



Name \_\_\_\_\_

## Lesson 13: Transformations Introduction

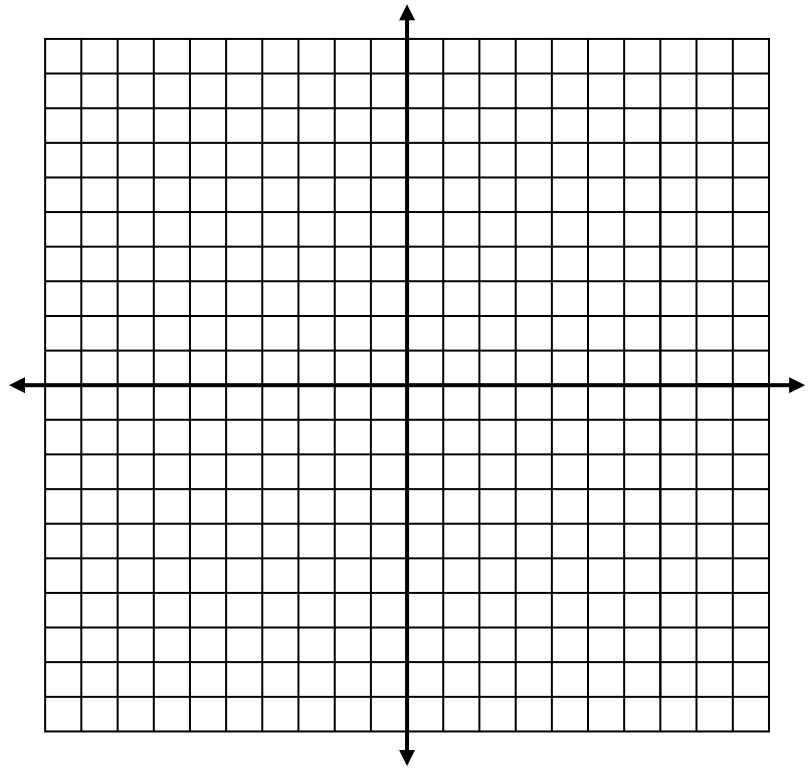
### Warm Up

Let's review the Coordinates of a Point in a plane.

1. Label:
  - a. Origin
  - b. x-axis
  - c. y-axis
  - d. Quadrants I, II, III, IV

### LEARNING TARGET

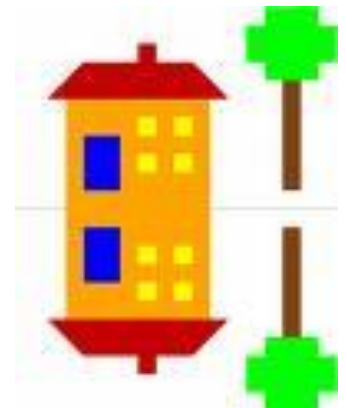
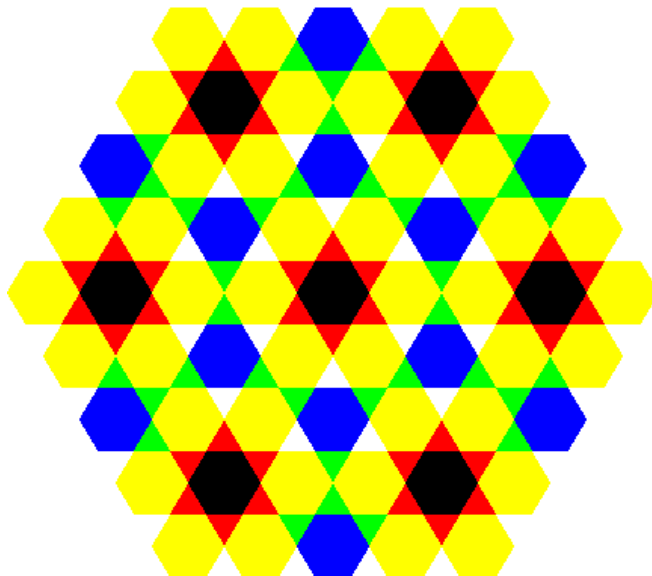
I CAN execute transformations of *reflections, translations, and rotations.*



