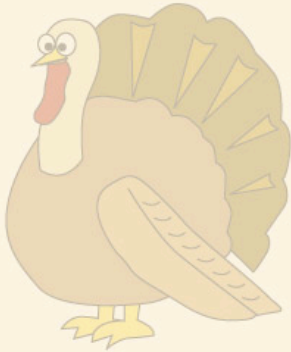


Algebra I

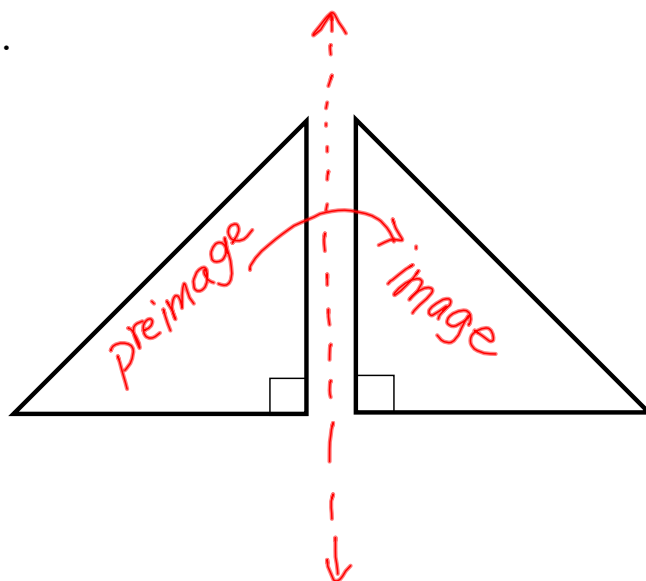
Lesson 4-2

- I can transform figures by using reflections, translations, dilations, and rotations.
- I can transform figures on a coordinate plane by using reflections, translations, dilations, and rotations.

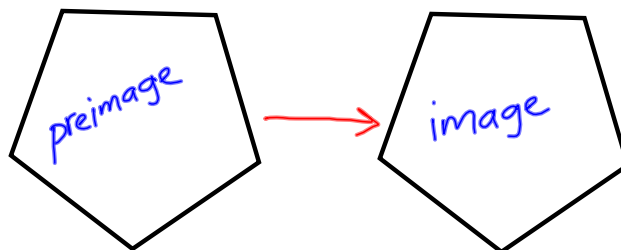


Transformations are movements of geometric figures. The preimage is the position of the figure before the transformation, and the image is the position of the figure after the transformation.

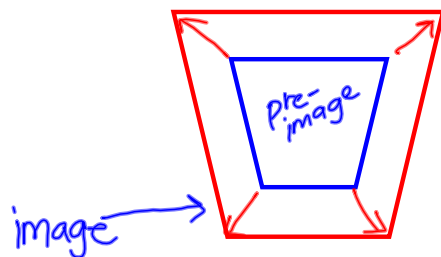
A reflection is when a figure is flipped
over a line.



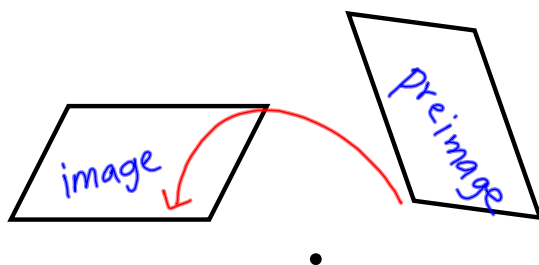
A translation is when a figure is slid
in any direction.



A dilation is when a figure is enlarged
or reduced.

