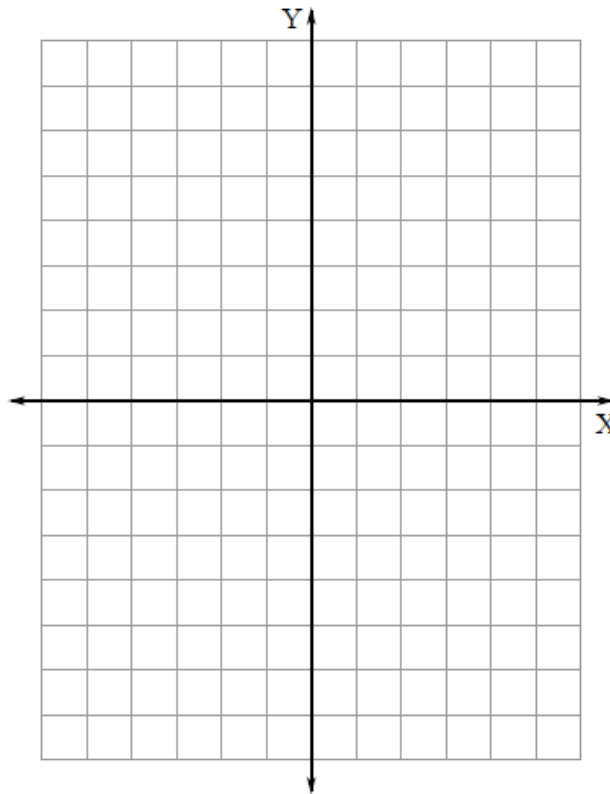


Graph triangle ABC with vertices $A(-4, 1)$, $B(-2, 1)$, and $C(-1, -2)$ on a coordinate grid.

1. Graph the image of triangle ABC after a 180° clockwise rotation about the origin.
2. Which side of the image is congruent to side \overline{AB} ?
3. Which angle in the image is congruent to angle B ?
4. If a point M , located at $(3, -2)$, is rotated clockwise 90° about the origin, what are the coordinates of its image, M' ?
5. Angle G in trapezoid $FGHJ$ measures 135° . If Lee rotates the trapezoid 270° counterclockwise about the origin, what will be the measure of angle G' in the image?



9.5 Congruent Figures

Common Core Standard:

8.G.2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them

Vocabulary

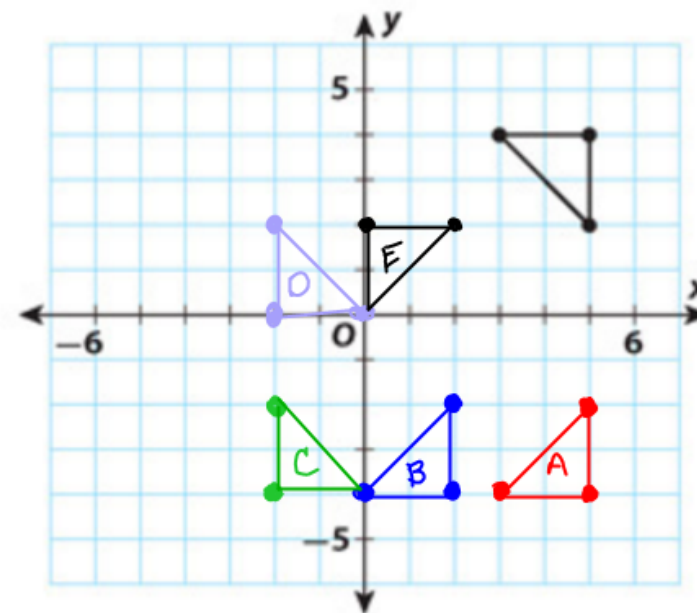
Congruent - figures have same size
and shape

→ obtained by translations,
reflections, & rotations

Combining Transformations

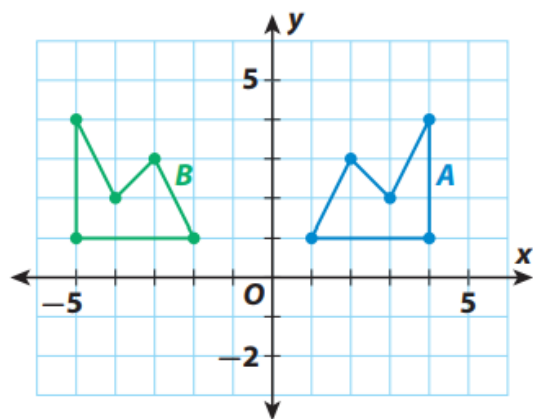
Apply the indicated series of transformations to the triangle. Each transformation is applied to the image of the previous transformation, not the original figure. Label each image with the letter of the transformation applied.

