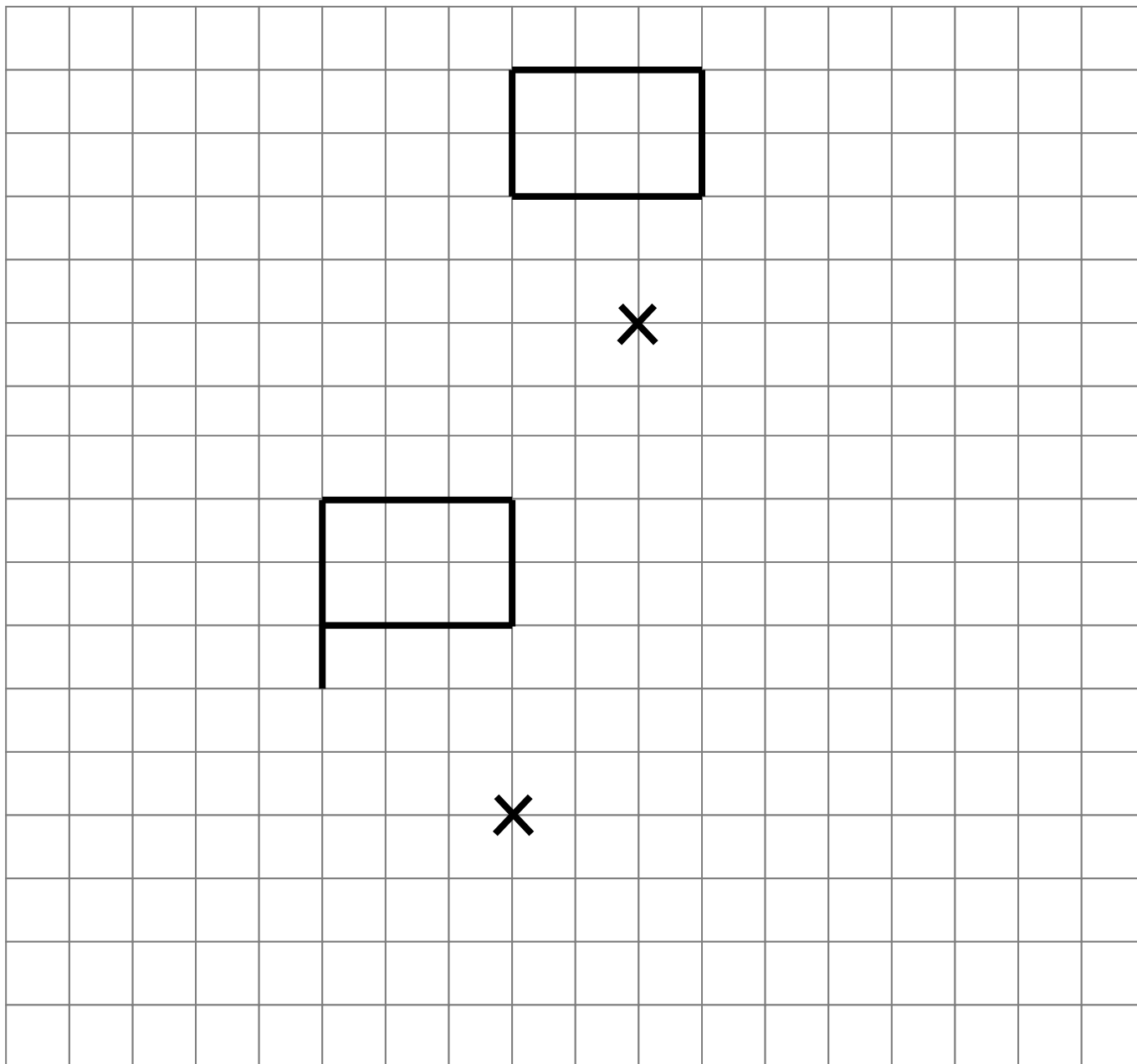
Rotation



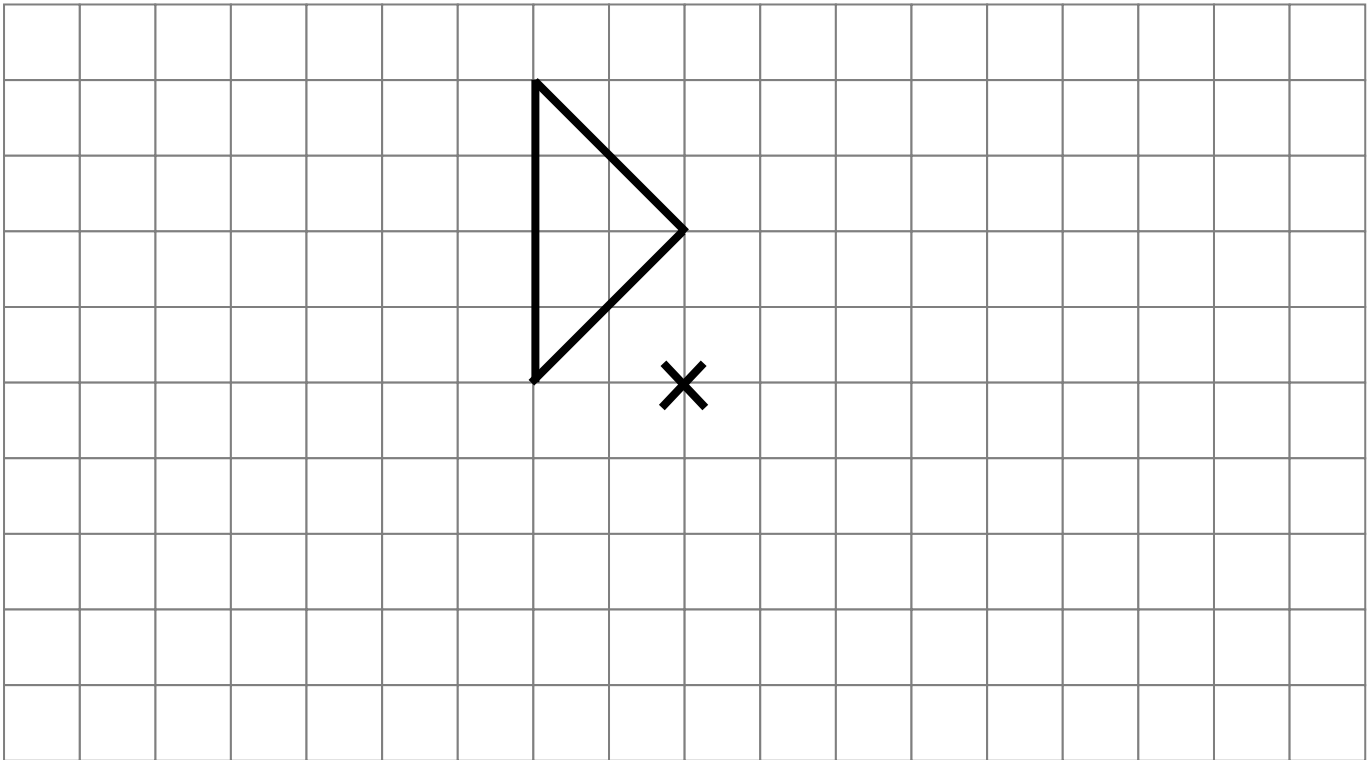
Rotate the shape through 90° clockwise, using x as the centre of rotation:



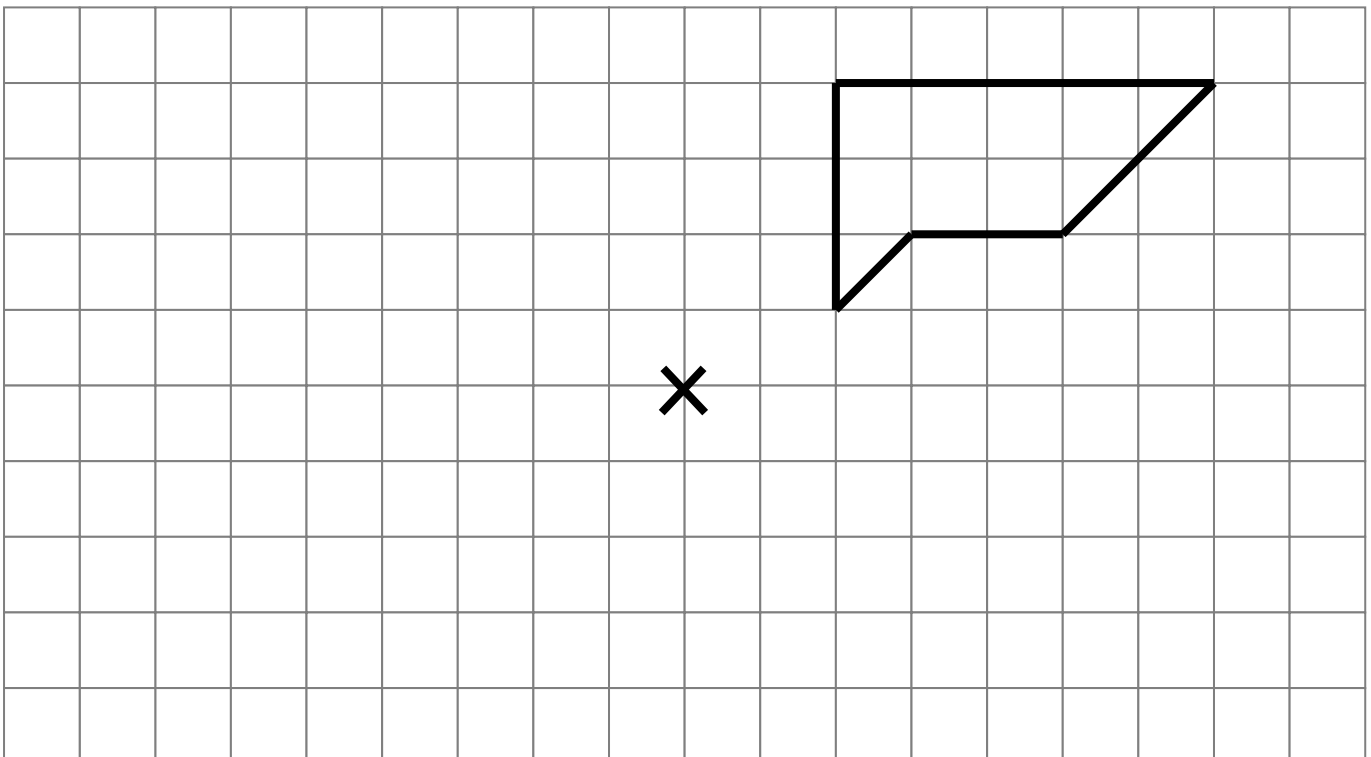
Rotate this shape through 90° anticlockwise, using x as the centre of rotation:



Rotate this shape through 90° clockwise, using x as the centre of rotation:



Rotate this shape through 180° anticlockwise, using x as the centre of rotation:



Edexcel GCSE Mathematics (Linear) – 1MA0

MIXED TRANSFORMATIONS

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil



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 be used.

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.

Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

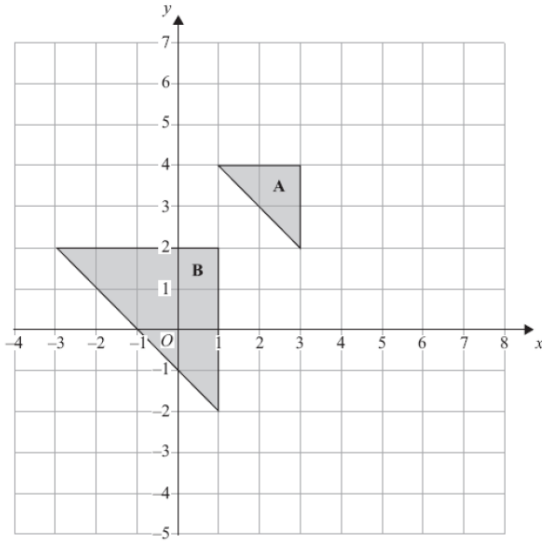
Read each question carefully before you start to answer it.

Keep an eye on the time.

Try to answer every question.

Check your answers if you have time at the end.

1.



Triangle A and triangle B are drawn on the grid.

(a) Describe fully the single transformation which maps triangle A onto triangle B.