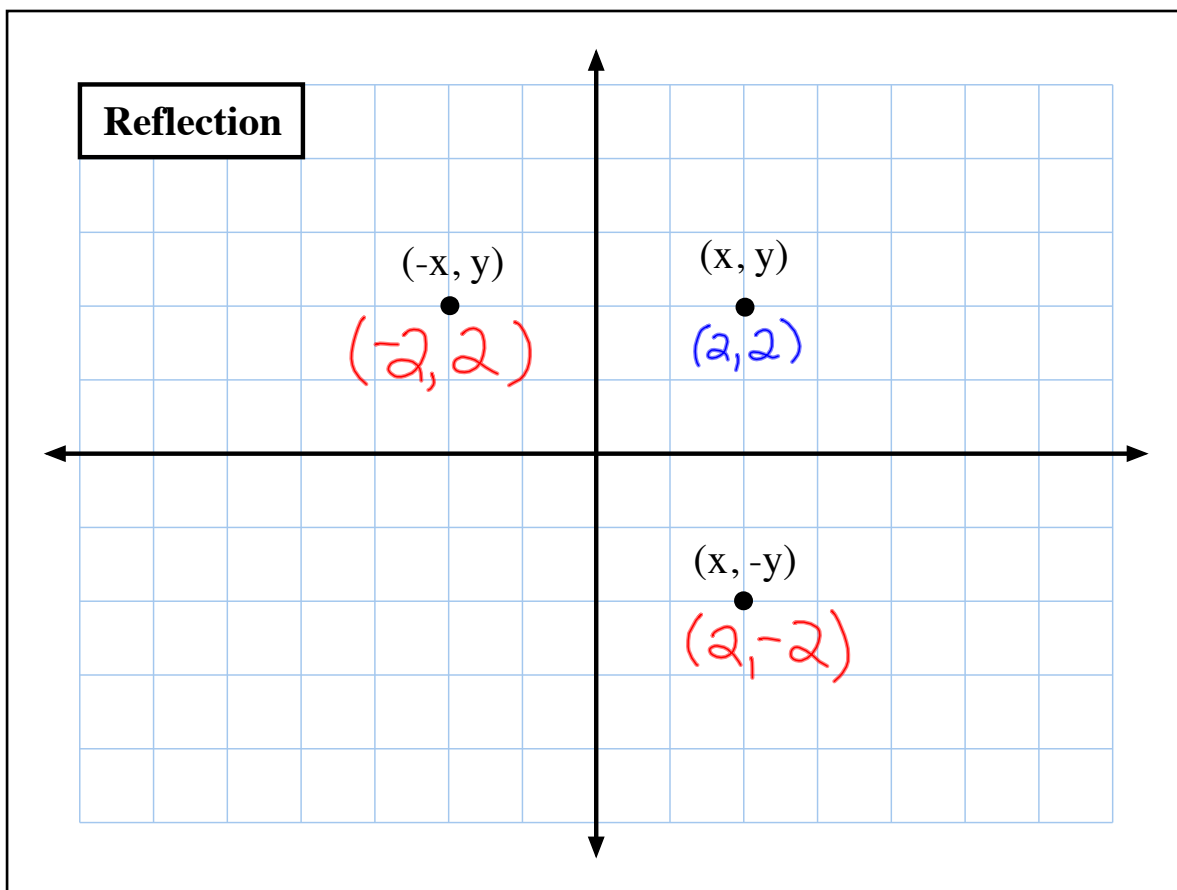


A rotation is when a figure is turned
around a point.