- A** Reflection across the x -axis ●
- B** $(x, y) \rightarrow (x - 3, y)$ ●
- C** Reflection across the y -axis ●
- D** $(x, y) \rightarrow (x, y + 4)$ ●
- E** Rotation 90° clockwise around the origin ●
- F** Compare the size and shape of the final image to that of the original figure.



EXAMPLE 1

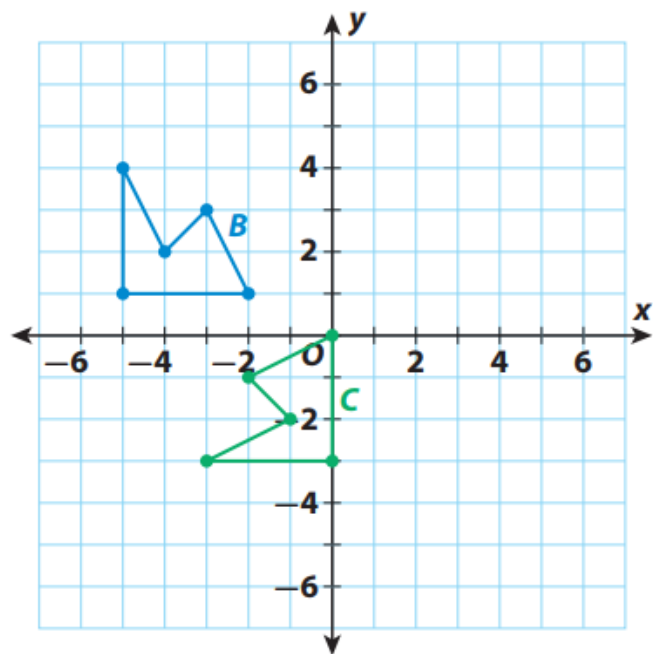
- A** Identify a sequence of transformations that will transform figure *A* into figure *B*.



- Reflect over *y*-axis
- Translate 1 unit left

EXAMPLE 1

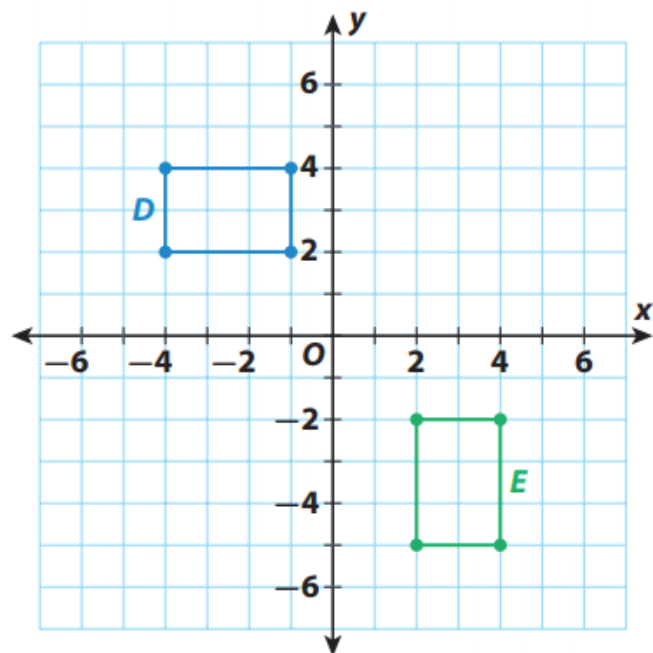
- B** Identify a sequence of transformations that will transform figure *B* into figure *C*.



- 90° counterclockwise rotation about the origin
- Translate up 2 and right 1

EXAMPLE 1

- C** Identify a sequence of transformations that will transform figure *D* into figure *E*.



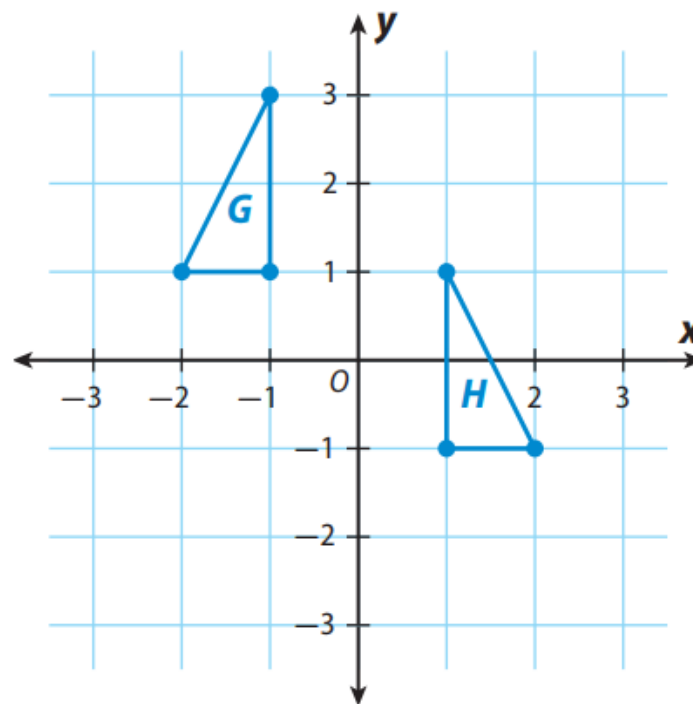
- 90° clockwise rotation
about the origin

