Arrow notation recap for translations

Move ΔABC 3 units right, 7 units down

$(x, y) \rightarrow (x+3, y-7)$ New triangle $\Delta A'B'C'$

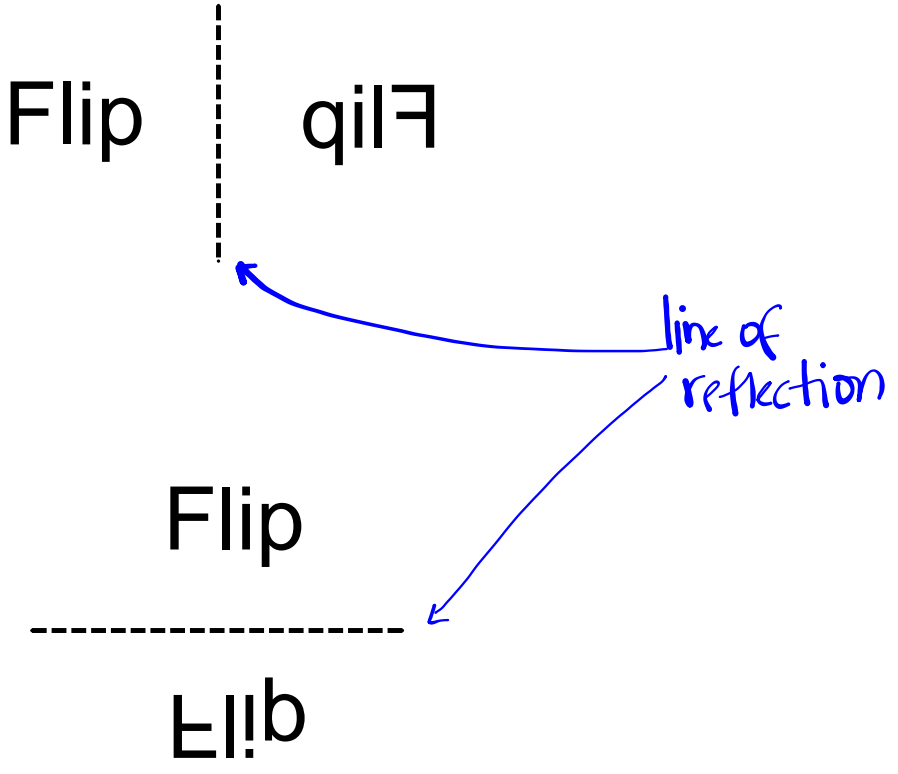
Move ΔDEF 6 units left

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

New transformation ...

REFLECTION

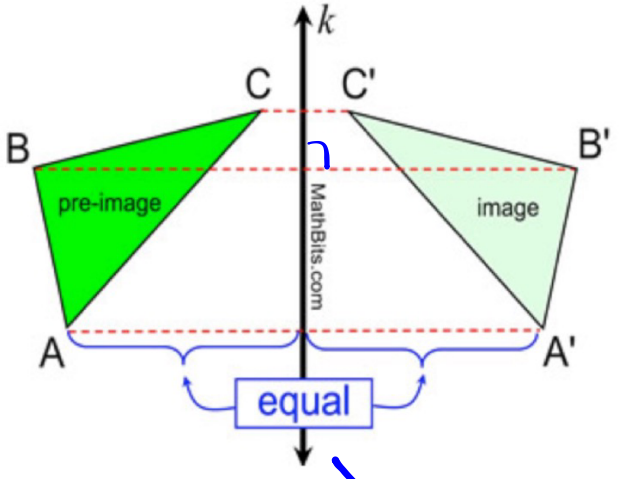
Reflection



Reflections - Notes

A **reflection** is a transformation which flips the figure over a line.

This line is called the Line of Reflection.



