

Reflections

Warm Up

1. The translation image of $P(-3, -1)$ is $P'(1, 3)$. Find the translation image of $Q(2, -4)$.

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Reflections

Objective

Identify and draw reflections.

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Reflections

Isometry: a transformation which does not change the shape or size of a figure

*Reflections, translations, and rotations are all isometries.

*Isometries are also called *congruence transformations* or *rigid motions*.

Recall a reflection is a transformation which moves a figure (the preimage) by reflecting it across a line. The reflected figure is called the image. A reflection is an isometry, so the image is always congruent to the preimage.

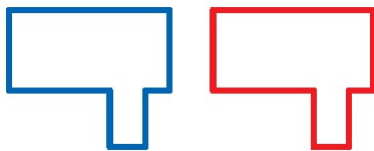
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Reflections

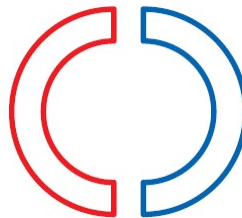
Example 1: Identifying Reflections

Tell whether each transformation appears to be a reflection. Explain.

A.



B.



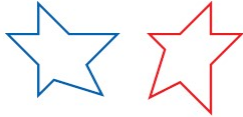
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Reflections


Check It Out! Example 1

Tell whether each transformation appears to be a reflection.

a.



b.



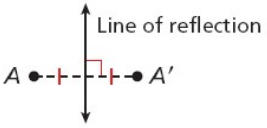
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Reflections

Reflections

A reflection is a transformation across a line, called the line of reflection, so that the line of reflection is the perpendicular bisector of each segment joining each point and its image.



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Reflections

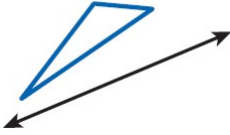
Example 2: Drawing Reflections

Draw the reflection of the triangle across the line.

Step 1 Through each vertex, draw a line perpendicular to the line of reflection.

Step 2 Measure the distance from each vertex to the line of reflection. Measure the same distance on the opposite side of the line of reflection to locate the image of each vertex.

Step 3 Connect the images of the vertices.



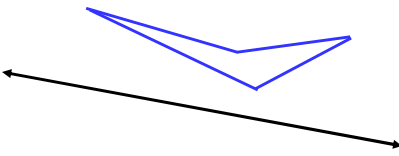
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Check It Out! Example 2

Draw the reflection of the quadrilateral across the line.

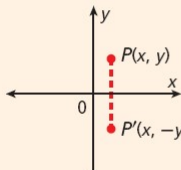
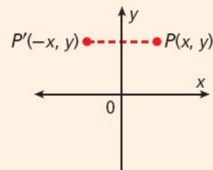
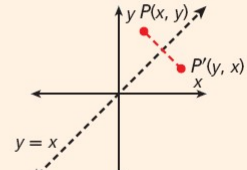


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Reflections

Reflections in the Coordinate Plane

ACROSS THE x -AXIS	ACROSS THE y -AXIS	ACROSS THE LINE $y = x$
 <p>$(x, y) \rightarrow (x, -y)$</p>	 <p>$(x, y) \rightarrow (-x, y)$</p>	 <p>$(x, y) \rightarrow (y, x)$</p>

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Example 4A: Drawing Reflections in the Coordinate Plane

Reflect the figure with the given vertices across the given line.

$X(2, -1)$, $Y(-4, -3)$, $Z(3, 2)$; x -axis

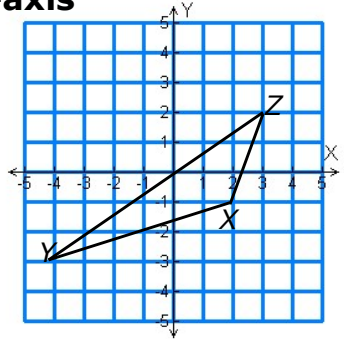
The reflection of (x, y) is $(x, -y)$.

$X(2, -1) \rightarrow$

$Y(-4, -3) \rightarrow$

$Z(3, 2) \rightarrow$

Graph the image and preimage.



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Example 4B: Drawing Reflections in the Coordinate Plane

Reflect the figure with the given vertices across the given line.

$R(-2, 2)$, $S(5, 0)$, $T(3, -1)$; $y = x$

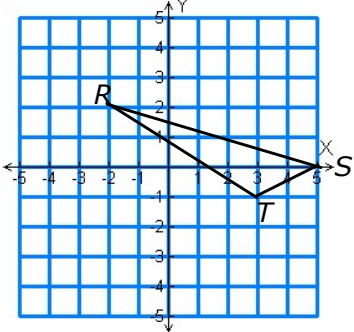
The reflection of (x, y) is (y, x) .

$R(-2, 2) \rightarrow$

$S(5, 0) \rightarrow$

$T(3, -1) \rightarrow$

Graph the image and preimage.



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Reflections

Check It Out! Example 4

Reflect the rectangle with vertices $S(3, 4)$, $T(3, 1)$, $U(-2, 1)$ and $V(-2, 4)$ across the x -axis.

The reflection of (x, y) is $(x, -y)$.

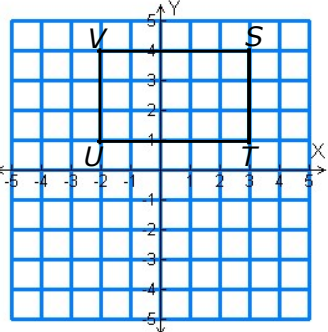
$S(3, 4) \rightarrow$

$T(3, 1) \rightarrow$

$U(-2, 1) \rightarrow$

$V(-2, 4) \rightarrow$

Graph the image and preimage.



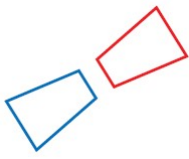
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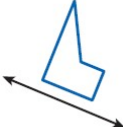
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Reflections

Lesson Quiz: Part I

1. Tell whether the transformation appears to be a reflection.


2. Copy the figure and the line of reflection. Draw the reflection of the figure across the line.



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Lesson Quiz: Part II

Reflect the figure with the given vertices across the given line.

3. $A(2, 3)$, $B(-1, 5)$, $C(4, -1)$; $y = x$
4. $U(-8, 2)$, $V(-3, -1)$, $W(3, 3)$; y -axis
5. $E(-3, -2)$, $F(6, -4)$, $G(-2, 1)$; x -axis

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