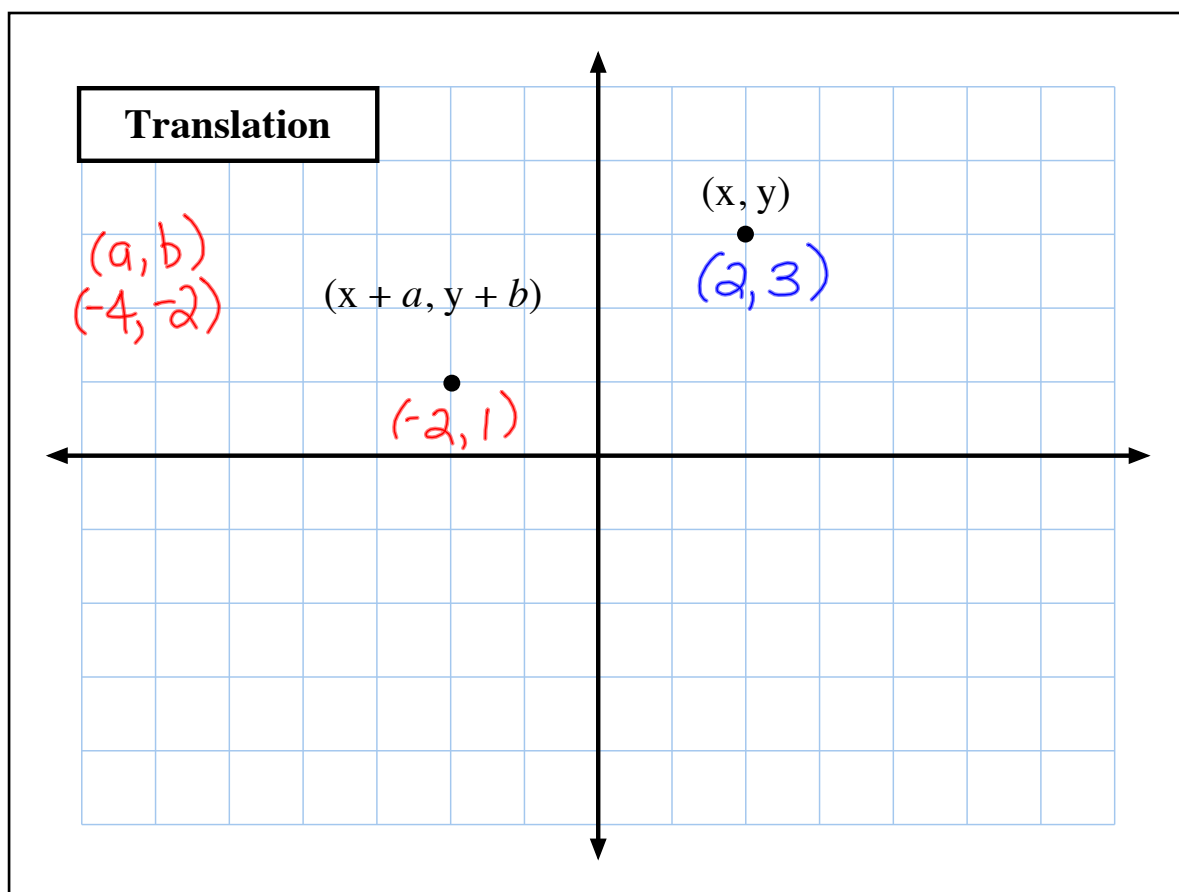
TRANSFORMATIONS ON THE COORDINATE PLANE

	WORDS	SYMBOLS
Reflection	To reflect a point over the x-axis, multiply the y-coordinate by -1. To reflect a point over the y-axis, multiply the x-coordinate by -1.	reflection over x-axis: $(x, y) \rightarrow (x, -y)$ reflection over y-axis: $(x, y) \rightarrow (-x, y)$



