**Formal Geometry 3.1 Guided Notes: Reflections**

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a line maps a point to its image such that:

* If the point is on the line, then the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are the same point.
* If the point does not lie on the line, the line is the \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the segment joining the pre-image and image.

Reflect the given figure in the line *y* = -1.$y=-3.$ Reflect the given figure in the line $x=2.$

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**Reflection in the *x*-axis**: **Reflection in the *y*-axis:**

Reflection in the line $y=x.$

 

**Summary:**

**Reflection in the *x*-axis Reflection in the *y*-axis Reflection in the line** $y=x.$ **Reflection in the line** $y=-x$

**Formal Geometry 3.2 Guided Notes: Translations**

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ maps each point to its image along a vector, such that:

* Each segment joining a point and its image has the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ as the vector, and
* This segment is also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the vector.
* If you translate a point along the vector $\left〈a, b\right〉$, add *a* to the \_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and

 add *b* to the \_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 Translate the given figure along $\left〈-3, -2\right〉.$ Translate the given figure along$ \left〈4, -6\right〉.$

Write the translation vector for Write the translation vector for

 $∆ABC to ∆A'B'C'$ $∆ABC to ∆A'B'C'$

A’

B’

C’

Coordinate Notation to describe a translation:

**Example 1**: Translate the given figure along **Example 2**: Write the translation (in

$\left(x, y\right)\rightarrow (x+2, y-3)$. **coordinate form)** for the movement shown.



**Putting it all together:**

Lance claims the transformation below can be done **Example 3:** Draw line $\overleftrightarrow{BC} $and point A, which is

by reflecting the preimage (in quadrant I) in the not on $\overleftrightarrow{BC}$. Reflect A in $\overleftrightarrow{BC}$ to create $A'$. Draw

y-axis, translating along $\left〈-4, 0\right〉$, then reflecting in points E and F on $\overleftrightarrow{BC}.$ Name all congruent

the x-axis. segments in the diagram.

Sara is confident it can be done in 2 steps: reflect in

the x-axis then translate $\left(x, y\right)\rightarrow (x-8, y)$.

Joseph says that it can be translated first, then

reflected.

Who is correct?



**3.3 Notes: Rotations**

Rotations about the Origin

Clockwise: Counter-Clockwise:



**3.4 Guided Notes: Composition of Transformations**

* A ***Composition of Transformations*** is when a transformation is applied to a figure and then another transformation is applied to its image.

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**Example #2:** Graph $\overbar{WX}$: W(-5, 2) and X(-5, -3) and its Ex 3: Graph $∆ABC$: A(2, -1), B(5, -2), and C(3, -4)

image after a reflection in the $x-axis$ and a rotation and its image after a translation along $\left〈-1, 5\right〉$

90° about the origin. and a rotation 180° about the origin.



**Ex 4**: The triangle shown is reflected in line *m* and then reflected in line *p.* Draw the figure $D’’$, and then describe the transformation that maps D onto $D’’$ in a single transformation.

D

*m*

*p*

5 inches

**Ex 5**: The triangle shown is reflected in line *m* and then reflected in line *p.* Draw the figure $D’’$, and then describe the transformation that maps D onto $D’’$ in a single transformation.

D

*m*

*p*

28o

**Ex 6**: Graph $∆ABC$: A(7, -4), B(5, -1), and C(9, 0). Rotate the figure 90° about the point (4, -5). Then reflect the figure over the line y =1.

 What are the coordinates of $A’ $?

 What are the coordinates of $A’’ $?







