

Transformation



By Kru ชี

Types of transformations

1. Translation

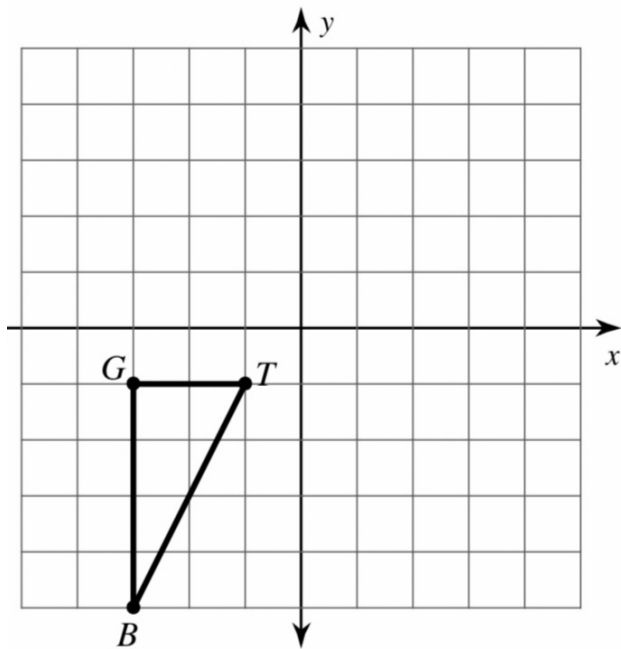
2. Reflection

3. Rotation

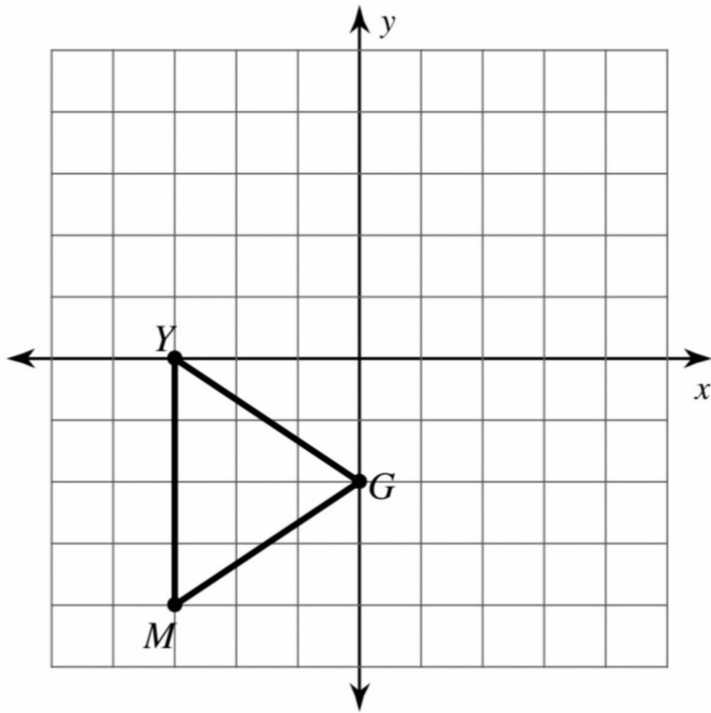
4. Enlargement (positive & negative scale factor)

Translation

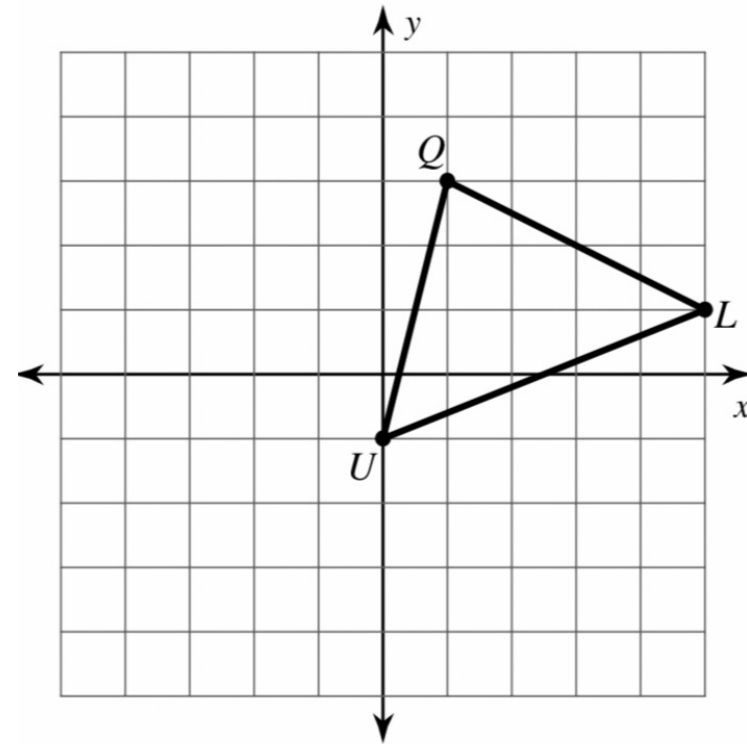
translation: 5 units right and 1 unit up



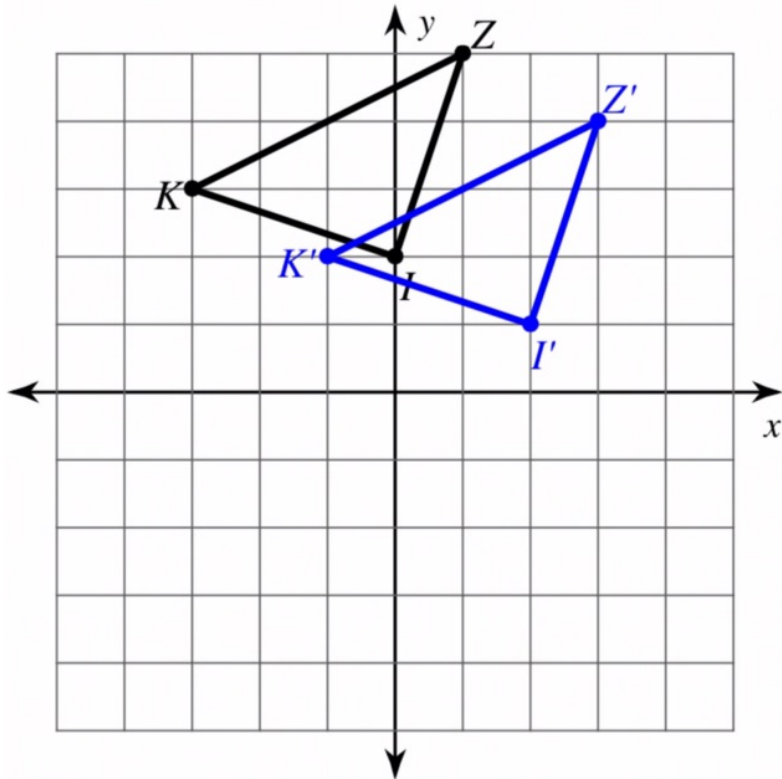
translation: 1 unit left and 2 units up

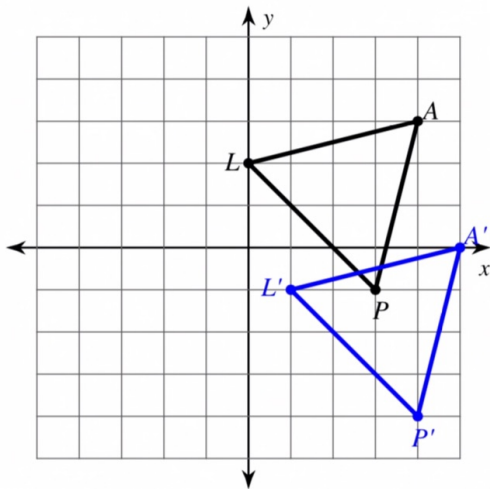
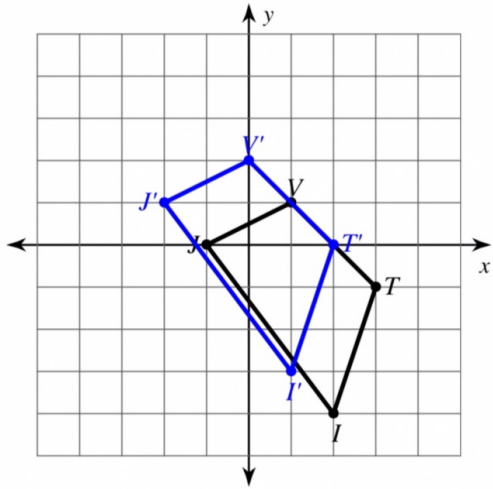


translation: 3 units down

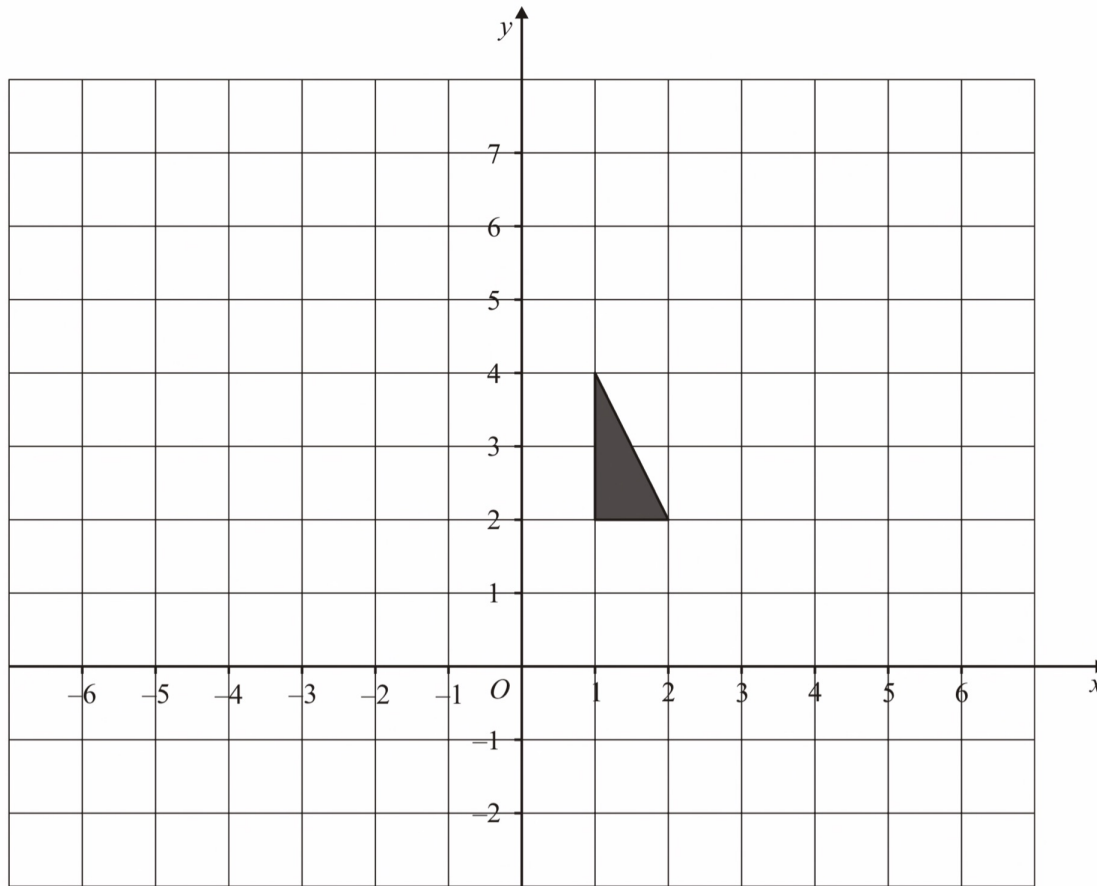


Describe the transformation of the black shape to its image (blue shape)

