

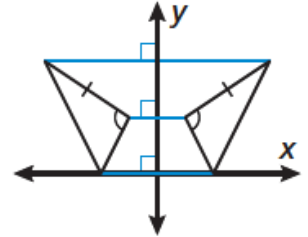
Geometry Lesson 74

Objective: TSW understand and use reflections.

A reflection is a transformation that reflects every point in a figure over a given line. After reflection, the image of the figure is congruent to the preimage, but has a different orientation.

Property of Reflection - A reflection is an isometry, meaning the preimage and its reflected image have the same shape and size.

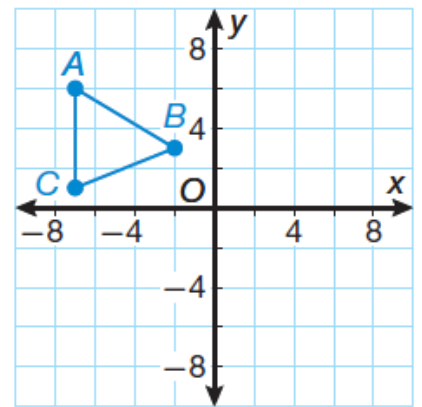
To reflect a point across a horizontal or vertical line, imagine that the line is a mirror, and visualize the reflected location of the point. The figure shows a triangle reflected over the y -axis.



Example 1 Reflecting Across an Axis

Reflect $\triangle ABC$ across the y -axis. Find the coordinates of the vertices of the reflected image and write the transformation in mapping notation.

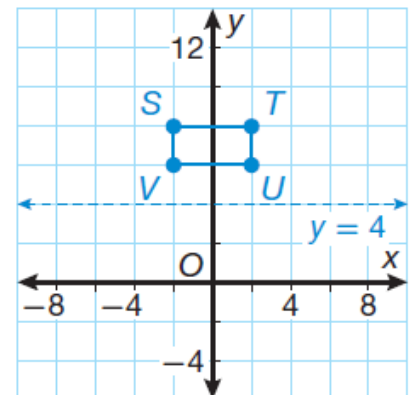
SOLUTION



Example 2 Reflecting Across a Horizontal Line

Reflect the rectangle $STUV$ across the line $y = 4$. Identify the coordinates of the vertices of the reflected image.

SOLUTION



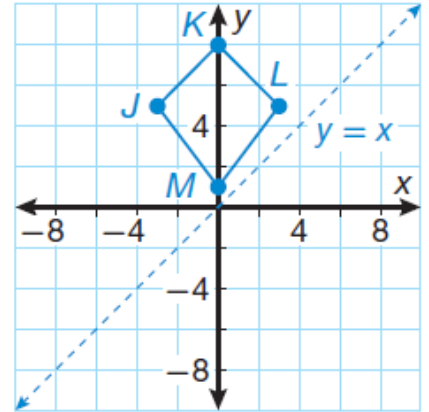
Notice that when a point is reflected across a horizontal line, its x -coordinate does not change. When a point is reflected across a vertical line, its y -coordinate does not change.

To find the reflection of a point across any line in the coordinate plane, draw a perpendicular line from the point to the line of reflection. The point's reflection will be equidistant from the line of reflection on both sides.

Example 3 Reflecting Across a Line

Reflect quadrilateral $JKLM$ across the line $y = x$. Identify the coordinates of the vertices of the reflected image.

