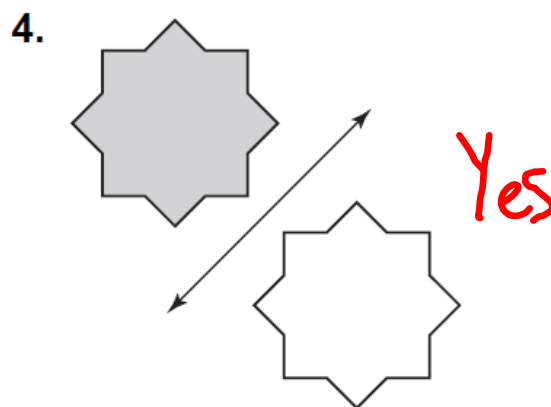
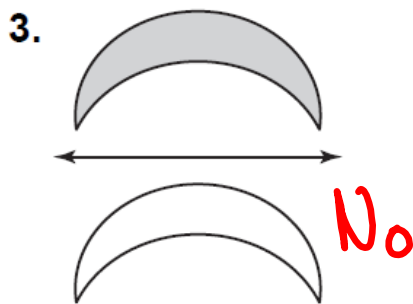
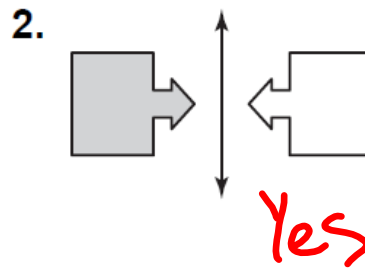
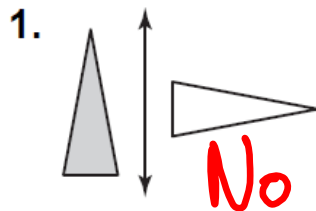


Lesson 2.3: Reflections

Essential Question

How can you use reflections to classify a frieze pattern?

Tell whether the shaded figure is a reflection of the nonshaded figure.



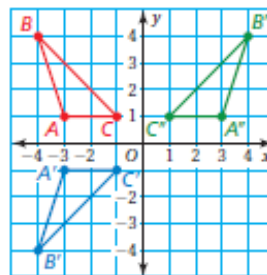
Key Idea

Reflections in the Coordinate Plane

Words To reflect a figure in the x -axis, take the opposite of the y -coordinate.

To reflect a figure in the y -axis, take the opposite of the x -coordinate.

Algebra Reflection in x -axis: $(x, y) \rightarrow (x, -y)$
Reflection in y -axis: $(x, y) \rightarrow (-x, y)$



In a reflection, the original figure and its image are congruent.

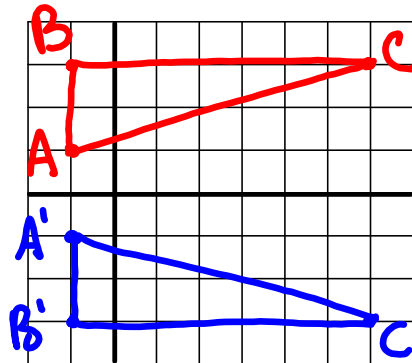
The vertices of a triangle are $A(-1, 1)$, $B(-1, 3)$, and $C(6, 3)$. Draw the figure and its reflection in the x-axis. What are the coordinates of the image?

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

$$A(-1, 1) \rightarrow A'(-1, -1)$$

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

$$C(6, 3) \rightarrow C'(6, -3)$$



The vertices of a quadrilateral are $P(-2, 5)$, $Q(-1, -1)$, $R(-4, 2)$, and $S(-4, 4)$. Draw the figure and its reflection in the y-axis.

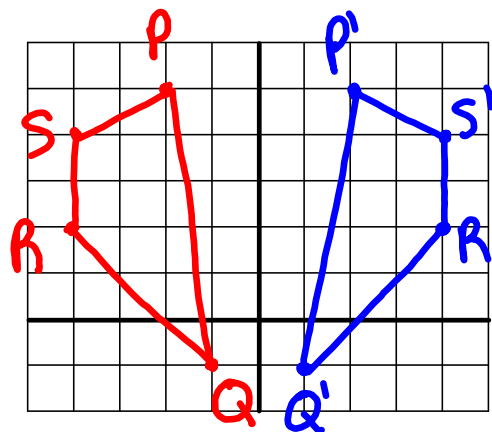
$$(x, y) \rightarrow (-x, y)$$

$$P(-2, 5) \rightarrow P'(2, 5)$$

$$Q(-1, -1) \rightarrow Q'(1, -1)$$

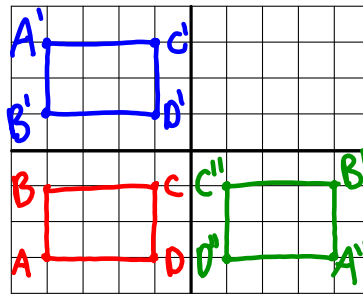
$$R(-4, 2) \rightarrow R'(4, 2)$$

$$S(-4, 4) \rightarrow S'(4, 4)$$



4. The vertices of a rectangle are $A(-4, -3)$, $B(-4, -1)$, $C(-1, -1)$, and $D(-1, -3)$.

a. Draw the figure and its reflection in the x -axis.



b. Draw the figure and its reflection in the y -axis.

Use labels $A''B''C''D''$ to distinguish from $A'B'C'D'$.

c. Are the images in parts (a) and (b) congruent? Explain.

Yes! They are both congruent to $ABCD$, so they are congruent to each other, as well.