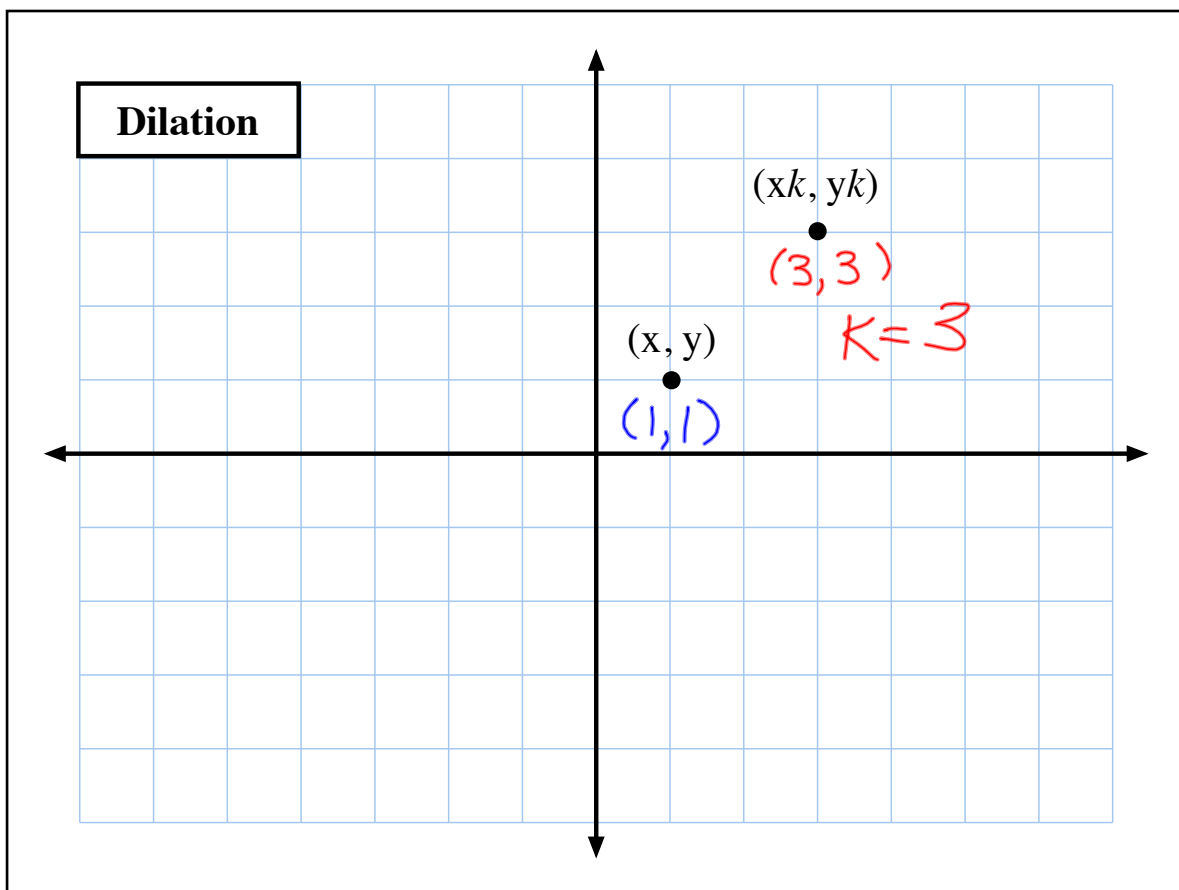
TRANSFORMATIONS ON THE COORDINATE PLANE

	WORDS	SYMBOLS
Translation	To translate a point by an ordered pair (a, b) , add a to the x-coordinate and b to the y-coordinate.	$(x, y) \rightarrow (x + a, y + b)$