- Translate 6 units
down

ADDITIONAL EXAMPLE 1

A Identify a sequence of transformations that will transform figure G into figure H .

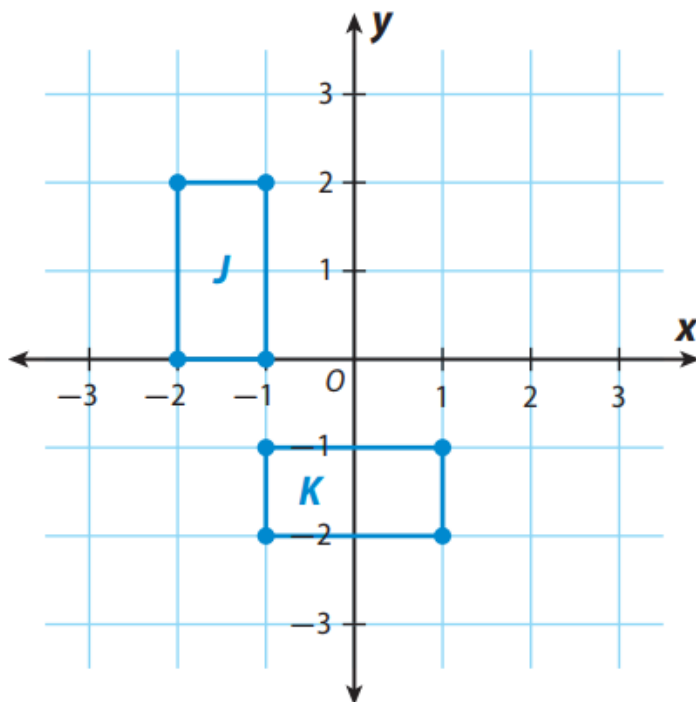
- Reflect across y -axis
- Translate 2 units down



ADDITIONAL EXAMPLE 1

B Identify a sequence of transformations that will transform figure *J* into figure *K*.

- Rotate 90° clockwise
- Translate 3 units down and 1 unit left



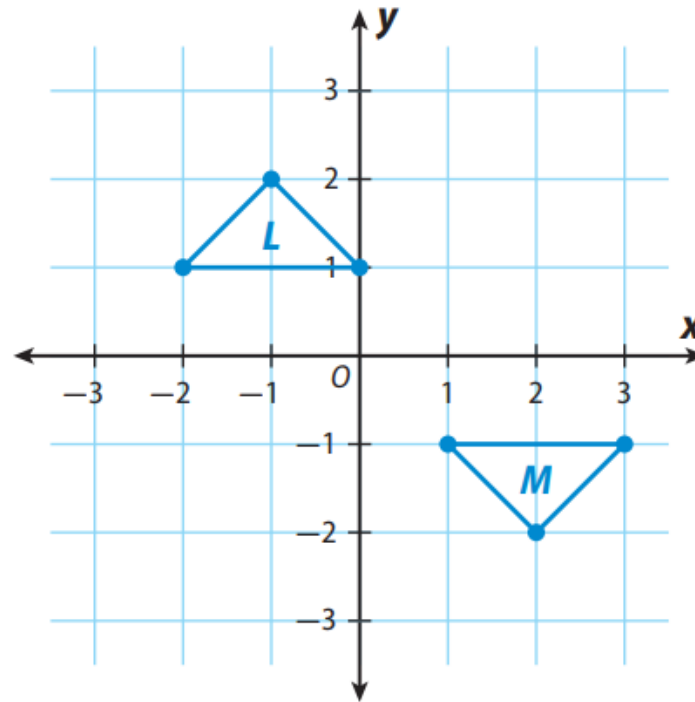
C Identify a sequence of transformations that will transform figure L into figure M .

