Transformations on the Coordinate Plane: Reflections

A **reflection** is a type of transformation that flips a figure over a line, called the *line of reflection*. A reflection creates a mirror image that is congruent to the original figure. Here are some rules to help you find the points of a reflected figure:

Reflection across the x-axis	• x-coordinate stays the same • y-coordinate is the **opposite**	$(x, y) \mapsto (x, \mathbf{-y})$
Reflection across the y-axis	• x-coordinate is the **opposite** • y-coordinate stays the same	$(x, y) \mapsto (\mathbf{-x}, y)$
Reflection across any line	Each point in the image is the same distance from the line of reflection as its corresponding point in the preimage.	

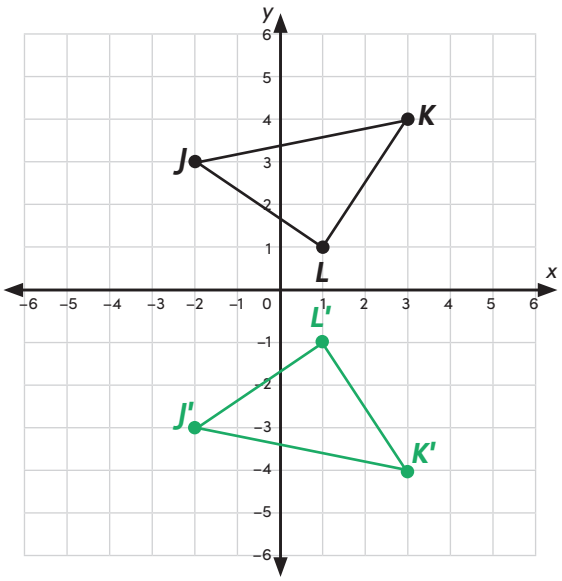
Reflecting a Figure: Reflect $\triangle JKL$ across the x-axis. What are the coordinates of the image?

$J(-2, 3) \mapsto J'(-2, \mathbf{-3})$

$K(3, 4) \mapsto K'(3, \mathbf{-4})$

$L(1, 1) \mapsto L'(1, \mathbf{-1})$

The coordinates of the image are $J'(-2, -3)$, $K'(3, -4)$, and $L'(1, -1)$.



Describing a Reflection: Parallelogram $QRST$ and its image after a reflection are given. Identify the line of reflection.

$Q(-4, 5) \mapsto Q'(\mathbf{4}, 5)$

$R(-2, 5) \mapsto R'(\mathbf{2}, 5)$

$S(-3, 1) \mapsto S'(\mathbf{3}, 1)$

$T(-5, 1) \mapsto T'(\mathbf{5}, 1)$

For each vertex, the x-coordinate is the **opposite** and the y-coordinate is the same.

The line of reflection is the y-axis.