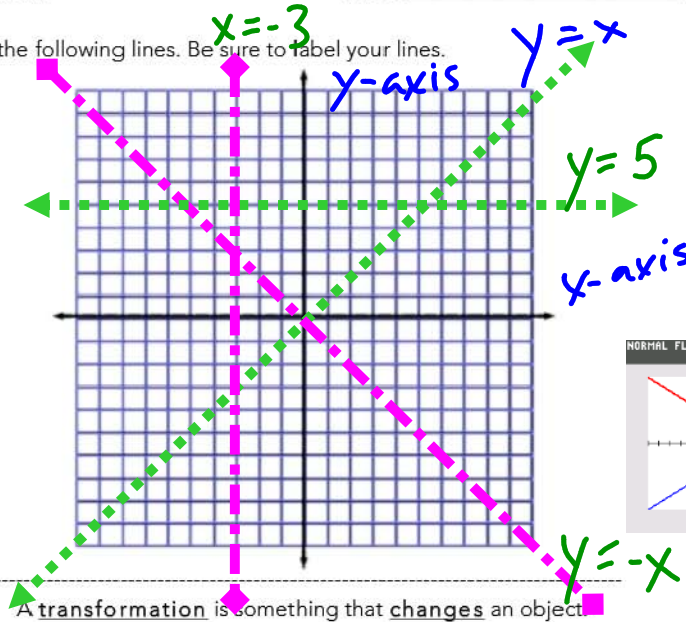


Geometry CC – Mr. Valentino  
Unit 4 Lesson 2: Reflections

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Period: \_\_\_\_\_

Do Now: Graph each of the following lines. Be sure to label your lines.

- y-axis ✓
- x-axis ✓
- y = x ✓
- y = -x ✓
- y = 5 ✓
- x = -3 ✓



A transformation is something that changes an object.

Reflection -

- A mirror of an image over a line
- notation  $r_{y=x}$  → reflection over the line  $y=x$
- each point is the same distance from the line of reflection as the original point but is on the opposite side of the line.

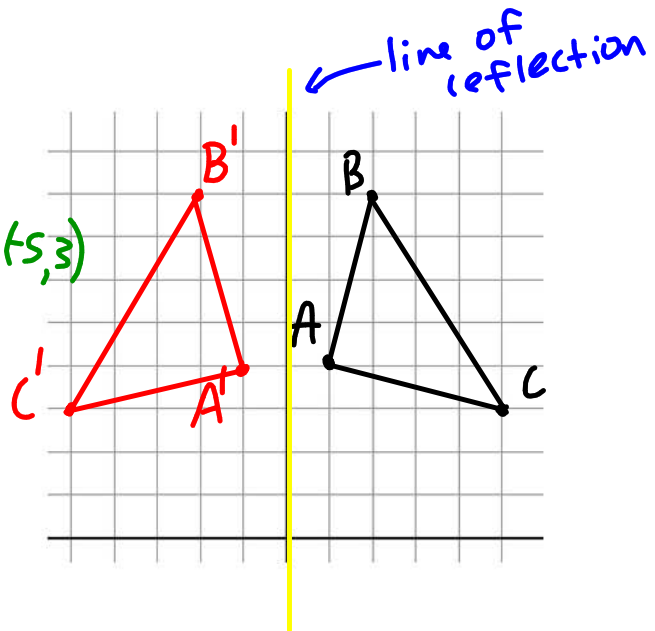
A) Line Reflections

1)  $\triangle ABC$  has coordinates: A(1, 4) B(2, 8) C(5, 3).

a) Graph  $\triangle ABC$ .  $A'(-1, 4)$   $B'(2, 8)$   $C'(5, 3)$

b) Graph  $\triangle A'B'C'$ , the image of  $\triangle ABC$  after a reflection in the y-axis

★ Reflection in the y-axis ★  
 $r_{y\text{-axis}}(x, y) = (-x, y)$



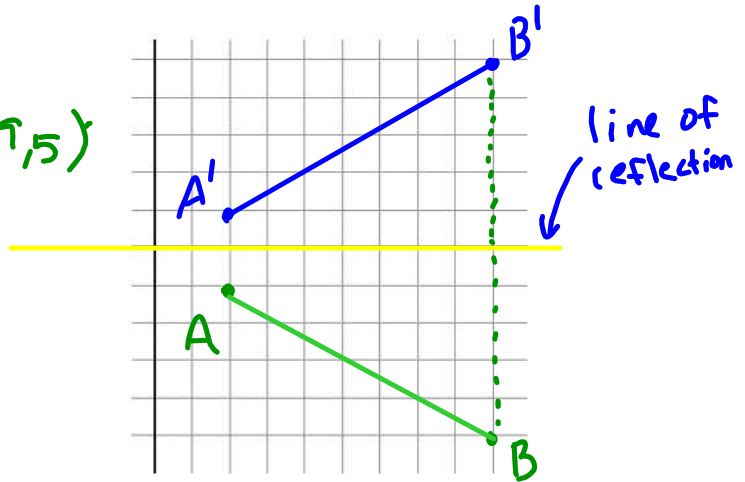
2)  $\overline{AB}$  has coordinates:  $A(2, -1)$   $B(9, -5)$ .

a) Graph  $\overline{AB}$ .  $A'(2, 1)$   $B'(9, 5)$

b) Graph  $\overline{A'B'}$ , the image of  $\overline{AB}$  after a reflection in the x-axis?

Reflection in the x-axis

$$r_{x\text{-axis}}(x, y) = (x, -y)$$



3) Reflection in the line  $y = x$

a) Graph the segment with endpoints  $A(3, 1)$  and  $B(5, 4)$ . Reflect this segment over the line  $y = x$ , and call its endpoints  $A'$  and  $B'$ . Find the coordinates of  $A'$  and  $B'$ .

