Warm-Up

1. For the translation $(x, y) \rightarrow (x - 5, y + 4)$, tell where the image for quadrilateral pre-image ABCD would be located.

A (-4, 6)→A' _____ C (-3, 1)→C' _____

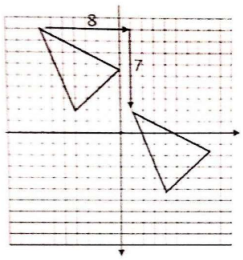
B (-8, 7)→B' _____ D (-2, 2)→D' _____

Advanced Geometry
Section 1.1 Translations Homework

Name_____

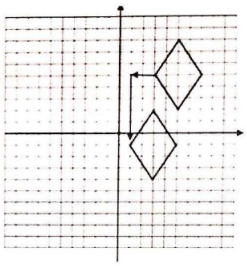
1. Describe each of the translations below. Then, write the transformation rule that maps the pre-image onto the image.

a)



$(x, y) \rightarrow (x + 8, y - 7)$

b)



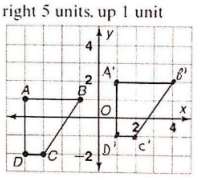
$(x, y) \rightarrow (x - 2, y - 6)$

2. a) Name the coordinates of the pre-image to the right.

A (-4, 1) B (-1, 1)

C (-3, -2) D (-4, -2)

right 5 units, up 1 unit



b) Use arrow notation to write a rule for the given translation.

$(x, y) \rightarrow (x + 5, y + 1)$

c) Graph and label the image after the translation.

d) Name the coordinates of the image.

A' (1, 2) B' (4, 2)

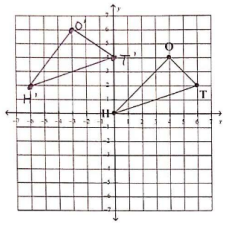
C' (2, -1) D' (1, -1)

3. MULTIPLE CHOICE: Write a description of the rule $(x, y) \rightarrow (x - 7, y + 4)$.

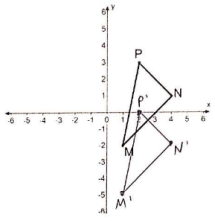
(a) translation 7 units to the right and 4 units up
(b) translation 7 units to the left and 4 units down
(c) translation 7 units to the right and 4 units down
(d) translation 7 units to the left and 4 units up

4. Apply the given transformation to each triangle below. Label the images appropriately.

a) $(x, y) \rightarrow (x-6, y+2)$

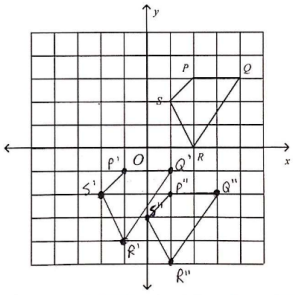


b) $(x, y) \rightarrow (x, y-3)$



5. Quadrilateral *PQRS* is plotted on the grid below.

a) On the graph, draw the translation of polygon *PQRS* three units to the left and four units down. Label the image *P'Q'R'S'*.



b) Now create polygon *P"Q"R"S"* by translating polygon *P'Q'R'S'* using the rule $(x, y) \rightarrow (x+2, y-1)$. List the coordinates of *P"Q"R"S" below*

P" (1, -2) Q" (3, -2) R" (1, -5) S" (0, -3)

c) Write a general rule which translates polygon *PQRS* to polygon *P"Q"R"S"*.

$(x, y) \rightarrow (x-1, y-5)$

Transformations Day 2 - Reflections

Learning Target:

Coordinate Geometry: Transformations

a. I can apply ordered pair rules to basic translations, rotations and reflections.

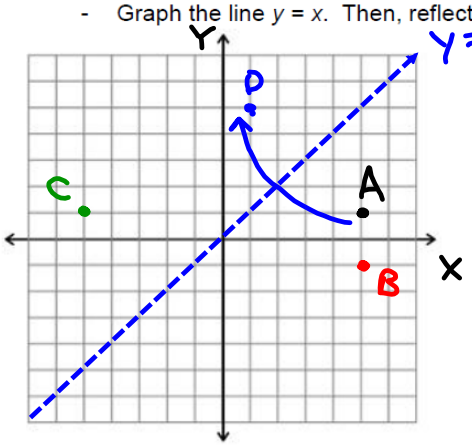
Definitions:

REFLECTIONS: A transformations which creates a mirror image of a given pre-image over a given line.