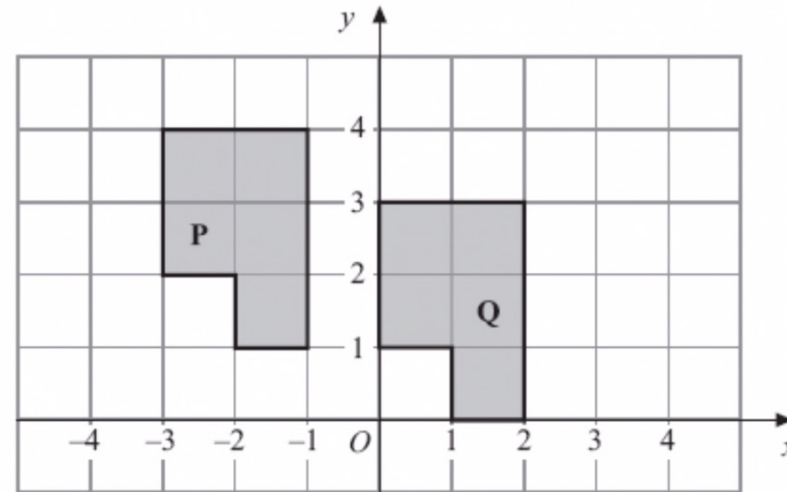




Describe translation by column vectors



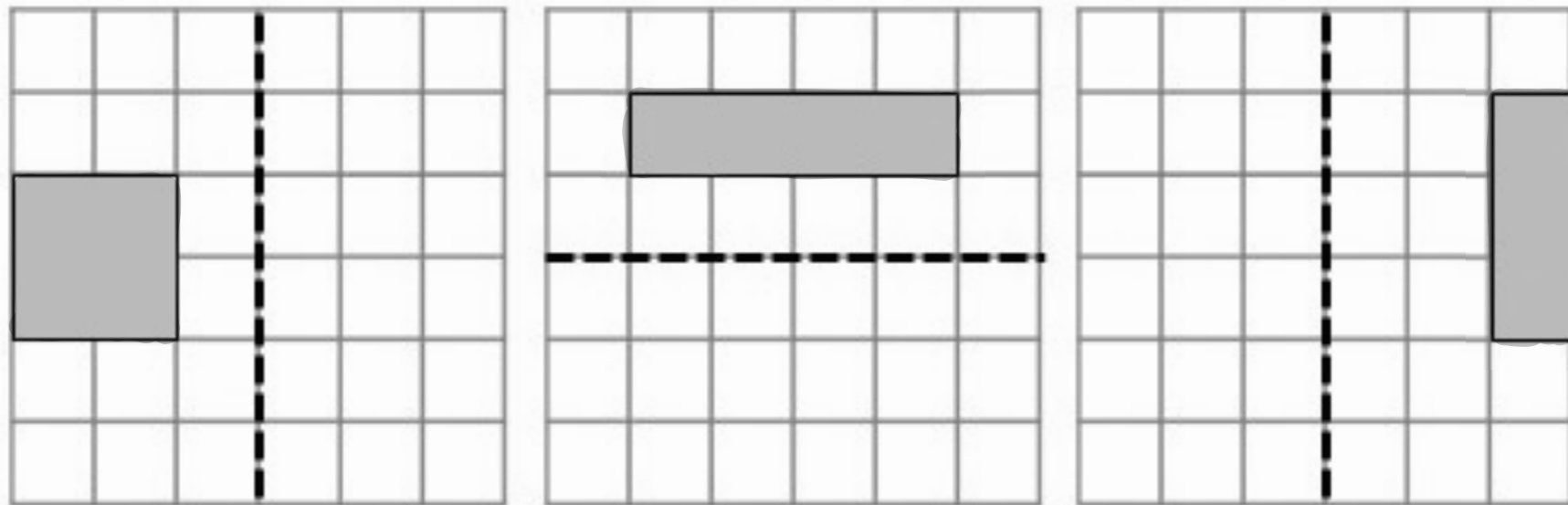
Translate this shape by vector $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$

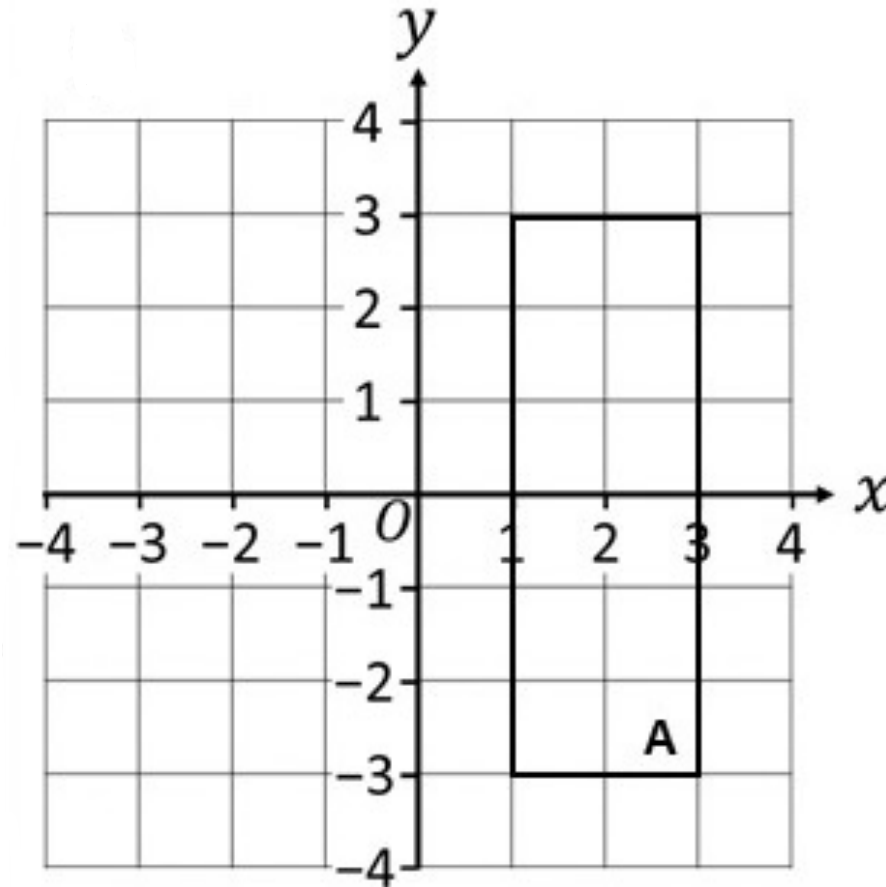


Describe fully the single transformation that will map shape **P** onto shape **Q**.

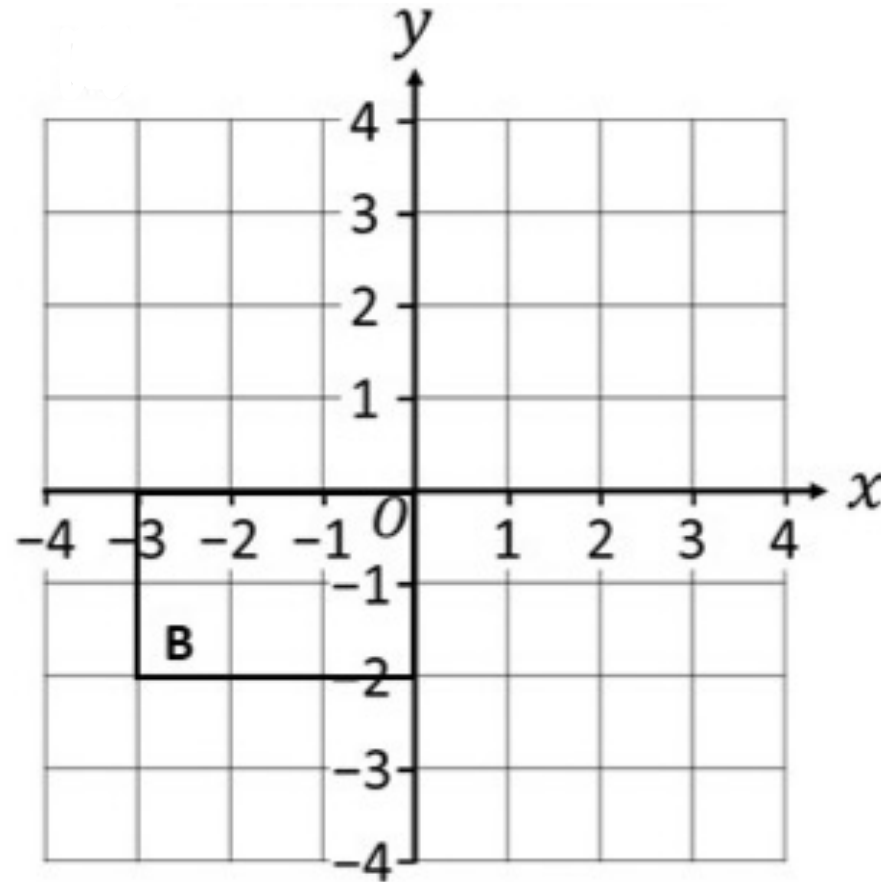
Reflection

Reflection is a type of transformation that flips a shape in a mirror line (also called a line of reflection) so that each point is the same distance from the mirror line as its reflected point.