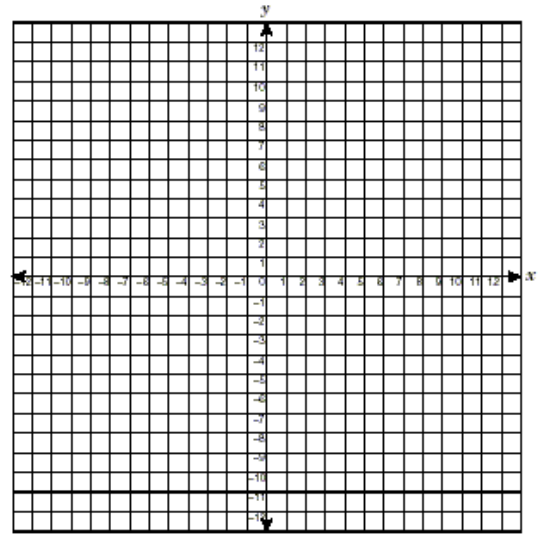
SOLUTION



Example 4 Application: Visual Arts

Marina is creating a work of art using part of a photograph and its reflection. In a coordinate grid, the corners of the photograph fragment are located at $(-3, 2)$, $(2, 8)$, and $(10, 2)$. Reflect the fragment across the line $y = 2$.

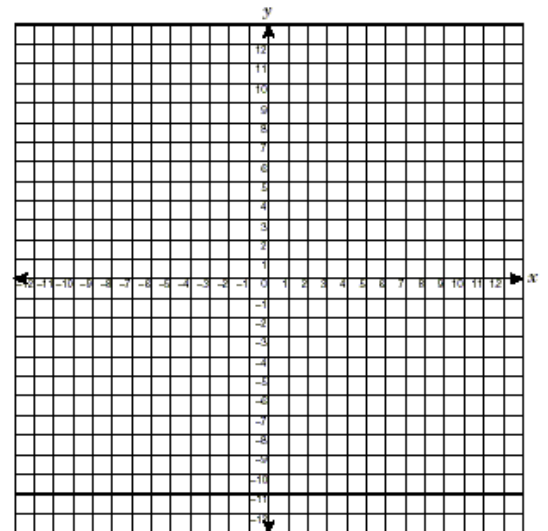
SOLUTION



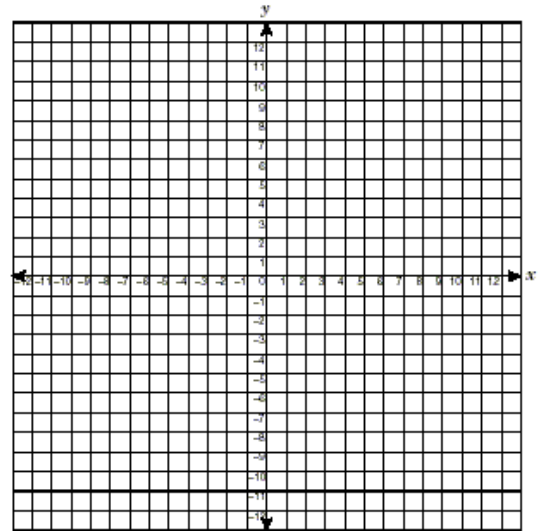
You Try!!!!

Rectangle $ABCD$ has vertices at $A(1, 1)$, $B(5.5, 1)$, $C(5.5, 3.5)$, and $D(1, 3.5)$. Reflect $ABCD$ as described in parts a through c.

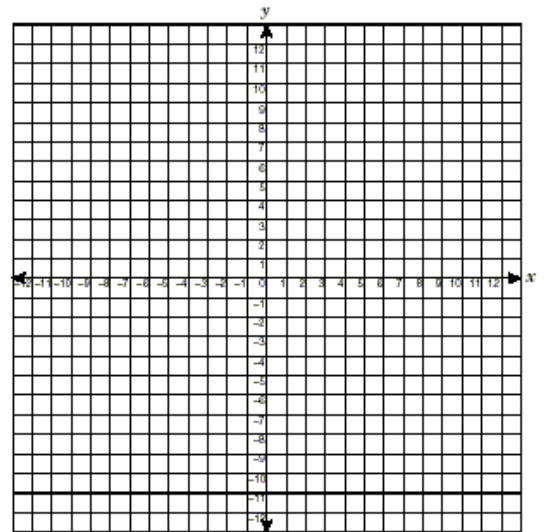
a. Reflect $ABCD$ across the y -axis.



b. Reflect $ABCD$ across the line $y = 2$.



c. Reflect $ABCD$ across the line $y = x$.



d. Visual Arts This figure shows half of an optical illusion. Complete the figure by reflecting it across the line $x = 4$.