LINE OF REFLECTION: The line over which a pre-image is reflected over.

On the coordinate plane below…

- Graph the coordinate pre-image (5, 1) and label it with the letter A.
- Reflect point A over the x-axis and label that image B.
- Reflect point A over the y-axis and label that image C.
- Graph the line $y = x$. Then, reflect point A over the line $y = x$ and label that image D.



Start (5, 1)

List the coordinates of each of the resulting images:

Coordinates of image of B: (5 , -1) x-axis

Coordinates of image of C: (-5 , 1) y-axis

Coordinates of image of D: (1 , 5) y = x

Reflection Transformation Rules:

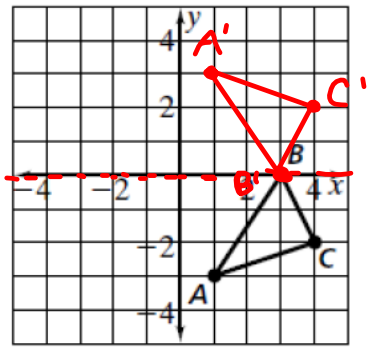
In general, list the transformation rule for each of the following reflections:

Over the x-axis: $(x, y) \rightarrow (\ x\ , -y\ )$ Over the y-axis: $(x, y) \rightarrow (-x, y)$

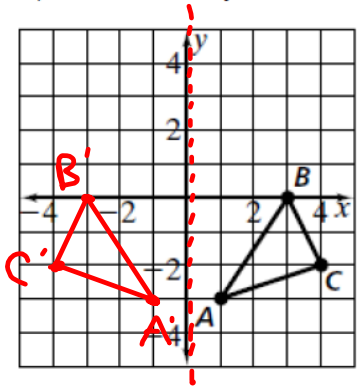
Over the line $y = x$: $(x, y) \rightarrow (\ y\ ,\ x\ )$

1. Reflect the triangle below over each of the following lines. Label the images ΔA'B'C'

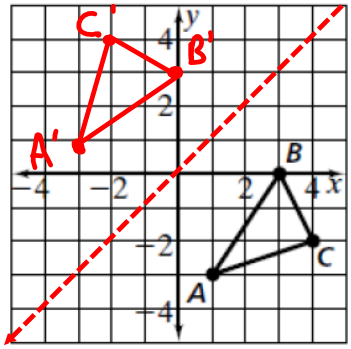
a) Over the x-axis.



b) Over the y-axis.



c) Over the line $y = x$.



2. a) Draw ΔJKL which has coordinates J (0,2), K (-3,-4), and L (5,-1).

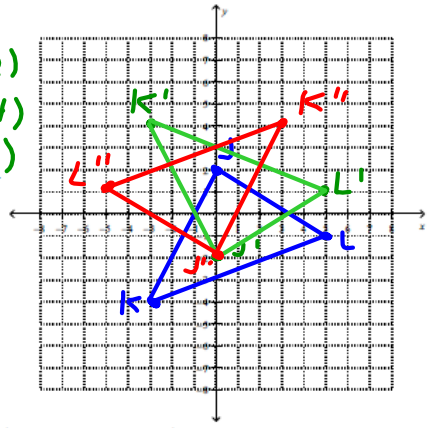
b) Draw the image $\Delta J'K'L'$ after a reflection of ΔJKL over the x-axis.

c) List the coordinates of $J'K'L'$.

J (0, 2) → J' (0,-2)

K (-3, -4) → K' (-3,4)

L (5, -1) → L' (5, 1)



d) Draw the image $\Delta J''K''L''$ after a reflection of $\Delta J'K'L'$ over the y-axis.

(-x, y)

e) List the coordinates of $J''K''L''$.

J' (0,-2) → J'' (0,-2)

K' (-3,4) → K'' (3,4)

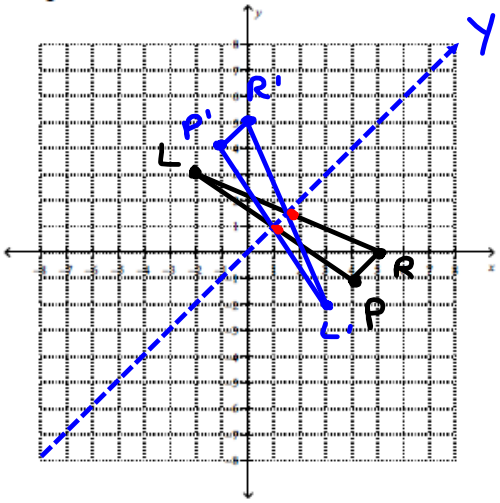
L' (5,1) → L'' (-5,1)

Would the final image be different if the reflections were done in the opposite order?