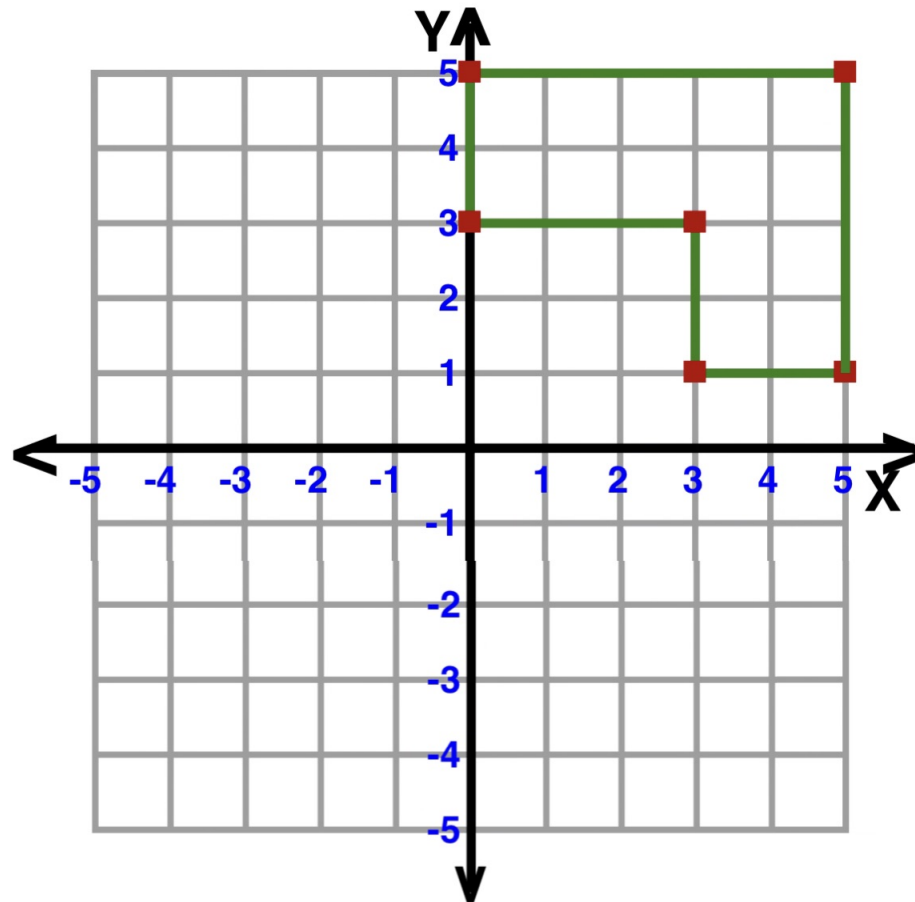


Reflect Shape **A** in the y axis.