Line of Reflection

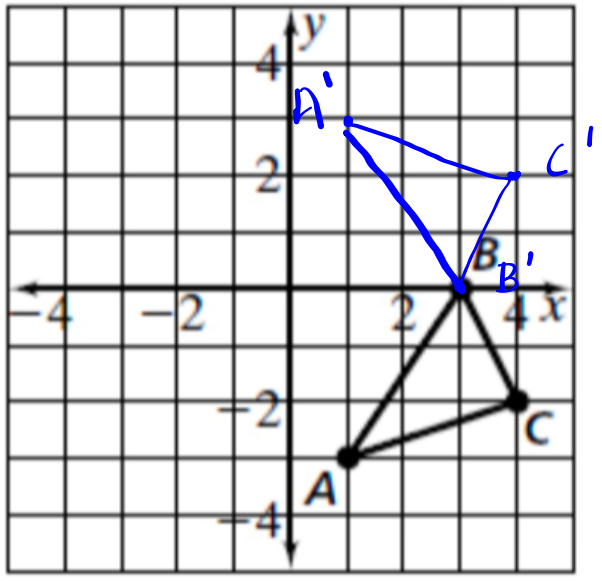
Rules for Reflections:

- Every point of the Image is moved to the other side of the line of reflection.
- Each point in the Image is the same distance from the line of reflection as the corresponding point in the preimage.
- The image is reflected at a 90° angle to the Line of Reflection.
- The image and the preimage are congruent.

Example 1:

ΔABC is being reflected over the x-axis.

Draw and label the image $\Delta A'B'C'$.



What are the coordinates of:

A (1, −3) → A′ (1, 3)

B (3, 0) → B′ (3, 0)

C (4, −2) → C′ (4, 2)

Can you write a general rule for a reflection across the x-axis?

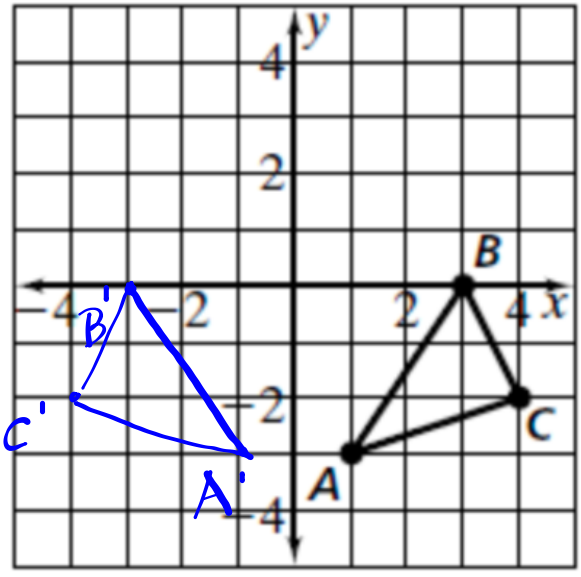
$(x, y) \rightarrow (\ x\ ,\ -y\ )$.

You do NOT have to memorize rules like this!

Example 2:

Δ*ABC* is reflected over the *y*-axis.

Draw the image Δ*A'B'C'*.



What are the coordinates of:

A (1, −3) → *A'* (−1, −3)

B (3, 0) → *B'* (−3, 0)

C (4, −2) → *C'* (−4, −2)

Write a general rule for a reflection over the *y*-axis:

(*x*, *y*) → (−x , y).

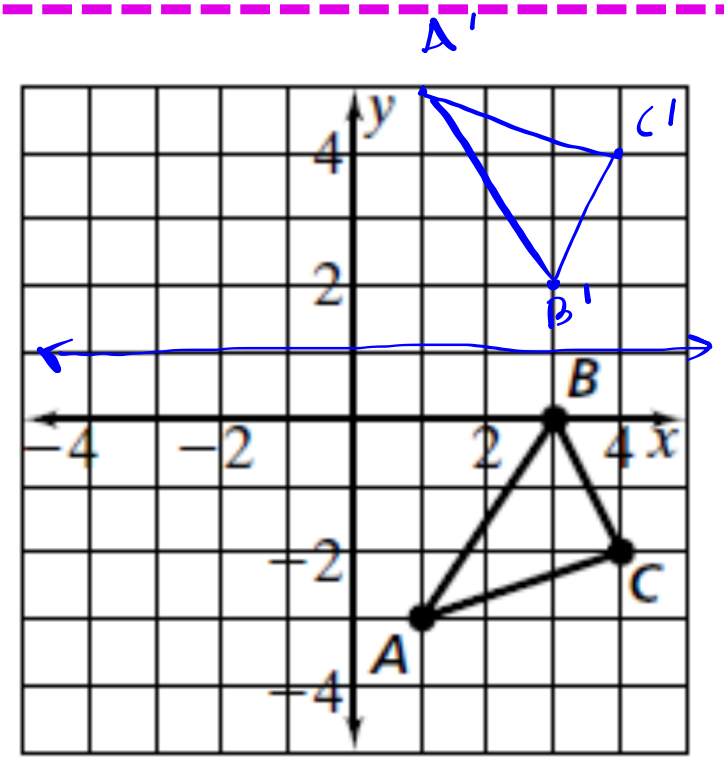
You do NOT have to memorize rules like this!