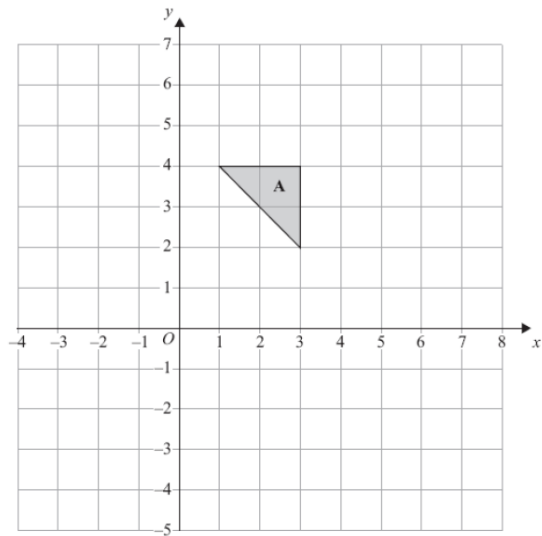
.....

.....

(3)

.....

(3)

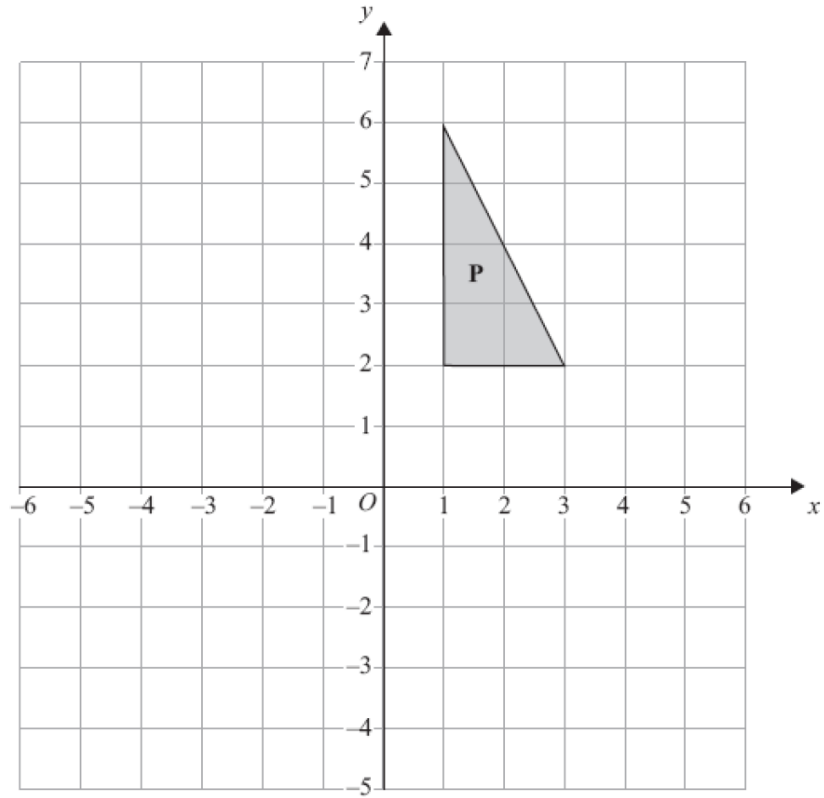


(b) Reflect triangle A in the line $x = 4$

(2)

(5 marks)

2.



Triangle **P** is drawn on a coordinate grid.

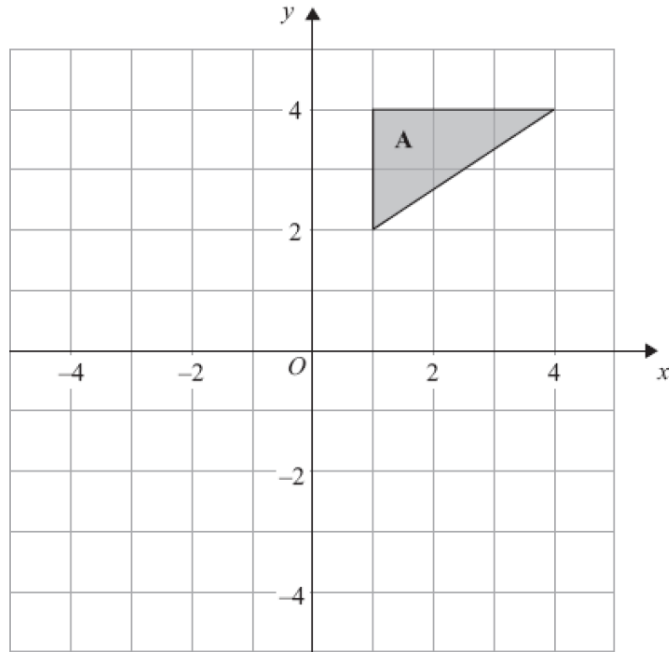
The triangle **P** is reflected in the line $x = -1$ and then reflected in the line $y = 1$ to give triangle **Q**.