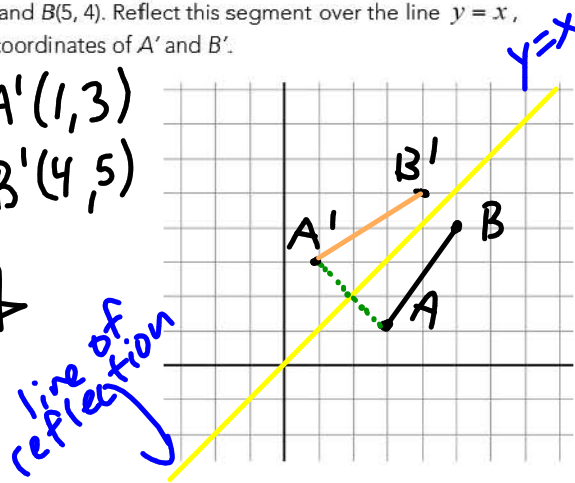
Reflection in the line  $y = x$

$$r_{y=x}(x, y) = (y, x)$$

$A'(1, 3)$   
 $B'(4, 5)$

Reflection in the line  $y = -x$

$$r_{y=-x}(x, y) = (-y, -x)$$

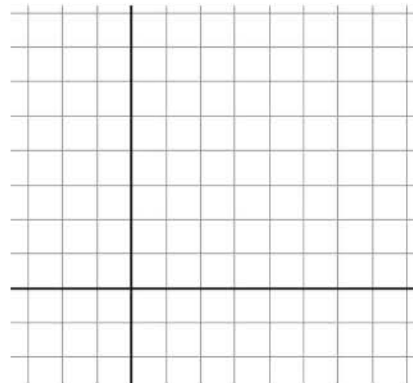


4) Reflection in the line  $x = 2$

a) Graph triangle ABC with vertices  $A(3, 0)$ ,  $B(3, 6)$ , and  $C(0, 6)$ .

Reflect this triangle over the line  $x = 2$  and call its endpoints  $A'$ ,  $B'$ , and  $C'$ . Find the coordinates of  $A'$ ,  $B'$  and  $C'$ .

$A(3, 0)$        $A' ( \quad , \quad )$   
 $B(3, 6)$        $B' ( \quad , \quad )$   
 $C(0, 6)$        $C' ( \quad , \quad )$

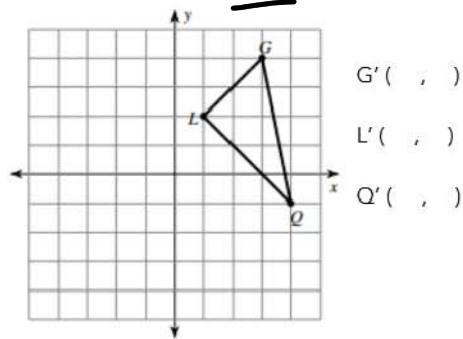


Important Features of a Reflection

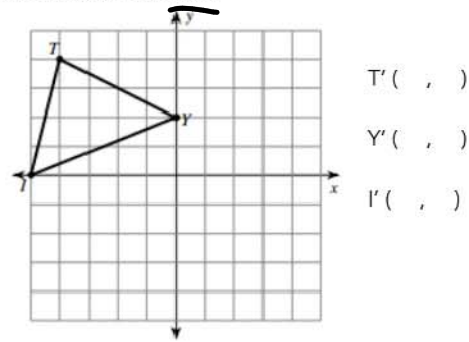
1. The size of the image is preserved
2. If a point lies on the line of symmetry, its location stays the same.
3. The distance between point A and the line of symmetry and point A' and the line of symmetry is the same.

Graph the image of the figure using the transformation given. State the coordinates of the image.

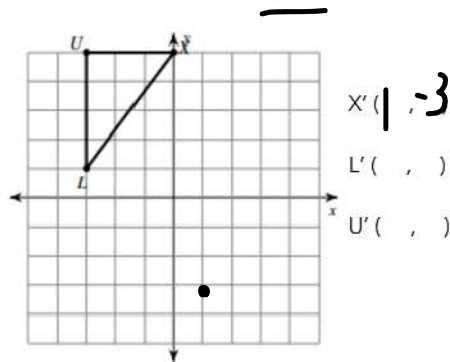
1. Reflection across the y-axis



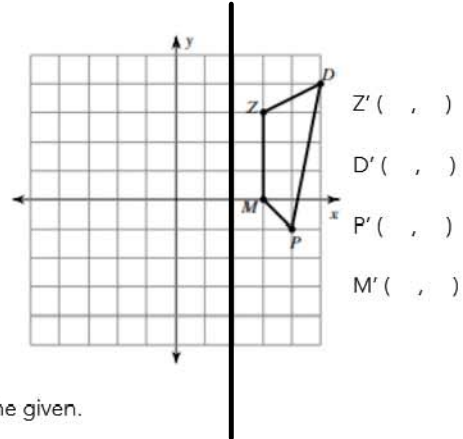
2. Reflection across the x-axis



3. Reflection across the line y = x



4. Reflection across the line x = 2



State the coordinate of the point after it is reflected in the line given.  
The first one is done as an example.

5)  $r_{x-axis}(4,5) = (4,-5)$

6)  $r_{x-axis}(1,9) =$

7)  $r_{y-axis}(2,8) =$

8)  $r_{y=x}(-10,-3) =$

9)  $r_{y-axis}(6,11) =$

10)  $r_{x-axis}(\text{kitten, face}) =$