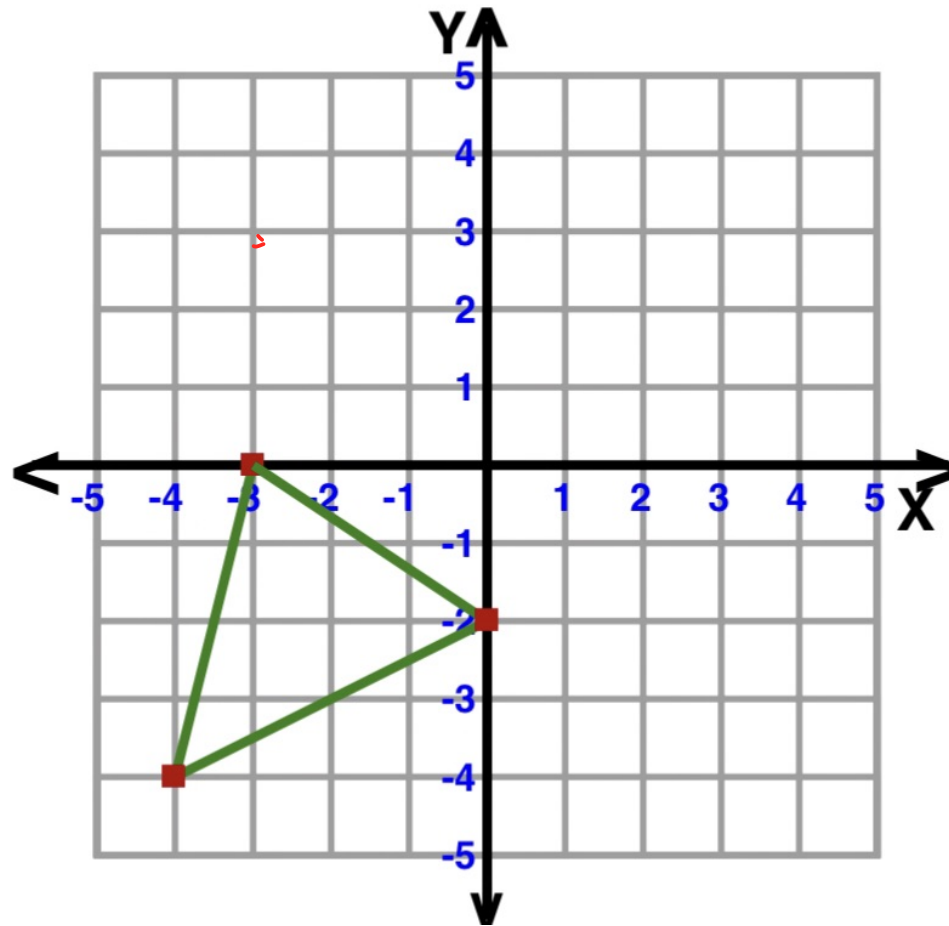


Reflect Shape **B** in the line $y = 1$

Reflection: Across Line $y = x$



Reflection: Across Line $y = -x$



Rotation

Rotation is transformation that turn a shape around a fixed point

To rotation a shape we need

1. A centre of rotation
2. An angle of rotation
3. The direction of rotation

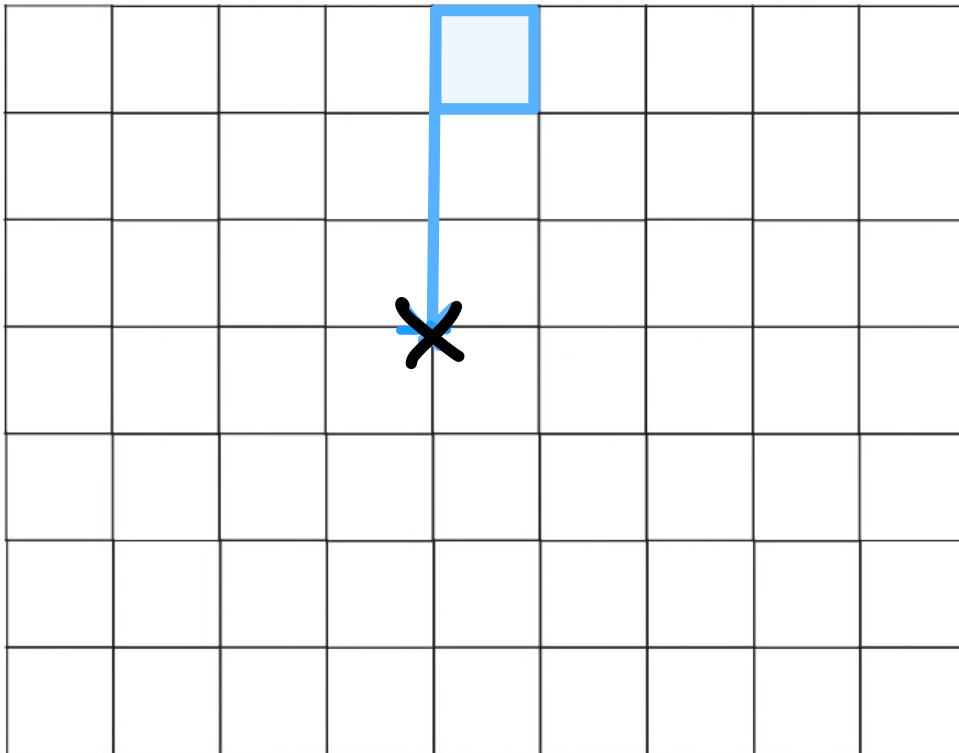


Clockwise

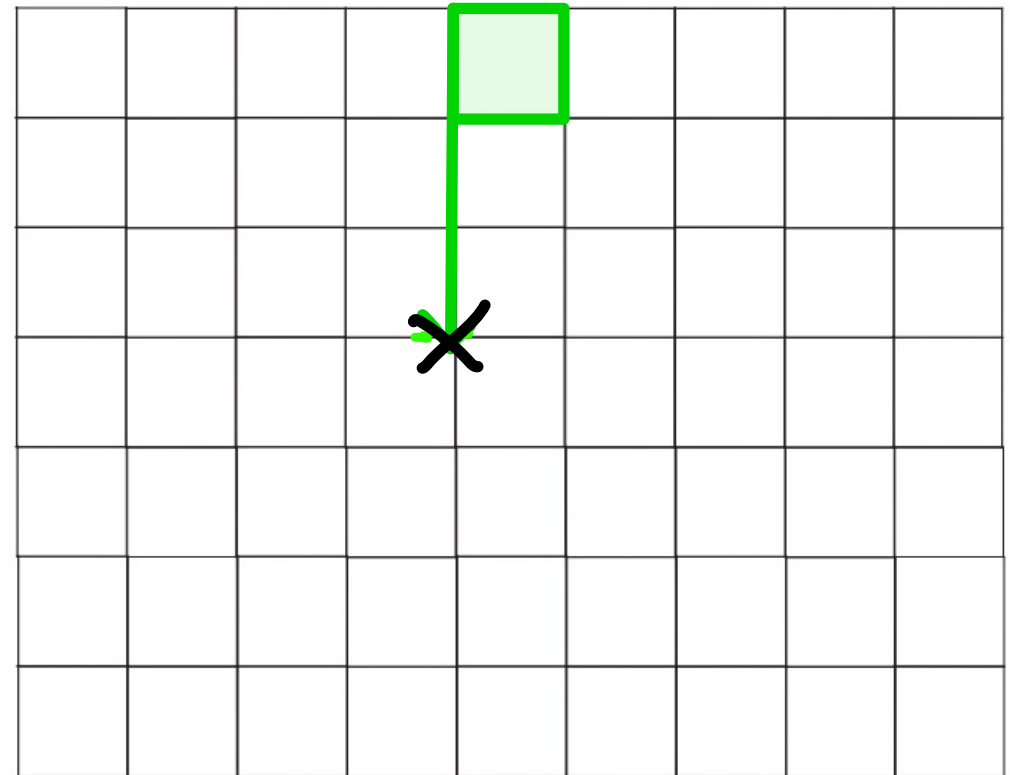


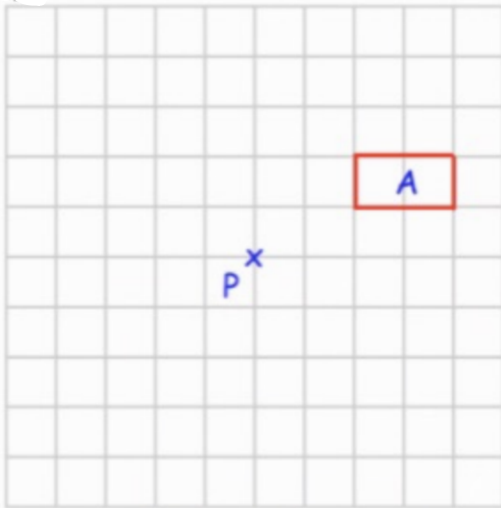
Anti-clockwise

Clockwise

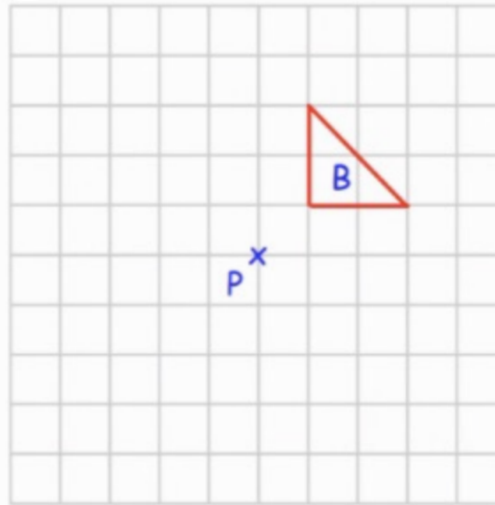


Anti-clockwise

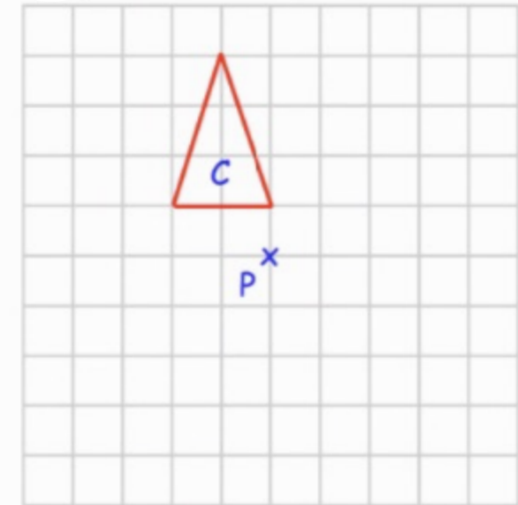




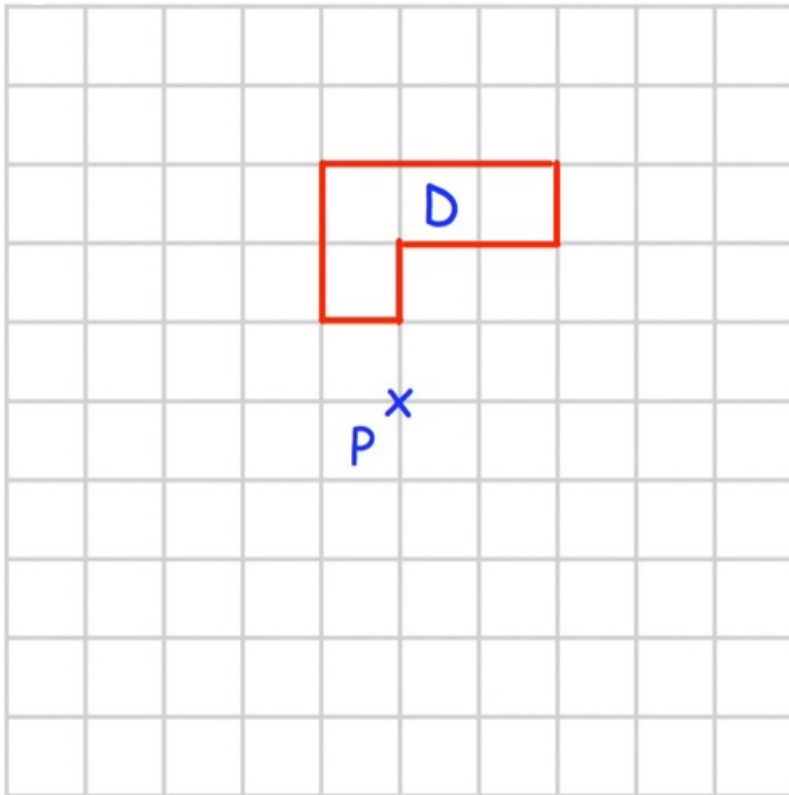