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

.....
.....

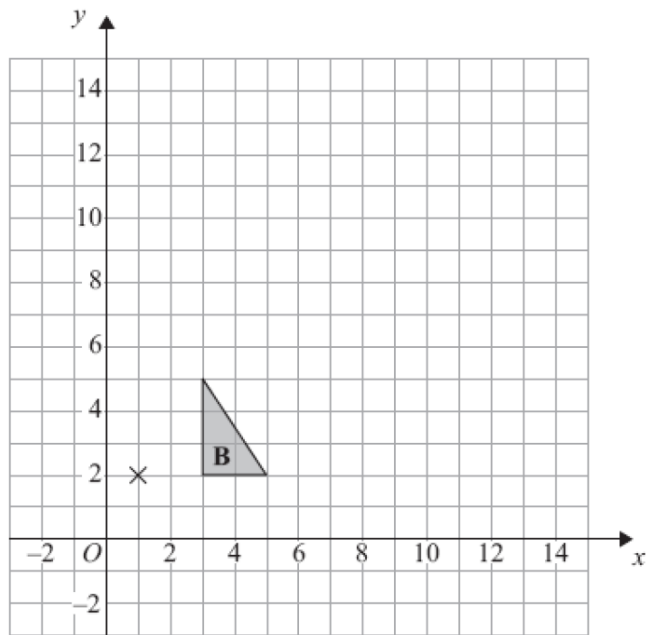
(3 marks)

3.



(a) Rotate triangle **A** 90° clockwise, centre O .

(2)

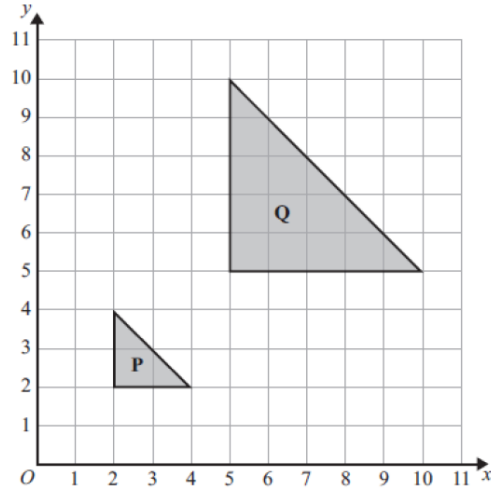


(b) Enlarge triangle **B** by scale factor 3, centre $(1, 2)$.

(3)

(5 marks)

4.

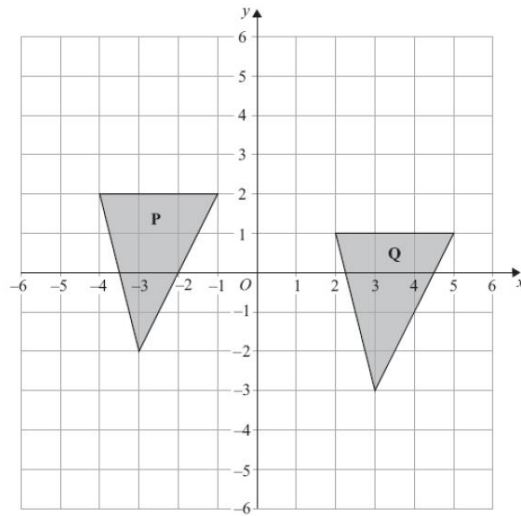


Describe fully the single transformation that maps shape **P** onto shape **Q**.