### Mini Lesson

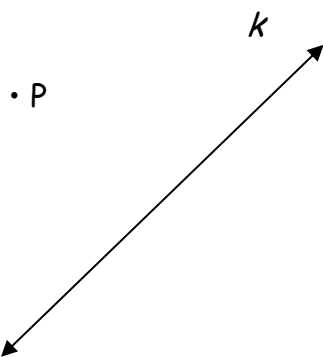
Reflection, Translation and Rotation:

#### I. Line Reflections and their properties

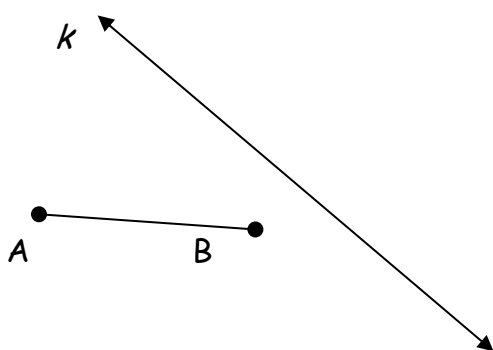


Reflection in line  $k$ :

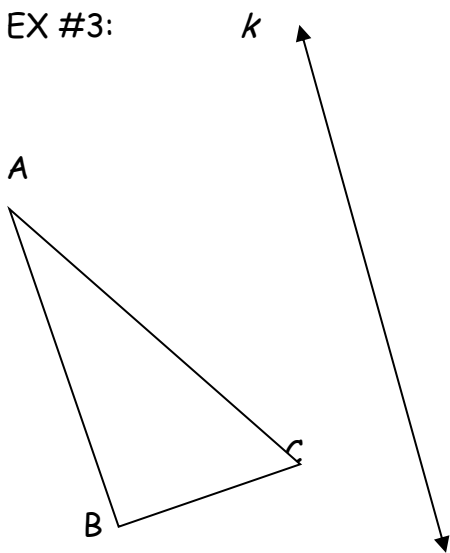
EX: #1



EX: #2



EX #3:



Looking at the last three examples, think about these questions:

1. Do you think the distance from A to B is the same as the distance from A' to B'?
2. Do you think  $\triangle ABC \cong \triangle A'B'C'$ ?

EX #4: The vertices of  $\triangle ABC$  are  $A(1, 9)$ ,  $B(8, 5)$ , and  $C(3, 2)$