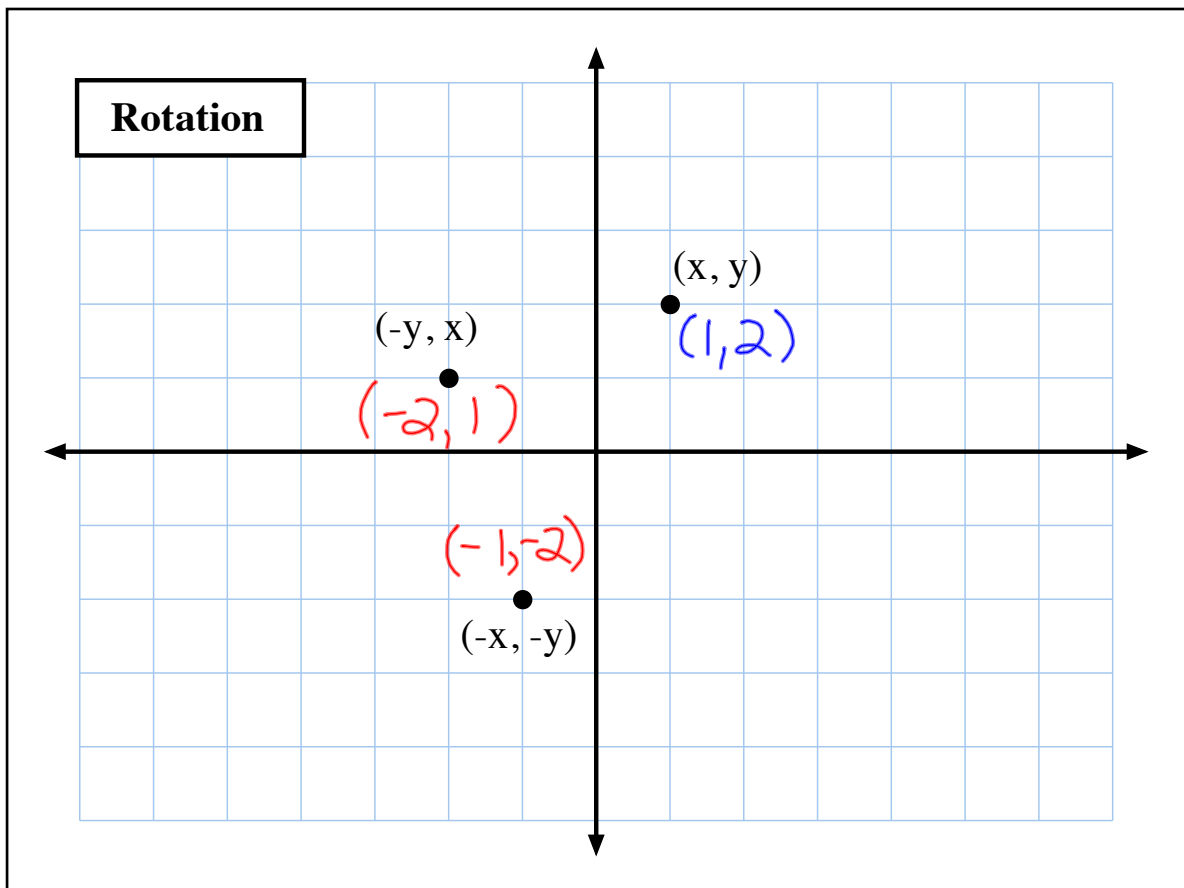
TRANSFORMATIONS ON THE COORDINATE PLANE

	WORDS	SYMBOLS
Dilation	<p>To dilate a figure by a scale factor k, multiply both coordinates by k.</p> <p>If $k > 1$, the figure is enlarged.</p> <p>If $0 < k < 1$, the figure is reduced.</p>	$(x, y) \rightarrow (xk, yk)$



TRANSFORMATIONS ON THE COORDINATE PLANE

	WORDS	SYMBOLS
Rotation	To rotate a figure 90° counterclockwise about the origin, switch the coordinates of each point and then multiply the new first coordinate by -1 . To rotate a figure 180° about the origin, multiply both coordinates of each point by -1 .	90° rotation: $(x, y) \rightarrow (-y, x)$ 180° rotation: $(x, y) \rightarrow (-x, -y)$



A parallelogram has vertices $A(-4, 3)$, $B(1, 3)$, $C(0, 1)$, and $D(-5, 1)$.

Parallelogram $ABCD$ is reflected over the x -axis. Find the coordinates of the vertices of the image.

$$(x, y) \rightarrow (x, -y)$$

$$A'(-4, -3)$$

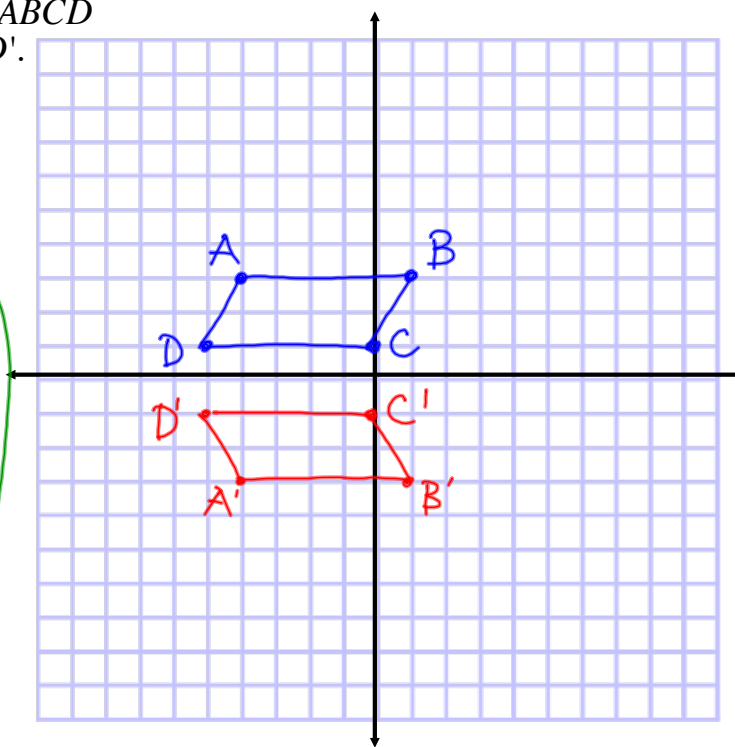
$$B'(1, -3)$$

$$C'(0, -1)$$

$$D'(-5, -1)$$

Graph parallelogram $ABCD$ and its image $A'B'C'D'$.