rotate 90° clockwise about P



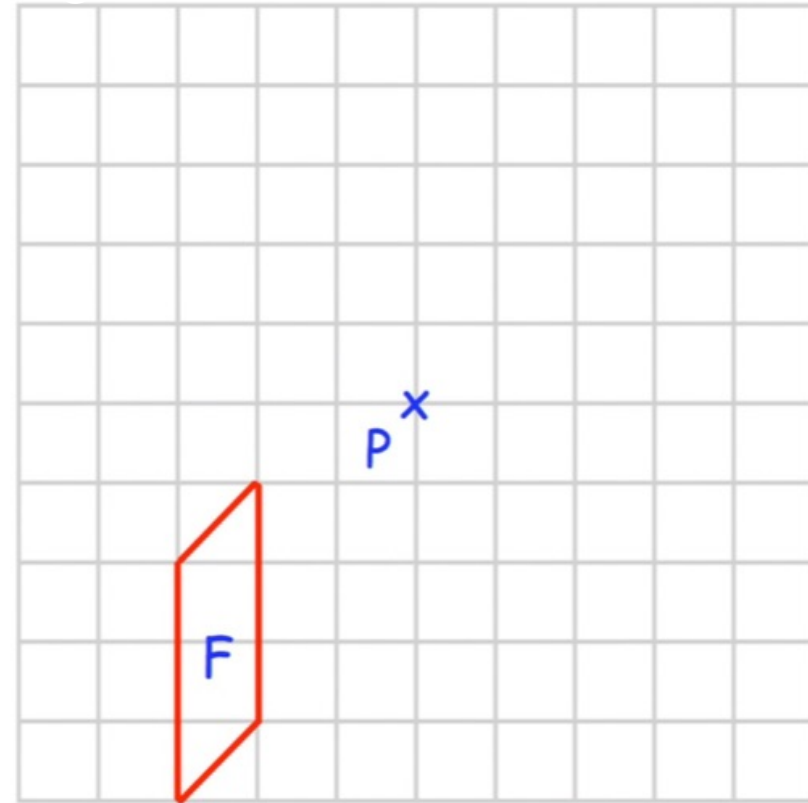
rotate 90° anticlockwise about P



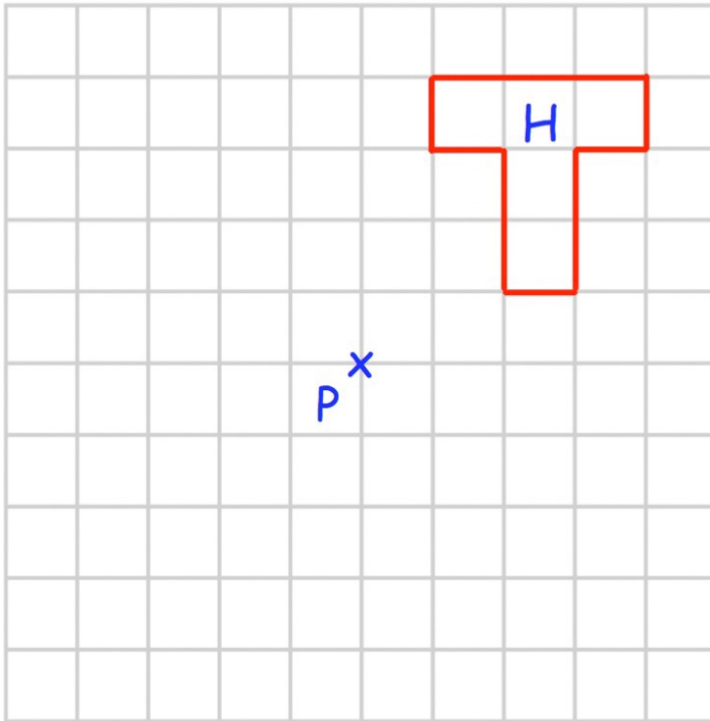
rotate 90° clockwise about P



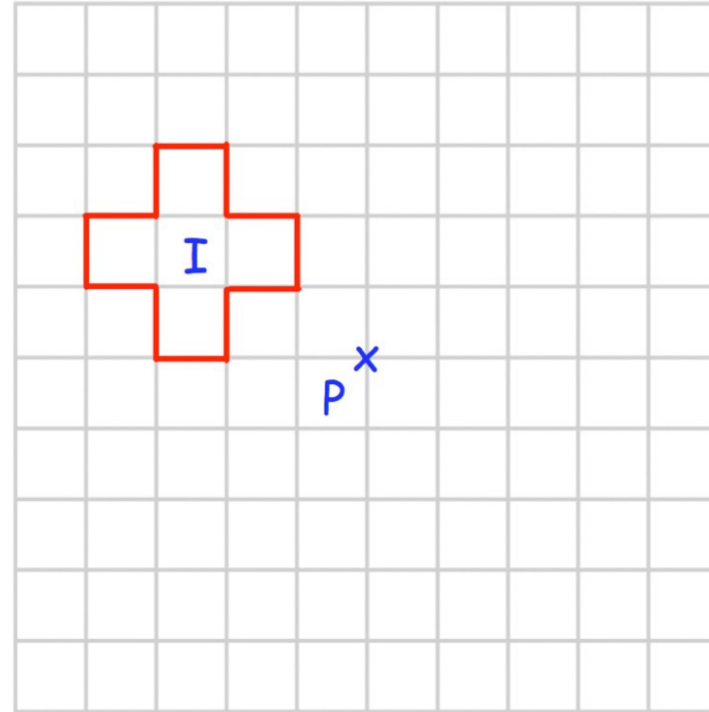
rotate 180° about P



rotate 180° about P

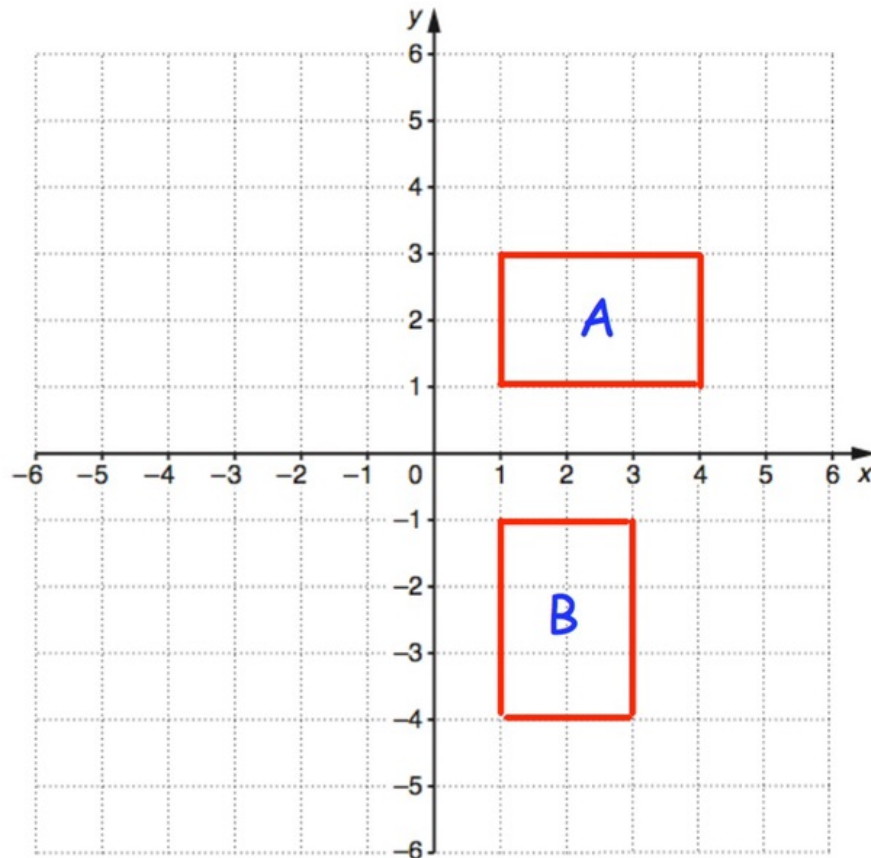


rotate 270° clockwise about P



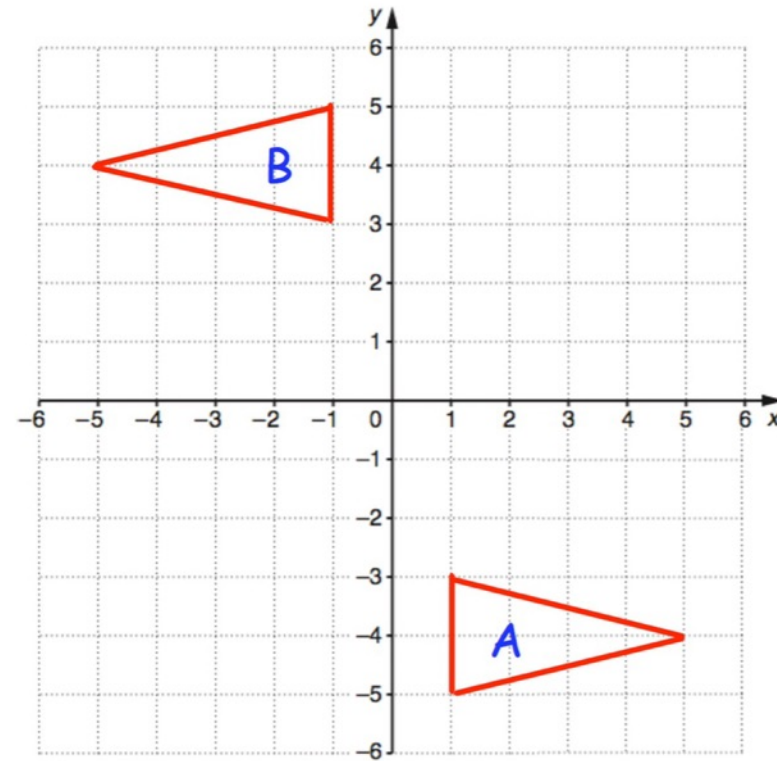
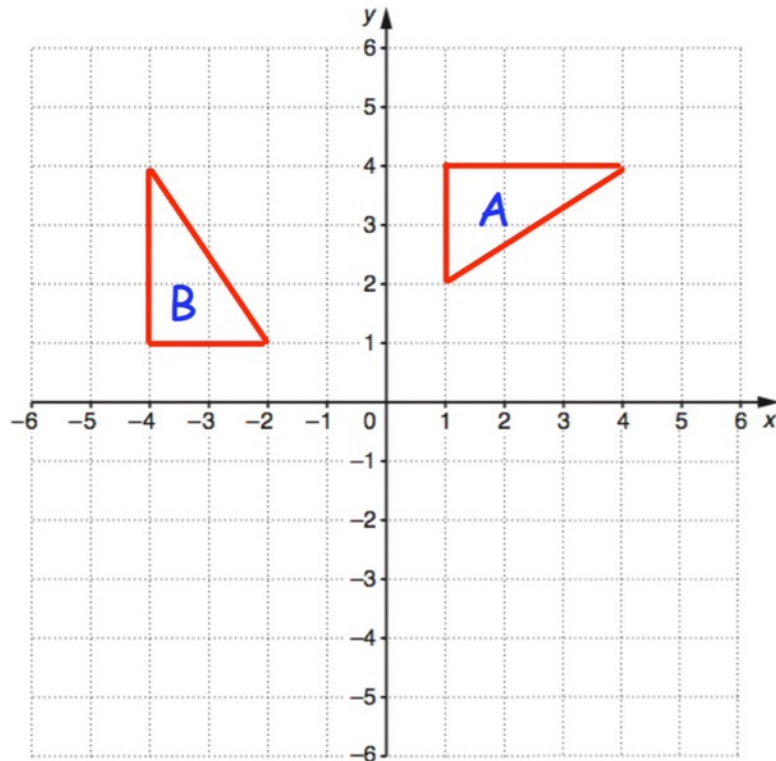
rotate 270° anticlockwise about P

Describe fully the single transformation that takes shape A to shape B.



***YOU NEED TO FIND
CENTRE OF ROTATION***

Describe fully the single transformation that takes shape A to shape B.