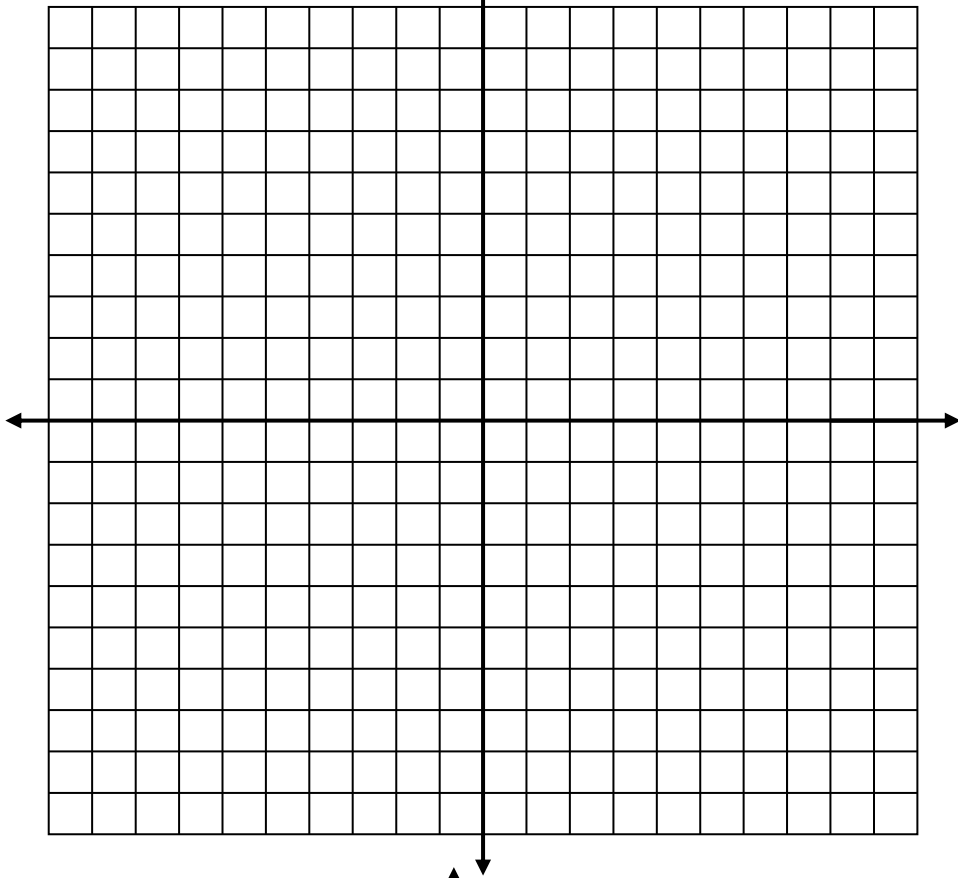
- a. Graph  $\triangle ABC$
- b. Graph its IMAGE after  $r_{y\text{-axis}}$

$A'( \quad , \quad )$   
 $B'( \quad , \quad )$   
 $C'( \quad , \quad )$

- c. What relationship did you notice about  $A$  and  $A'$ ?