We can also reflect over a line that is not an axis.

Example 3:
ΔABC is reflected over the line $y = 1$. Draw the image $\Delta A'B'C'$.

Steps to reflecting over a line that is not one of the axes:

1. Draw your line of reflection on the graph
2. Move each point perpendicular **across** the line so that the new point is the same distance from the line of reflection as the original point.



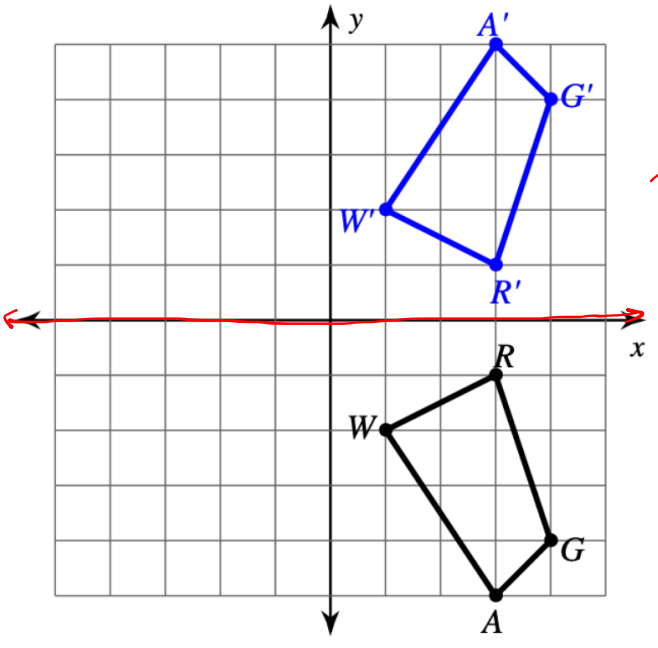
y = 1

y = 1

y = 0x + 1

Example 4:
Write the reflections that must have occurred.

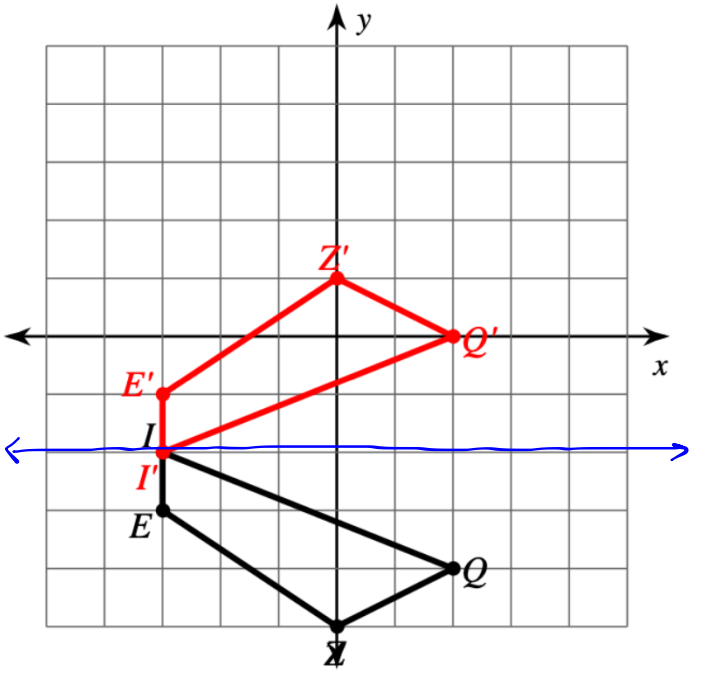
A.