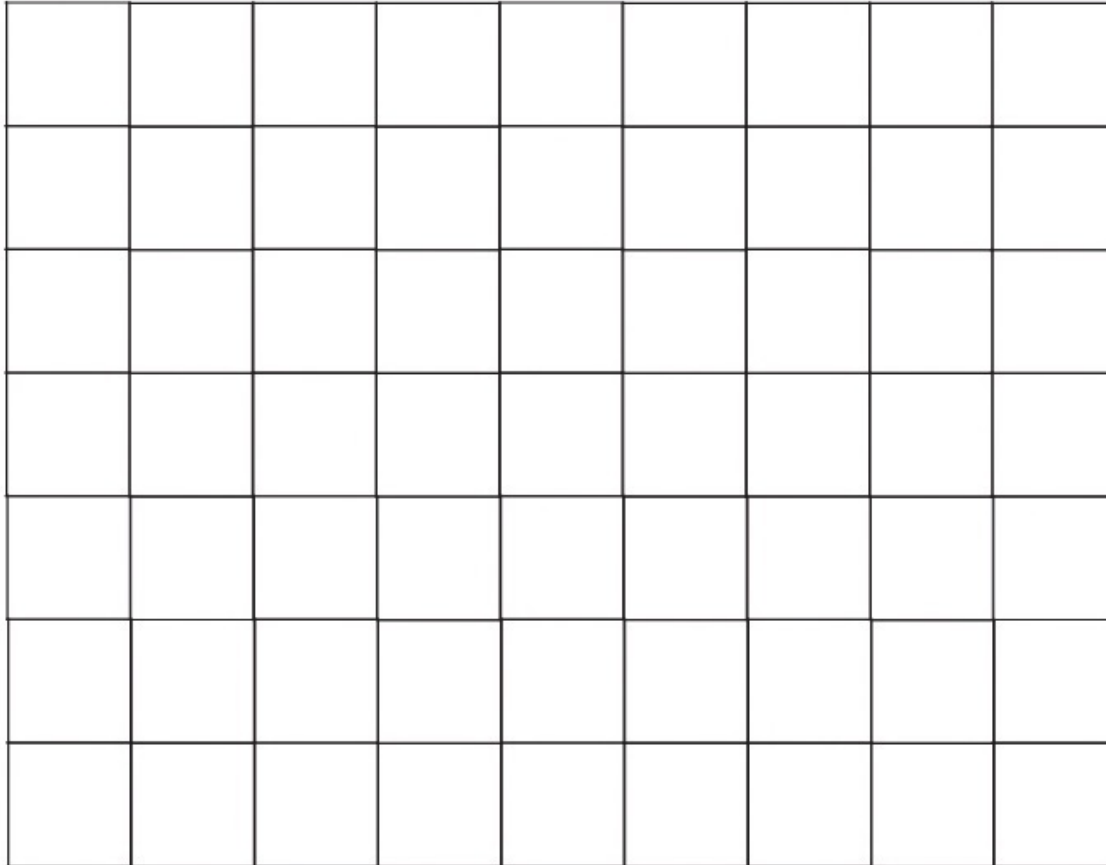


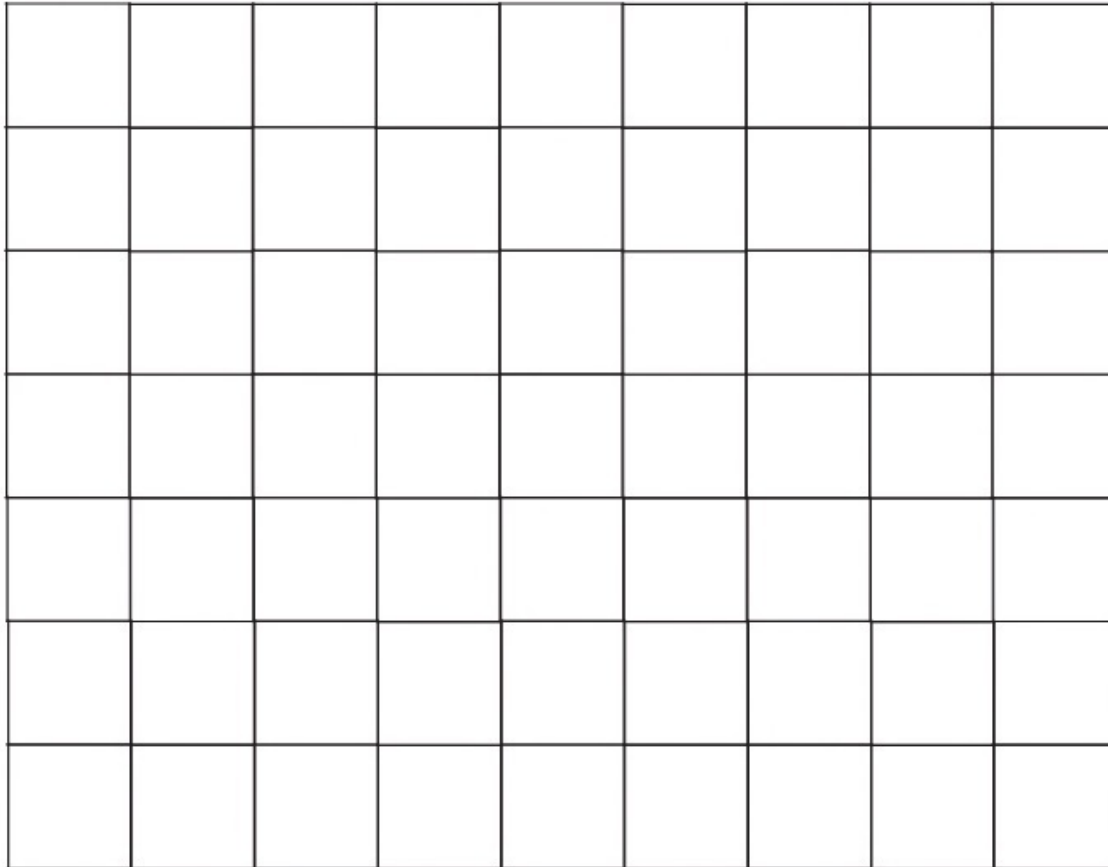
Enlargement

Enlarging a shape changes its size.

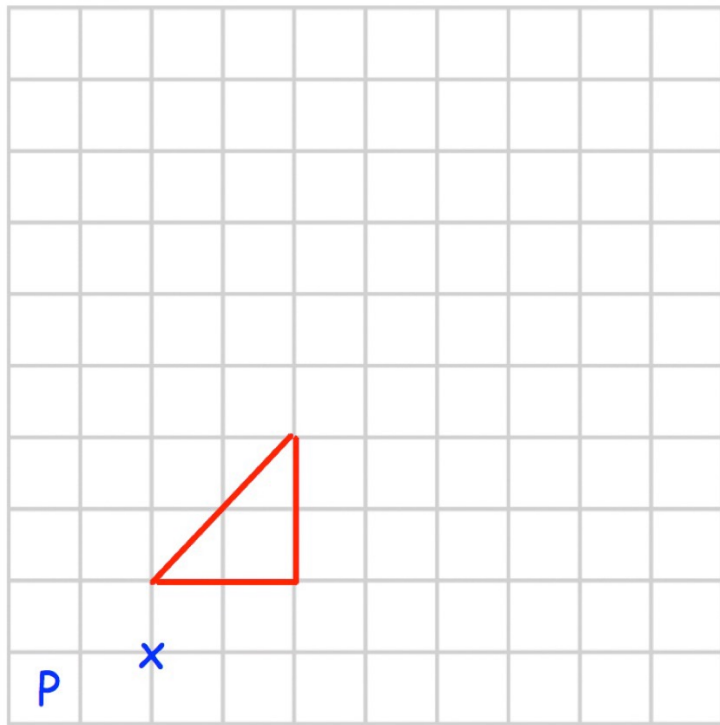
To enlarge a shape we need

1. Scale factor
2. Centre of enlargement

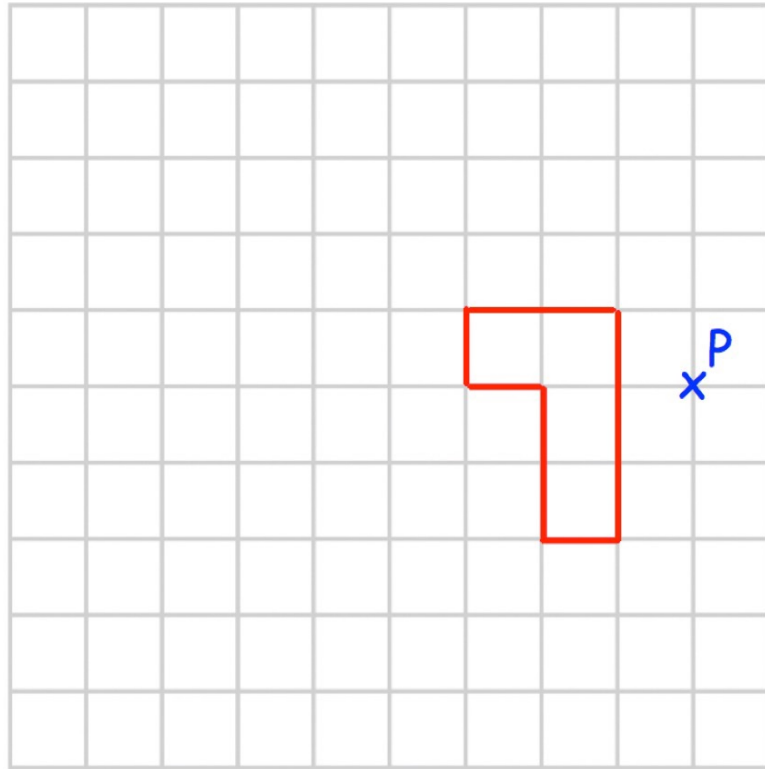




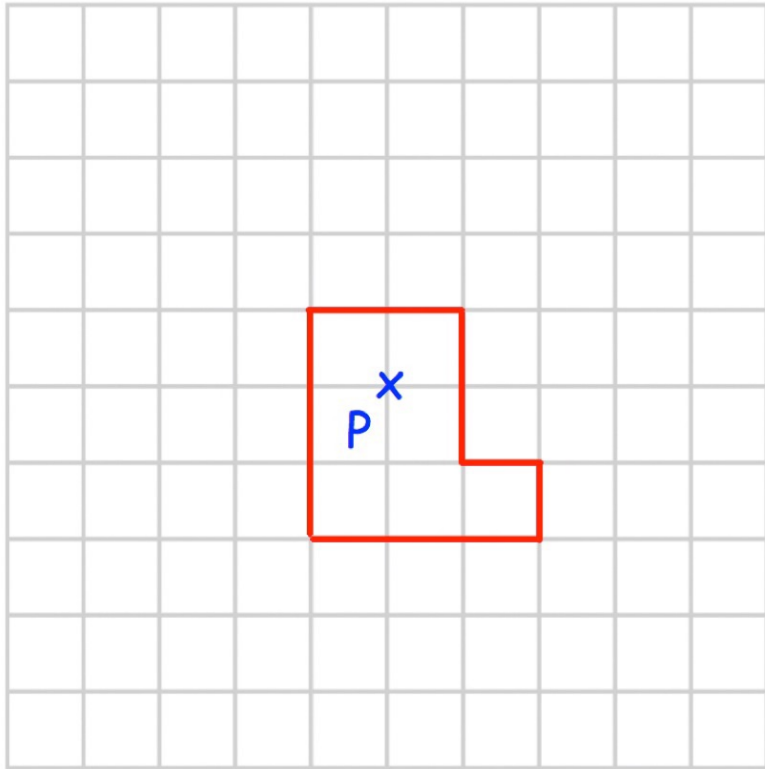
How to draw enlargement when scale factor and centre given



Enlarge by scale factor 3

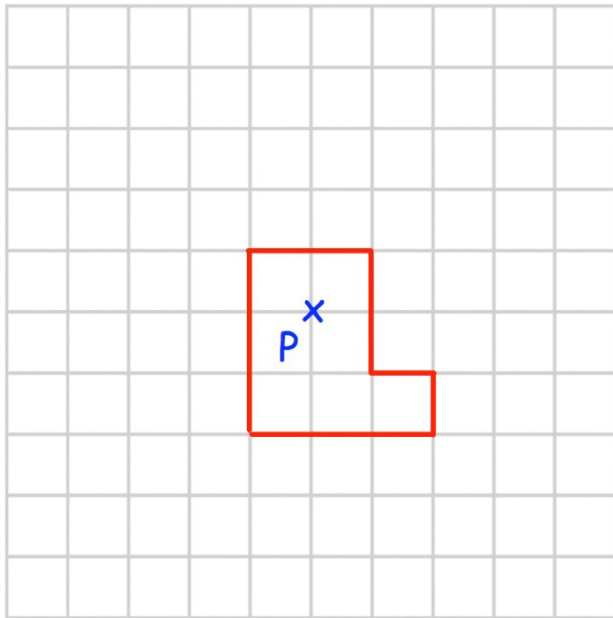


Enlarge by scale factor 2



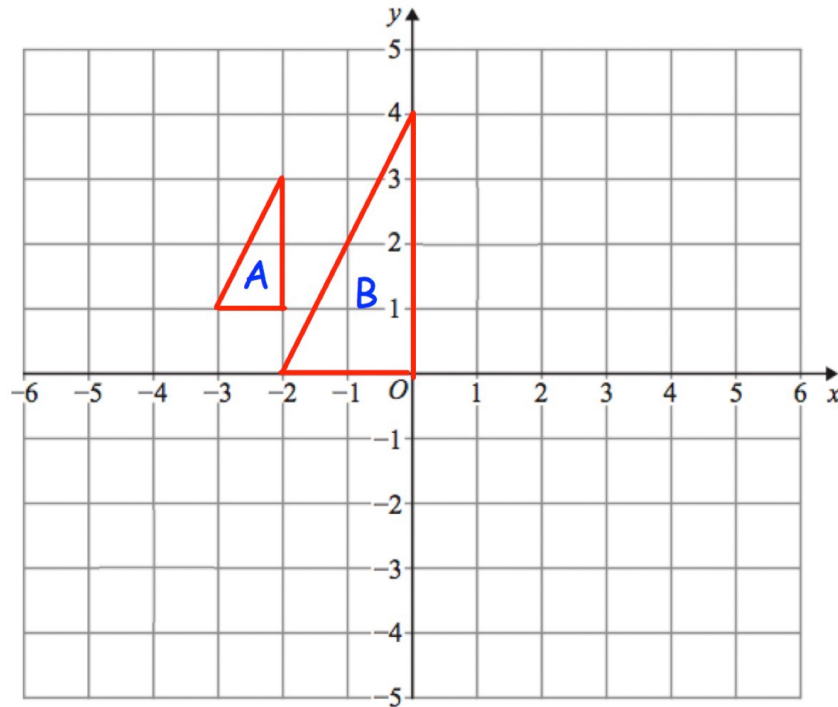
Enlarge by scale factor 2

Tip



Enlarge by scale factor 2

Describe fully the single transformation that takes shape A to shape B.