- d. Graph the IMAGE of  $\triangle A'B'C'$  after  $r_{x\text{-axis}}$

$A''( \quad , \quad )$   
 $B''( \quad , \quad )$   
 $C''( \quad , \quad )$

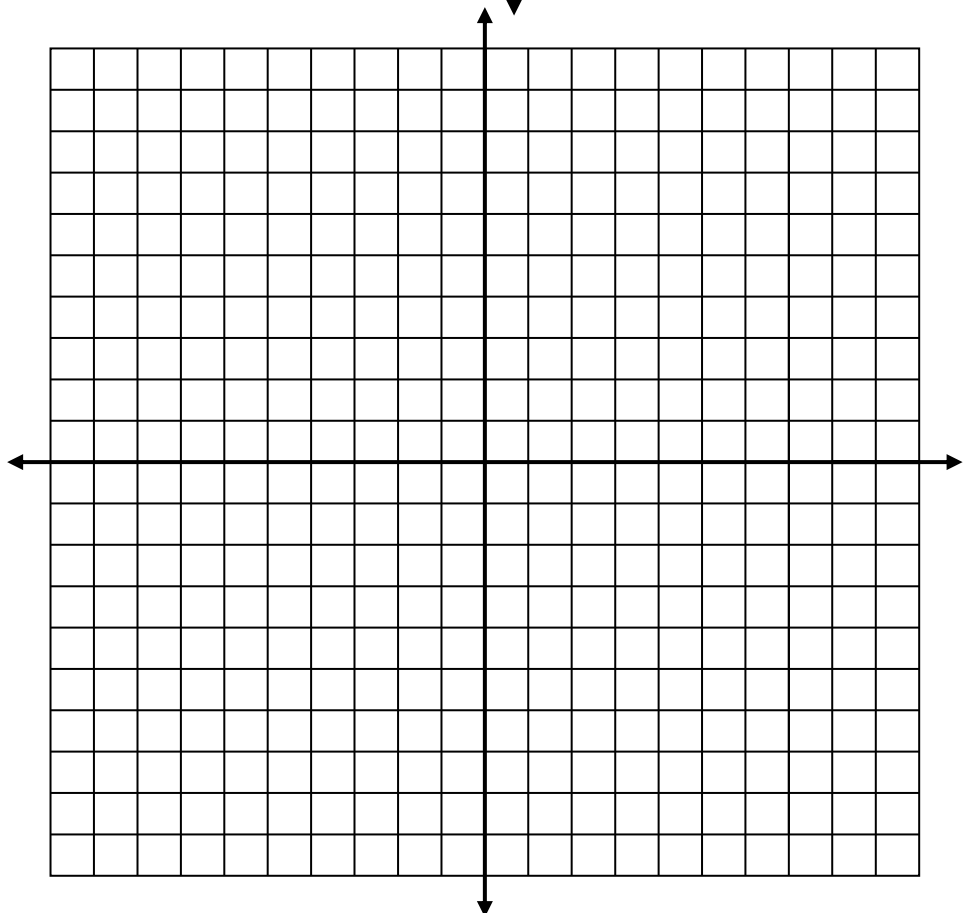


EX #5:

- a. Graph the line  $y = x$
- b. The vertices of  $\triangle XYZ$  are
- c.  $X(3, -6)$ ,  $Y(7, -6)$ , and  $Z(3, 1)$
- d. Graph its IMAGE after  $r_{y=x}$

$X'( \quad , \quad )$   
 $Y'( \quad , \quad )$   
 $Z'( \quad , \quad )$

- e. What relationship did you notice about  $X$  and  $X'$ ?



## II. Translation (slide):

### Ex #6:

1.  $P(2, -4) T_{(x-4, y+2)}$
2.  $P(2, -4) T_{-4, 2}$
3.  $Q(-5, 0) T_{(x-5, y-7)}$
4.  $R(-3, 2) T_{(x-2, y+7)}$
5.  $S(0, 8) T_{1, 3}$
6.  $W(3, -6) T_{(x-4, y-5)}$

### EX #7:

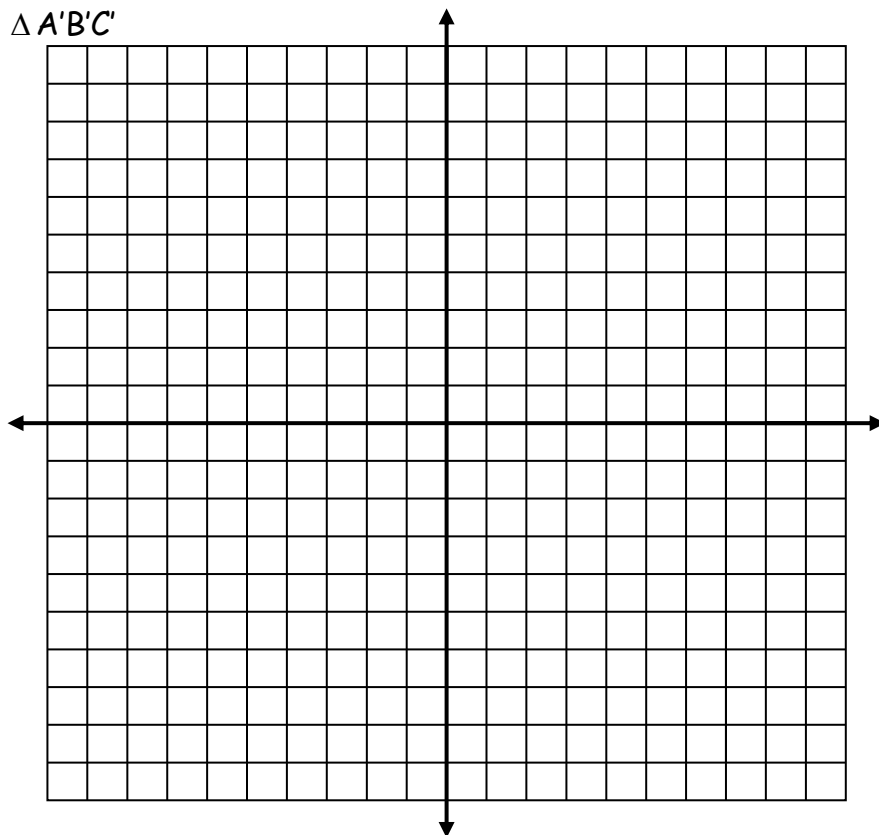
a. Graph  $\triangle ABC$ ,  $A(-8, 2)$ ,  $B(-6, 6)$  and  $C(-4, -2)$