Is this always true?

3. a) Draw ΔPRL which has coordinates P (4,-1), R (5, 0), and L (-2, 3).

b) Draw the image $\Delta P'R'L'$ after a reflection of ΔPRL over the line $y = x$.



y = x

(x, y) → (y, x)

P'(-1, 4)

R'(0, 5)

L'(3, -2)

Example 4:

a) Draw ΔABC which has coordinates $A(0,1)$, $B(3,4)$, and $C(5,1)$.

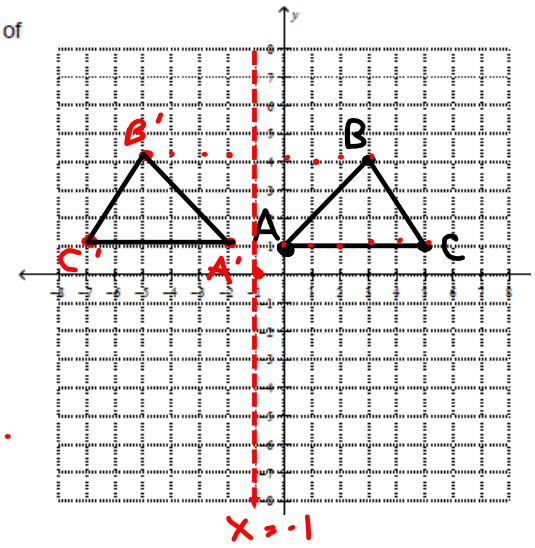
b) Draw the image $\Delta A'B'C'$ after a reflection of ΔABC over $x = -1$.

c) List the coordinates of $A'B'C'$.

A (0, 1) → A' _____

B (3, 4) → B' _____

C (5, 1) → C' _____



The line $x = -1$ is a vertical line.

$y = mx + b$

$y = c$ horizontal $x = c$ vertical

Example 5:

a) Draw ΔABC which has coordinates $A(0,1)$, $B(3,4)$, and $C(5,-3)$.

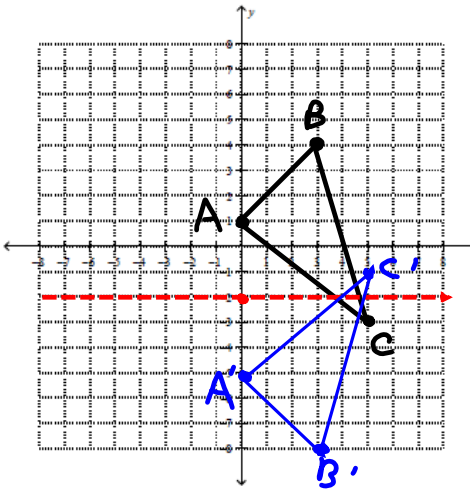
b) Draw the image $\Delta A'B'C'$ after a reflection of ΔABC over $y = -2$.

c) List the coordinates of $A'B'C'$.

A (0, 1) → A' (0, -5)

B (3, 4) → B' (3, -8)

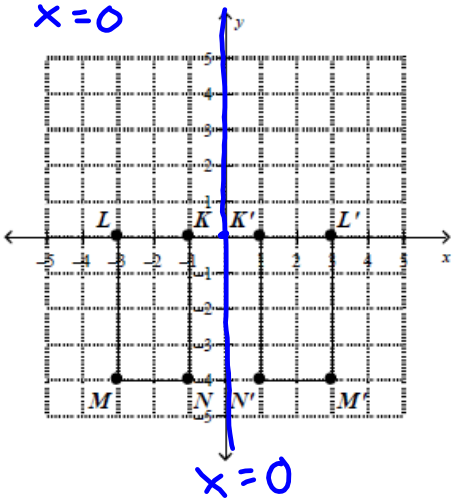
C (5, -3) → C' (5, -1)



The line $y = -2$ is horizontal.

Example 6:

Draw the line of reflection which caused rectangle *KLMN* to reflect onto rectangle *K'L'M'N'*. What is the equation of the line of reflection?



Example 7:

Draw the line of reflection which caused triangle *ABC* to reflect onto triangle *A'B'C'*. What is the equation of the line of reflection?