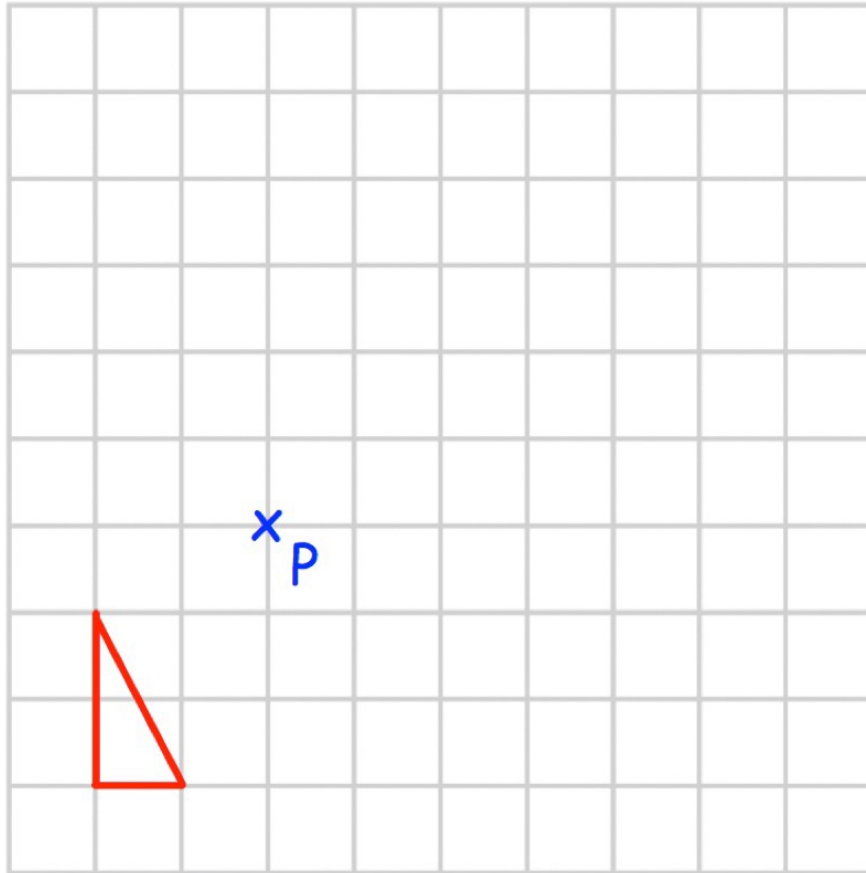


You need to find
CENTRE of enlargement

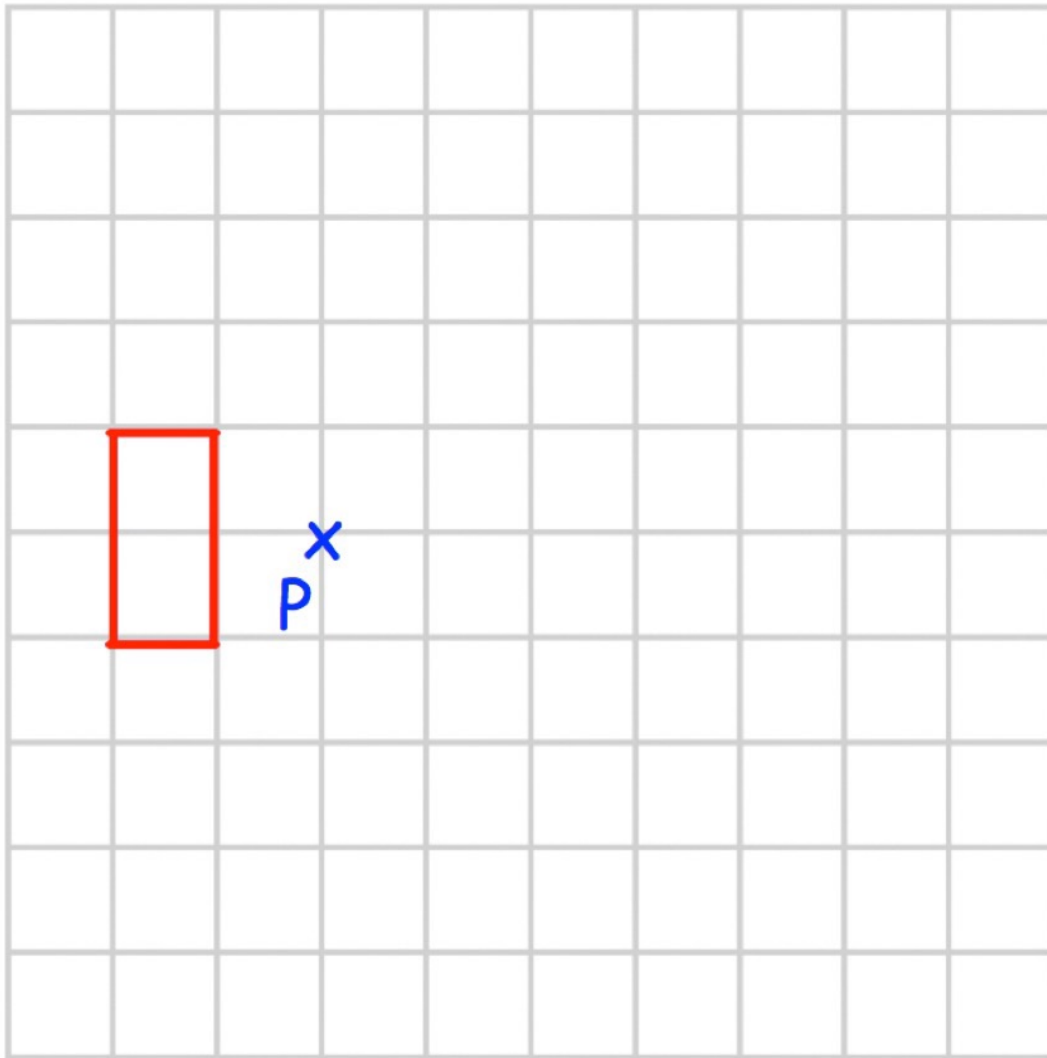
Enlargement with **NEGATIVE** scale factor



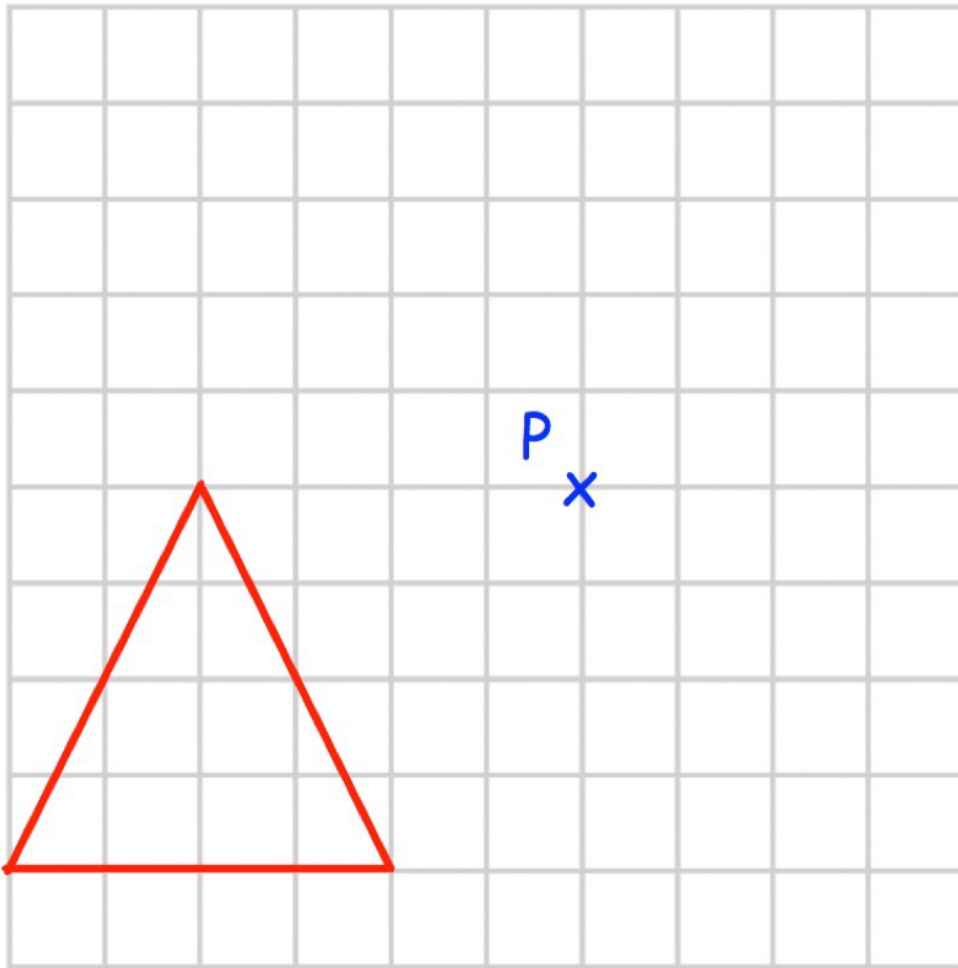
When you enlarge any shape with negative scale factor , shape with flip into opposite side of centre of enlargement