b. Graph and state the coordinates of  $\triangle A'B'C'$

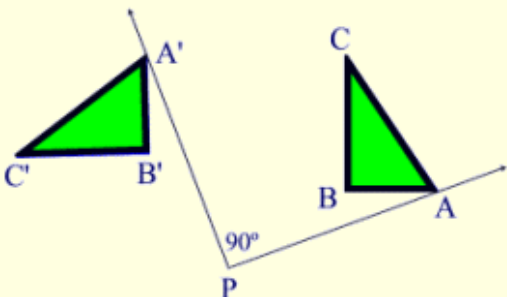
after  $T_{(x+7, y-7)}$

c. Graph  $\triangle A''B''C''$  after

$r_{x\text{-axis}} \triangle A'B'C'$



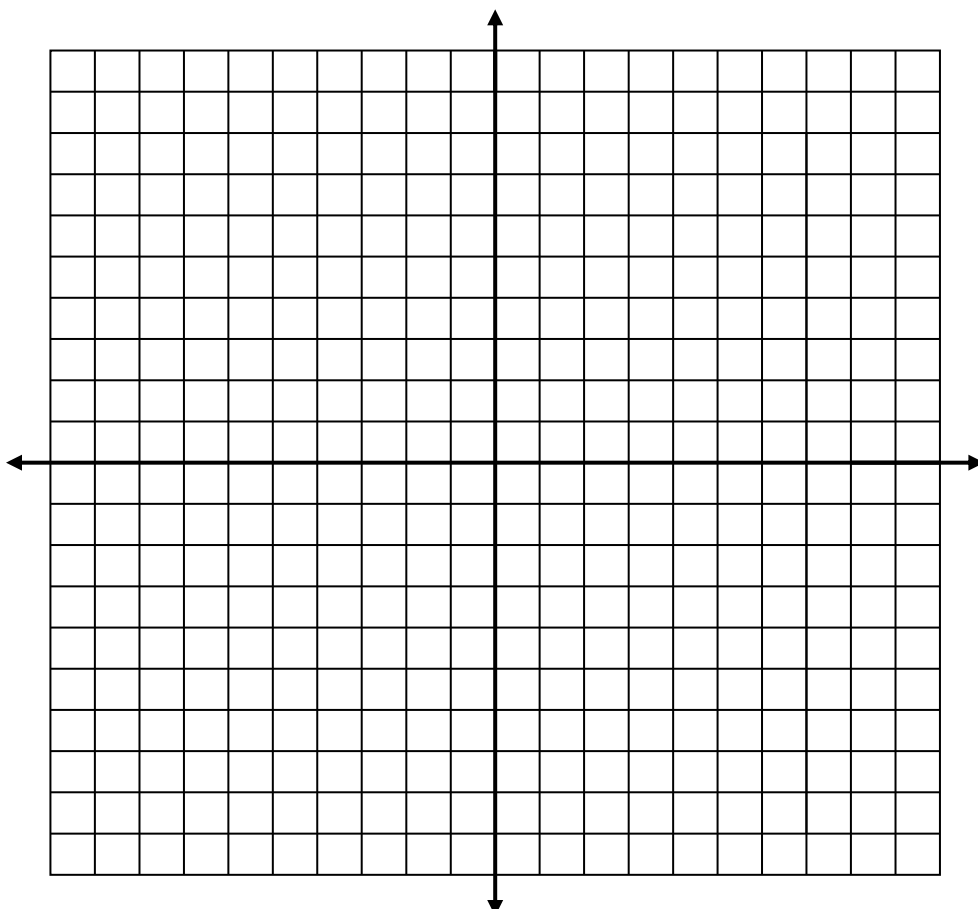
### III. Rotations:



