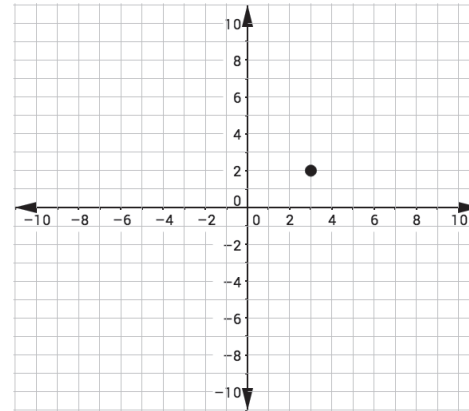


## Section 2 – Topic 6 Examining and Using Reflections

A **reflection** is a mirrored version of an object. The image does not change \_\_\_\_\_ but the figure itself reverses.

The function  $r_{line}(x, y)$  reflects the point  $(x, y)$  over the given line. For instance,  $r_{x-axis}(3, 2)$  reflects the point  $(3, 2)$  over the  $x$ -axis.

Let's examine the line reflections of the point  $(3, 2)$  over the  $x$ -axis,  $y$ -axis,  $y = x$ , and  $y = -x$ .



Reflection over	Notation	New coordinates
$x$ -axis	$r_{x-axis}(3, 2)$	
$y$ -axis	$r_{y-axis}(3, 2)$	
$y = x$	$r_{y=x}(3, 2)$	
$y = -x$	$r_{y=-x}(3, 2)$	

Make generalizations about reflections to complete the following table.

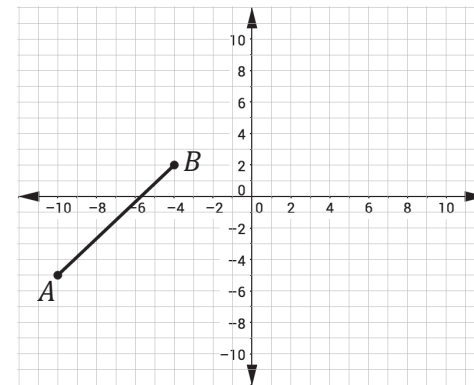
Reflection over	Notation	New coordinates
$x$ -axis	$r_{x-axis}(x, y)$	
$y$ -axis	$r_{y-axis}(x, y)$	
$y = x$	$r_{y=x}(x, y)$	
$y = -x$	$r_{y=-x}(x, y)$	

**Let's Practice!**

- Suppose the line segment whose endpoints are  $C(1, 3)$  and  $D(5, 2)$  is reflected over the  $y$ -axis, and then reflected again over  $y = x$ . What are the coordinates  $C''$  and  $D''$ ?

**Try It!**

- Suppose a line segment whose endpoints are  $A(-10, -5)$  and  $B(-4, 2)$  is reflected over  $y = -x$ .
  - What are the coordinates of  $A'(\_, \_)$  and  $B'(\_, \_)$ ?
  - Graph  $\overline{A'B'}$  on the coordinate plane below.



### **BEAT THE TEST!**

1. Consider the following points.

$F(-3, -10)$  and  $E(10, -3)$

Let  $\overline{F'E'}$  be the image of  $\overline{FE}$  after a reflection across line  $l$ . Suppose that  $F'$  is located at  $(-3, 10)$  and  $E'$  is located at  $(10, 3)$ . Which of the following is true about line  $l$ ?

- Ⓐ Line  $l$  is represented by  $y = -x$ .
  - Ⓑ Line  $l$  is represented by  $y = x$ .
  - Ⓒ Line  $l$  is represented by the  $x$ -axis.
  - Ⓓ Line  $l$  is represented by the  $y$ -axis.
2. Suppose a line segment whose endpoints are  $G(8, 2)$  and  $H(14, -8)$  is reflected over  $y = x$ .

What are the coordinates of  $G'(\_, \_)$  and  $H'(\_, \_)$ ?