Enlarge by scale factor -2

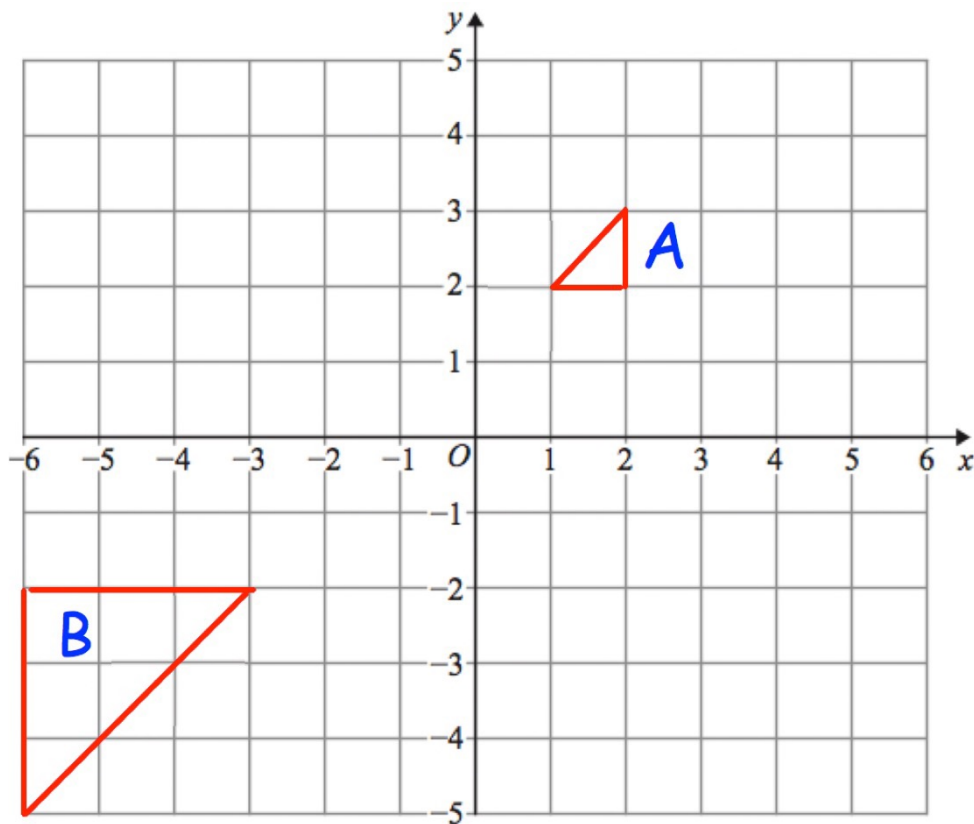


Enlarge by scale factor -3



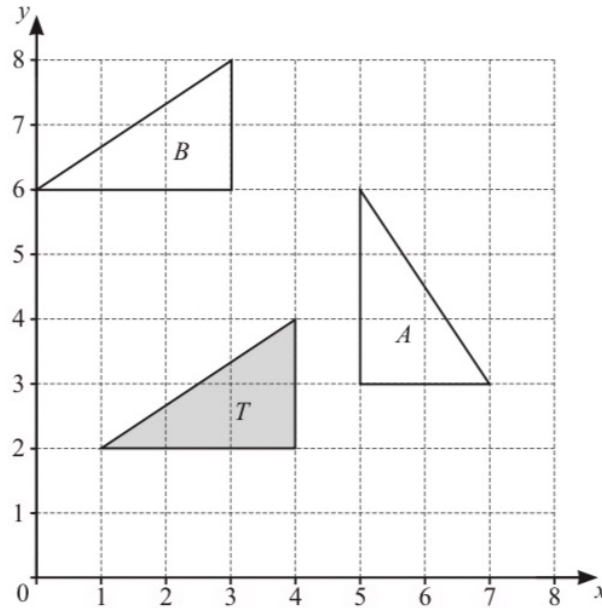
Enlarge by scale factor $-\frac{1}{2}$

Describe fully the single transformation that takes shape A to shape B.



Question 1

The diagram shows three triangles, T , A , and B



(a) Describe fully the **single** transformation that maps triangle A onto triangle T

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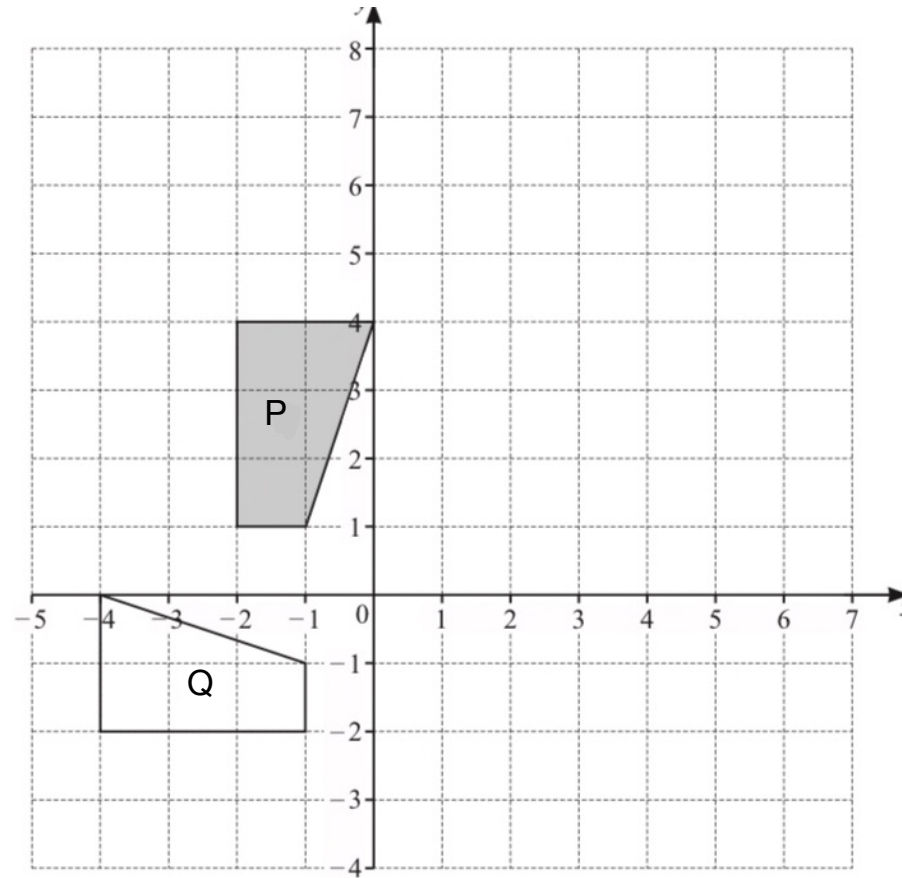
.....

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

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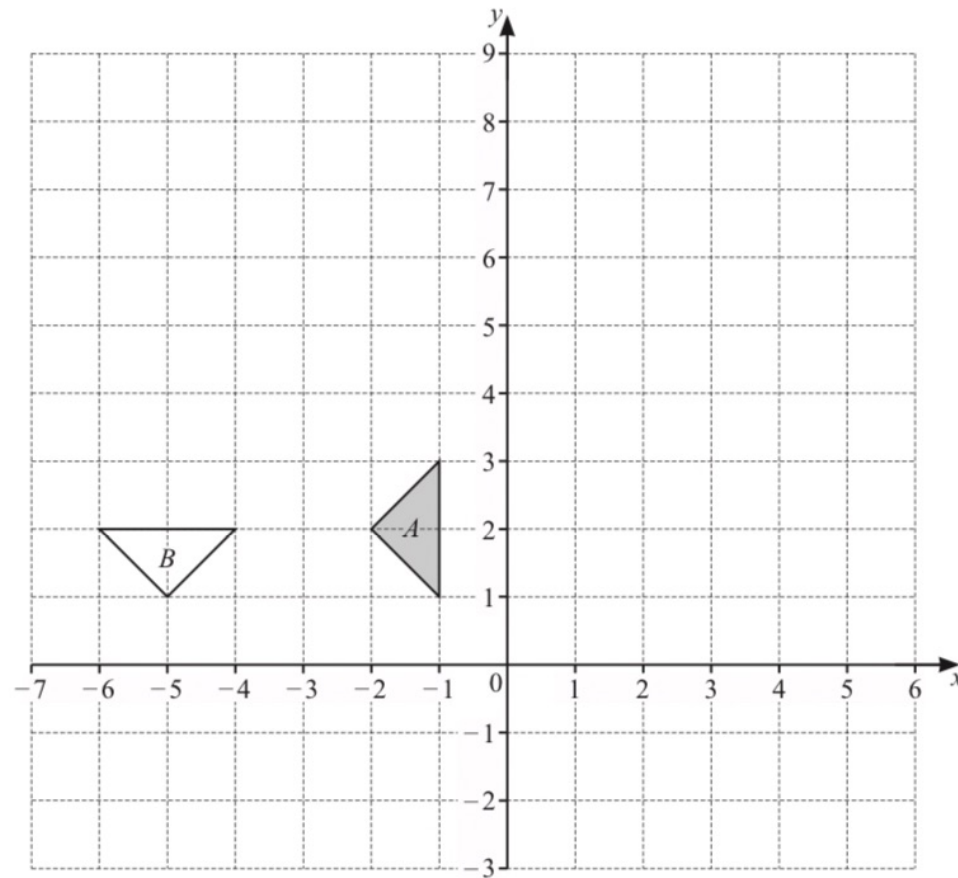
.....

Question 2



- (i) On the grid, draw the image of
 - (a) shape P after an enlargement, scale factor 2, centre $(0, 1)$,
 - (b) shape P after a reflection in the line $y = x$
- (ii) Describe fully the **single** transformation that maps shape P onto shape Q .

Question 3



- (a) On the grid, draw the image of triangle *A* after
- a translation by the vector $\begin{pmatrix} -3 \\ 6 \end{pmatrix}$,
 - a reflection in the line $x = 2$
 - an enlargement, scale factor 2 and centre $(-5, -2)$.
- (b) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.