Option 1:

- 180° Rotation
- Translate 1 unit right

Option 2:

- Reflect across x -axis
- Translate 3 units right



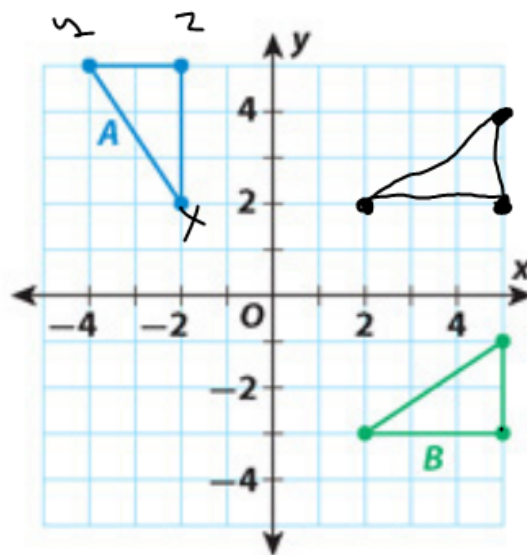
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YOUR TURN

3. Identify a sequence of transformations that will transform figure A into figure B.

A

Rotate 90°
clockwise, then
translate 5
units down



$(X(-1), Y)$, switch

$X(-2, 2)$

$X'(-2(-1), 2) \rightarrow (2, 2)$

$Y(-4, 5)$

$Y'(-4(-1), 5) \rightarrow (5, 5)$

$Z(-2, 5)$

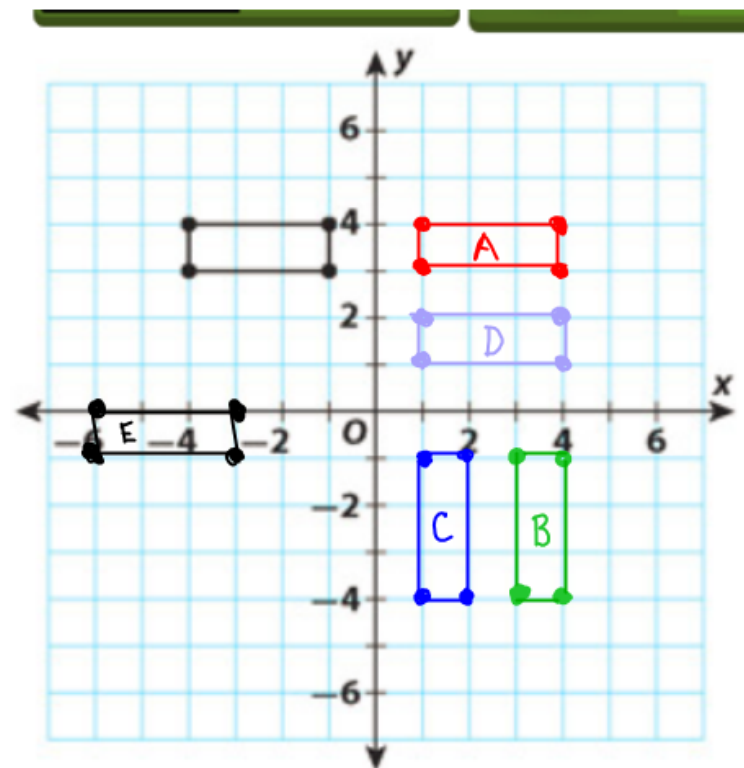
$Z'(-2(-1), 5) \rightarrow (5, 5)$

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1. Apply the indicated series of transformations to the rectangle. Each transformation is applied to the image of the previous transformation, not the original figure. Label each image with the letter of the transformation applied.

(Explore Activity)

- Reflection across the y -axis
- Rotation 90° clockwise around the origin
- $(x, y) \rightarrow (x - 2, y)$
- Rotation 90° counterclockwise around the origin
- $(x, y) \rightarrow (x - 7, y - 2)$



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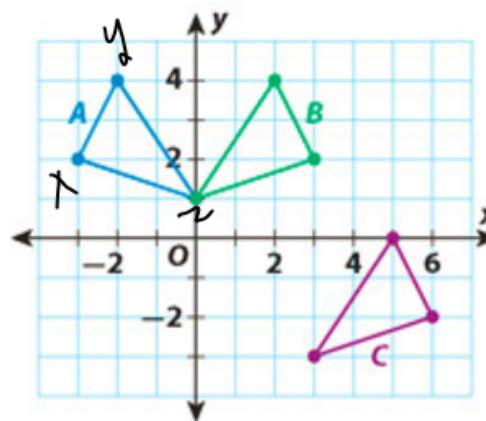
Identify a sequence of transformations that will transform figure A into figure C. (Example 1)

2. What transformation is used to transform figure A into figure B?

Reflect across the
y axis

3. What transformation is used to transform figure B into figure C?

translate 4 units
down and 3 units right



4. What sequence of transformations is used to transform figure A into figure C? Express the transformations algebraically.

Reflect across the y-axis then
translate 4 units down and 3 units right