Do:
Translation,
Dilation,
Rotation
in packet

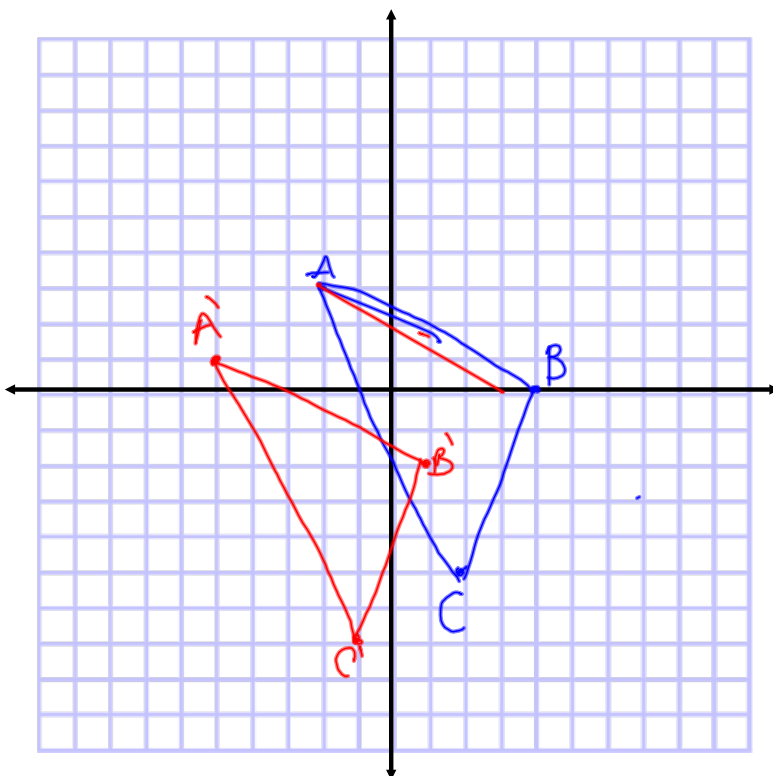


Triangle ABC has vertices $A(-2, 3)$, $B(4, 0)$, and $C(2, -5)$.

Find the coordinates of the vertices of the image if it is translated 3 units to the left and 2 units down.

$$(x, y) \rightarrow (x+a, y+b)$$
$$(x-3, y-2)$$
$$A'(-5, 1)$$
$$B'(1, -2)$$
$$C'(-1, -7)$$

Graph triangle ABC and its image.



A trapezoid has vertices $L(-4, 1)$, $M(1, 4)$, $N(7, 0)$, and $P(-3, -6)$.

Find the coordinates of the dilated trapezoid $L'M'N'P'$ if the scale factor is $\frac{3}{4}$.