Reflect over x-axis

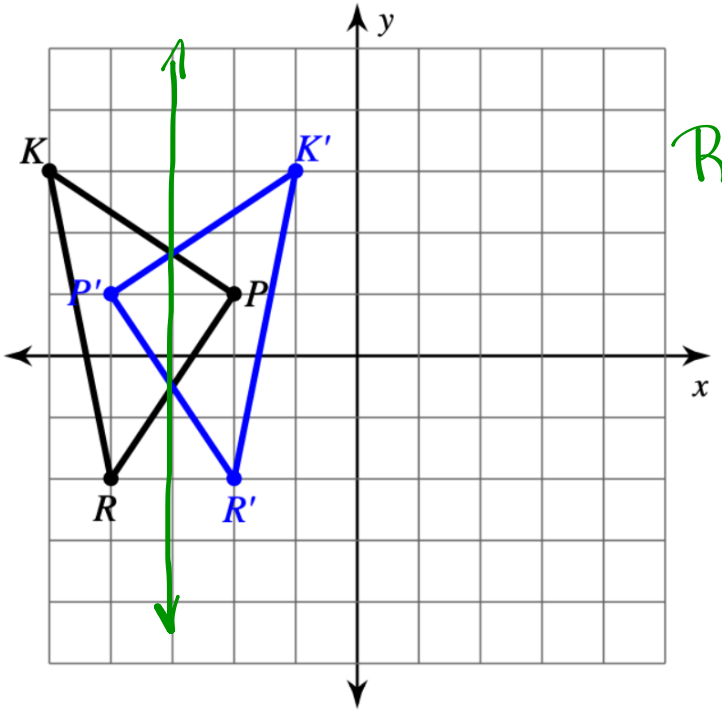
Example 4:
Write the reflections that must have occurred.

B.



Reflect over $y = -2$

Example 5:
Write the reflection that must have occurred.



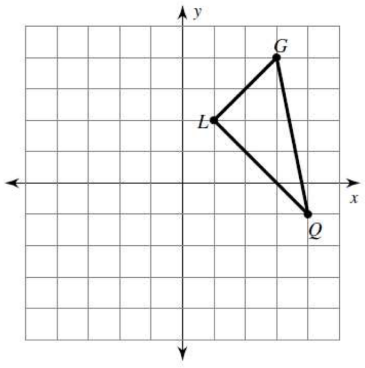
Reflect over
$x = -3$

Reflections of Shapes

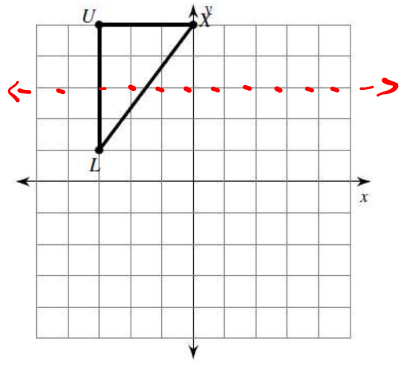
Date_____ Period____

Graph the image of the figure using the transformation given.