.....
.....

(3 marks)

5.

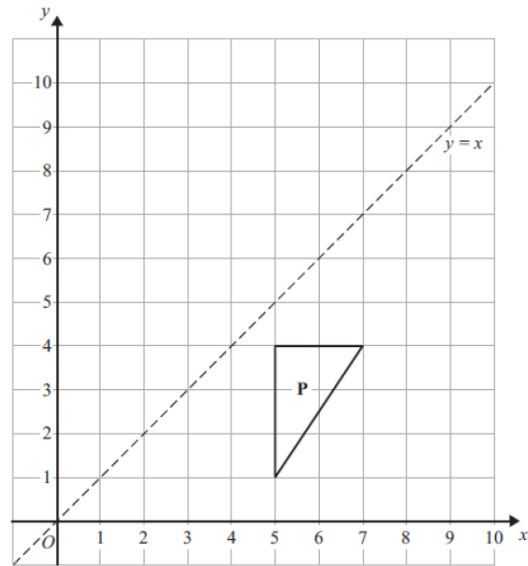


Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

.....
.....

(3 marks)

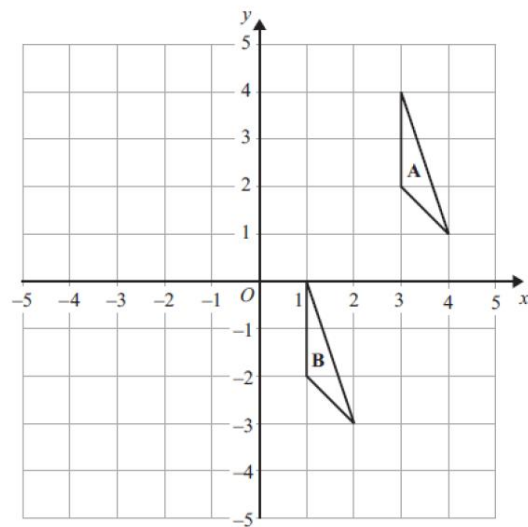
6. (a)



Reflect shape P in the line $y = x$

(2)

(b)



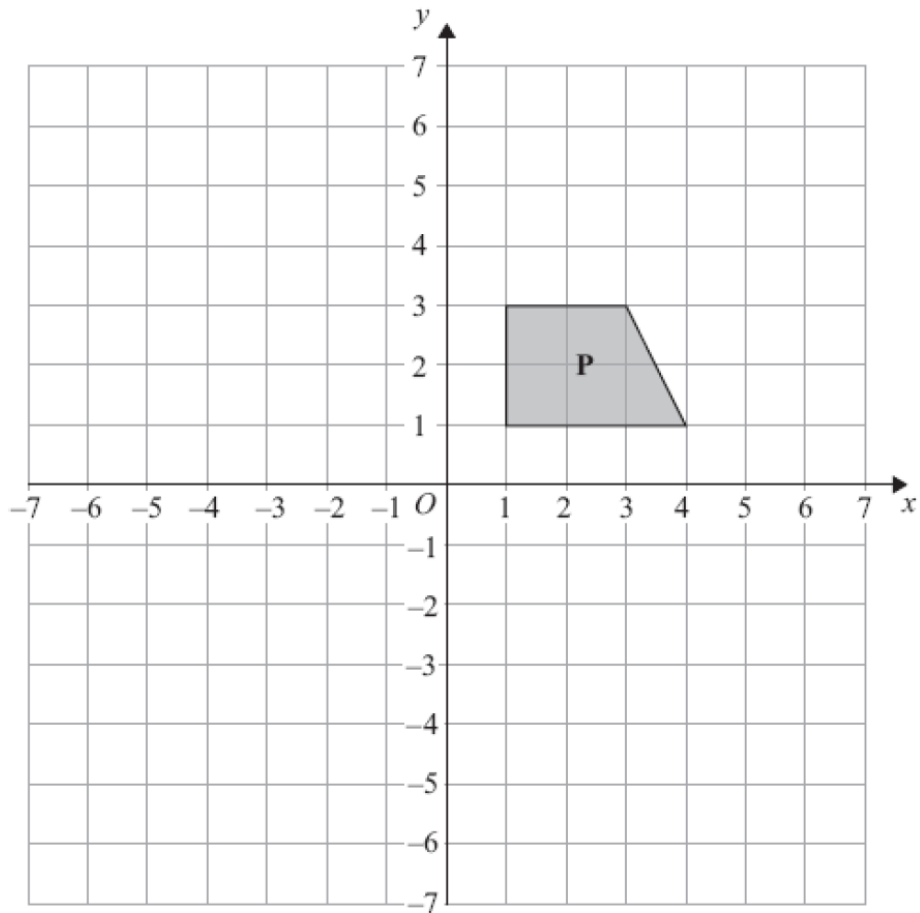
Describe fully the single transformation that maps triangle A onto triangle B.