**A rotation** is a transformation that turns a figure about a fixed point called the **center of rotation**. Rays drawn from the center of rotation to a point and its image form an angle called the **angle of rotation**.  
(notation  $R_{\text{degrees}}$ )

Ex 8:

- Graph  $\triangle ABC$  whose vertices are  $A(0, 0)$ ,  $B(3, 0)$  and  $C(3, 4)$ .
- Graph and state the coordinates of  $\triangle A'B'C'$  after  $R_{90} \triangle ABC$ .



Name \_\_\_\_\_

Classwork/Homework

**Lesson 13: Transformations Introduction**

1. a. Graph  $\triangle ABC$  where  
 $A(1,1)$   
 $B(7,5)$   
 $C(3, 8)$

- b. Graph  $\triangle A'B'C'$  after

$$r_{x\text{-axis}} \triangle ABC$$

$$A'( \quad , \quad )$$

$$B'( \quad , \quad )$$

$$C'( \quad , \quad )$$

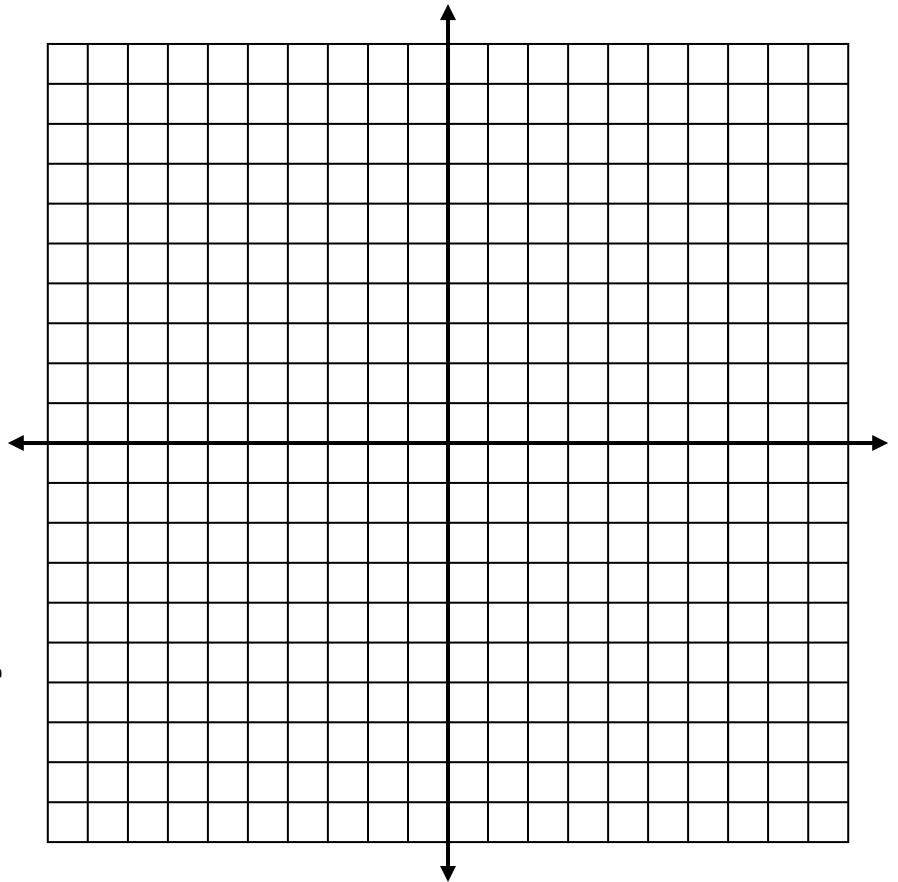
- c. Graph  $\triangle A''B''C''$  after