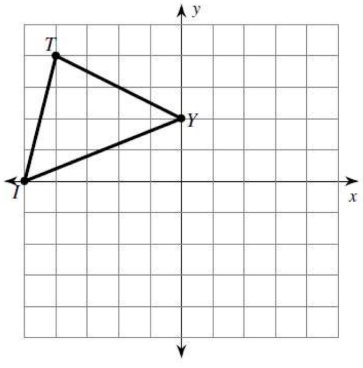
1) reflection across the x-axis



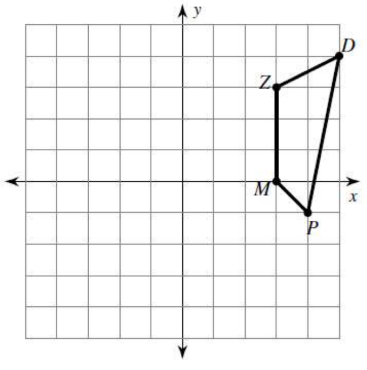
2) reflection across $y = 3$



3) reflection across $y = 1$

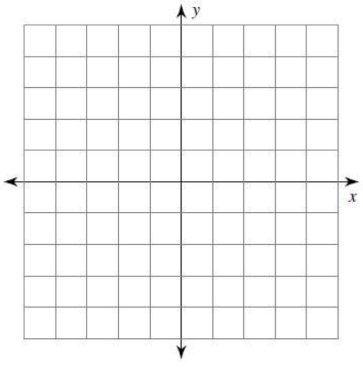


4) reflection across the x-axis



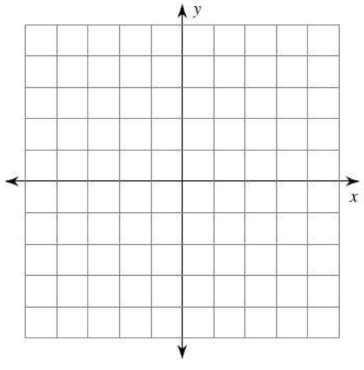
5) reflection across the x-axis

$T(2, 2)$, $C(2, 5)$, $Z(5, 4)$, $F(5, 0)$



6) reflection across $y = -2$

$H(-1, -5)$, $M(-1, -4)$, $B(1, -2)$, $C(3, -3)$



Find the coordinates of the vertices of each figure after the given transformation.

7) reflection across the x-axis
$K(1, -1)$, $N(4, 0)$, $Q(4, -4)$

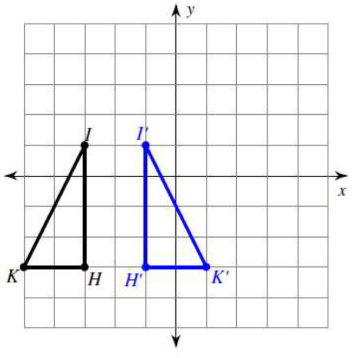
8) reflection across $y = -1$
$R(-3, -5)$, $N(-4, 0)$, $V(-2, -1)$, $E(0, -4)$

9) reflection across $x = 3$
$F(2, 2)$, $W(2, 5)$, $K(3, 2)$

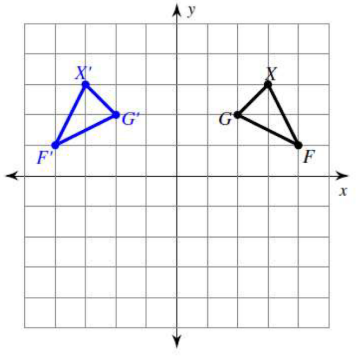
10) reflection across $x = -1$
$V(-3, -1)$, $Z(-3, 2)$, $G(-1, 3)$, $M(1, 1)$

Write a rule to describe each transformation.

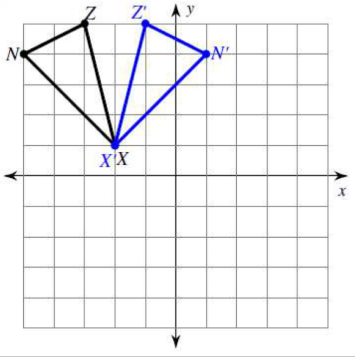
11)



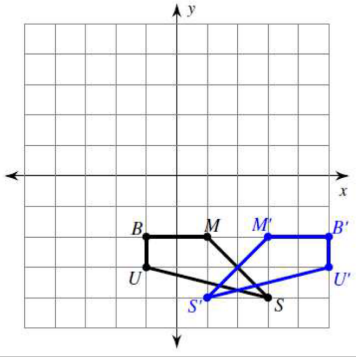
12)



13)



14)



Homework

Finish classwork