$$(X, Y) \rightarrow \left(\frac{3}{4}X, \frac{3}{4}Y\right)$$

$K = \frac{3}{4}$

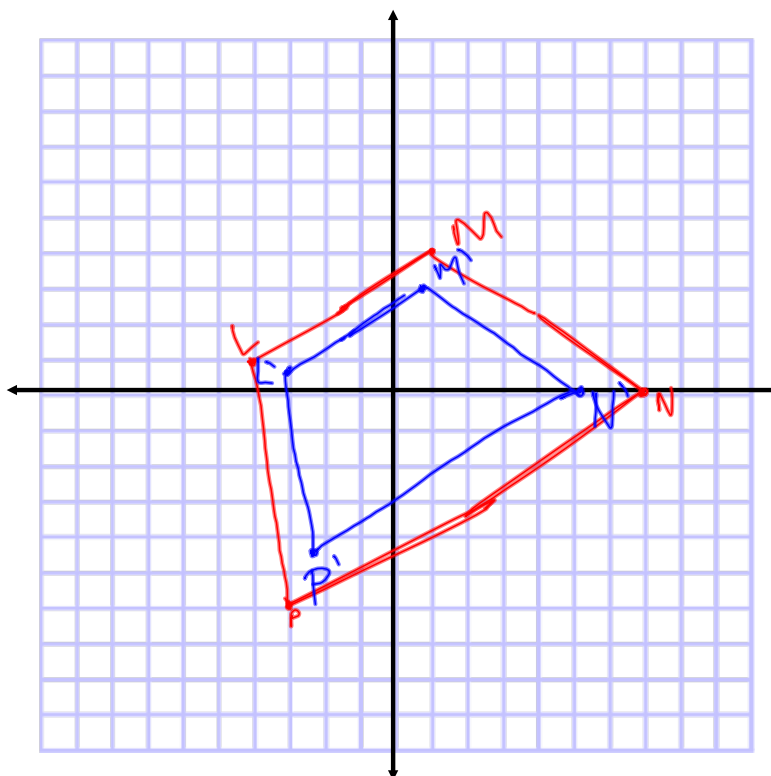
$$L'(-3, \frac{3}{4})$$

$$M'(\frac{3}{4}, 3)$$

$$N'(5\frac{1}{4}, 0)$$

$$P'(-2\frac{1}{4}, -4\frac{1}{2})$$

Graph the preimage and image of the trapezoid.



Triangle XYZ has vertices $X(1, 5)$, $Y(5, 2)$, and $Z(-1, 2)$.

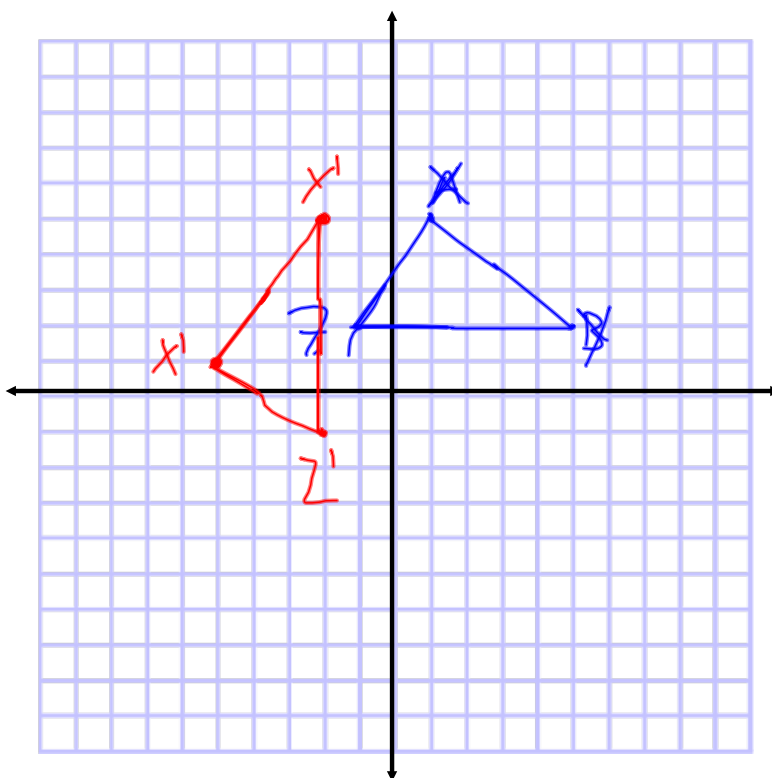
Find the coordinates of the image of $\triangle XYZ$ after it is rotated 90° counterclockwise about the origin.

$$(x, y) \rightarrow (-y, x)$$

$$X'(-5, 1)$$

$$Y'(-2, 5)$$

$$Z'(-2, -1)$$



Assignment:

Pgs. 201-203 #12-26 even, 27-29 all

*Note: Due to the number of problems in this assignment, full credit will only be given for missing 1 or less problems.