$$r_{y\text{-axis}} \triangle A'B'C'$$

$$A''( \quad , \quad )$$

$$B''( \quad , \quad )$$

$$C''( \quad , \quad )$$



2. a. Graph Quad ABCD where

$$A(4, -9)$$

$$B(9, -9)$$

$$C(8, -2)$$

$$D(4, -4)$$

b. Graph Quad  $A'B'C'D'$  after

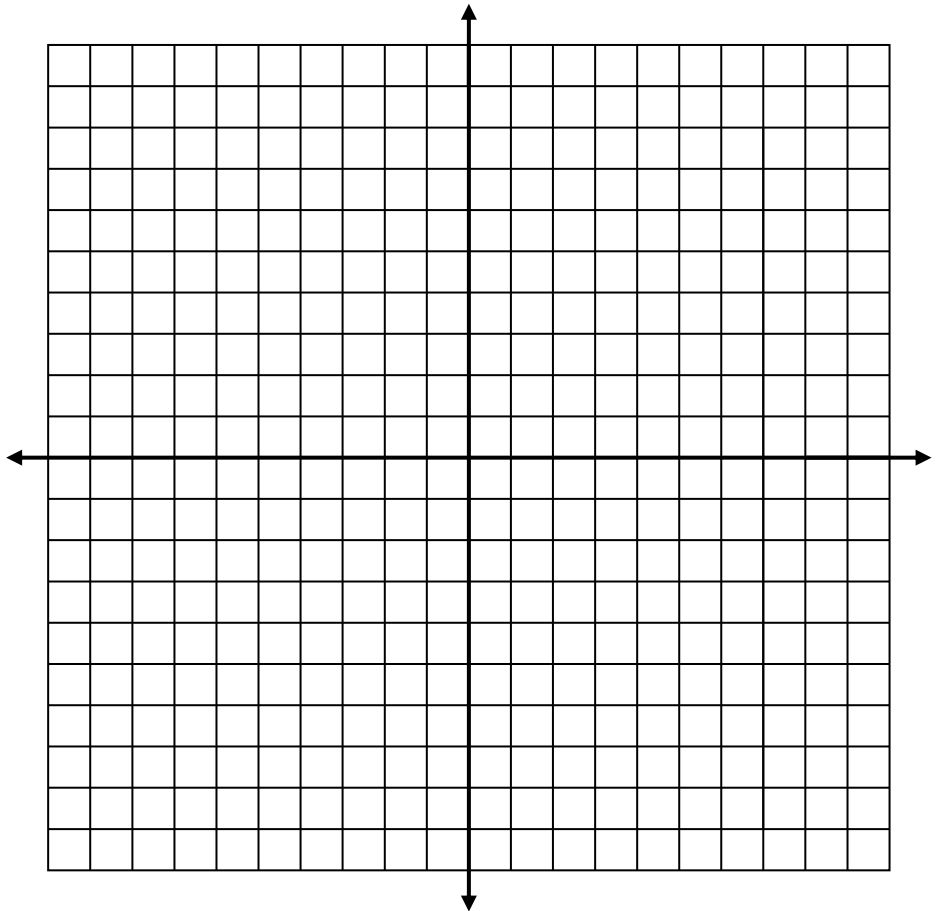
$r_{y=x}$  Quad

$$A'(\quad, \quad)$$

$$B'(\quad, \quad)$$

$$C'(\quad, \quad)$$

$$D'(\quad, \quad)$$



c. Graph Quad  $A''B''C''D''$  after

$r_{y-axis}$  Quad  $A'B'C'D'$

$$A''(\quad, \quad)$$

$$B''(\quad, \quad)$$

$$C''(\quad, \quad)$$

$$D''(\quad, \quad)$$