.....

(2)

(4 marks)

7.



Shape **P** is reflected in the line $x = -1$ to give shape **Q**.

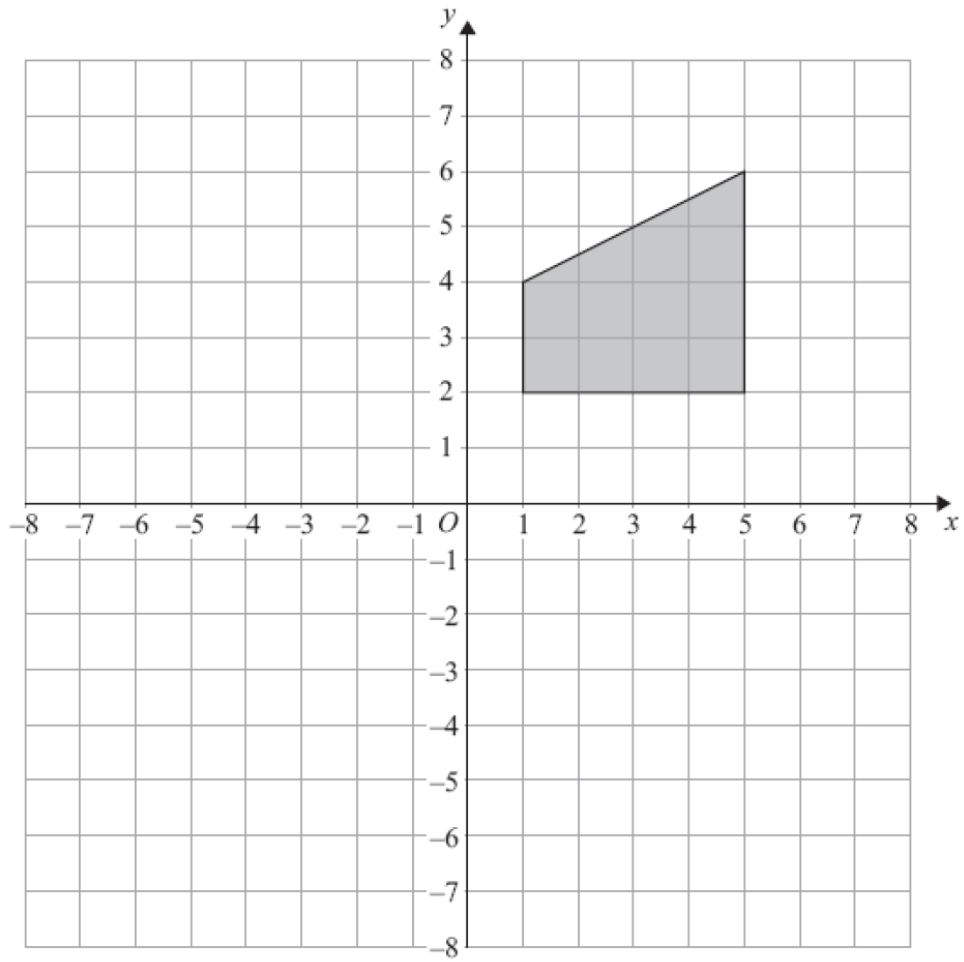
Shape **Q** is reflected in the line $y = 0$ to give shape **R**.

Describe fully the **single** transformation that maps shape **P** onto shape **R**.

.....
.....

(3 marks)

8.



Rotate the shaded shape 90° clockwise about the point (1, -1).

(3 marks)
