

9-1 Reflections

Transformation:

- * One-to-one correspondence between the preimage and the image.
- * Every point in the original goes to only one point in the new figure.
- * Examples of Transformations:
reflections, translations, rotations,
and dilations.

Preimage-

- * The figure we start with.

Image:

- * The figure we end up with.
- * The points will be labeled with a prime symbol (usually). Y' , X'

Reflection:

- * Transformation that flips a figure.
- * Can be reflected over a point, line, or plane.

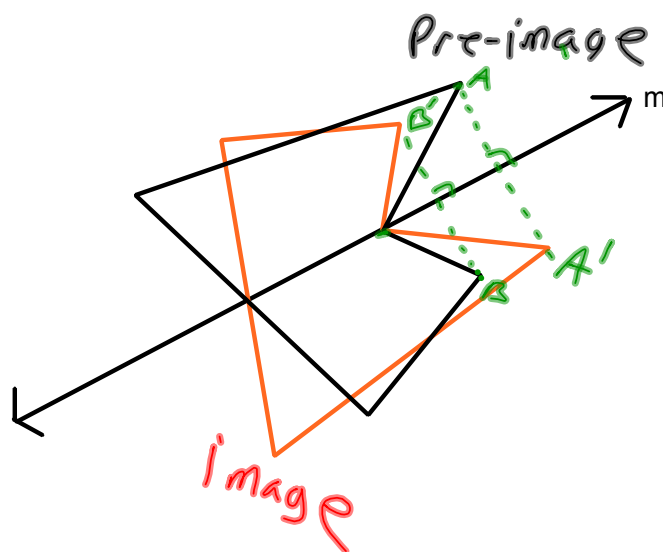
Line of Reflection:

- * The line we reflect over.
- * If a point is on the reflecting line, it will stay on the reflecting line.
- * Always reflect over the line at a 90° angle.

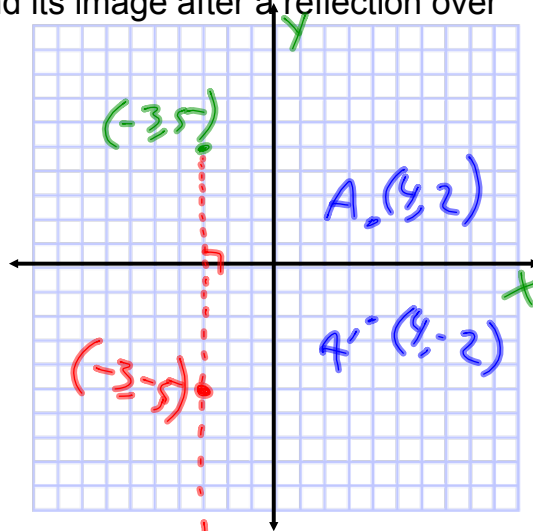
Isometry:

- * A congruence transformation.
- * A reflection is an isometry.

Reflections will preserve distance, angle measure, collinearity, and betweenness of points. The image is congruent to the preimage.



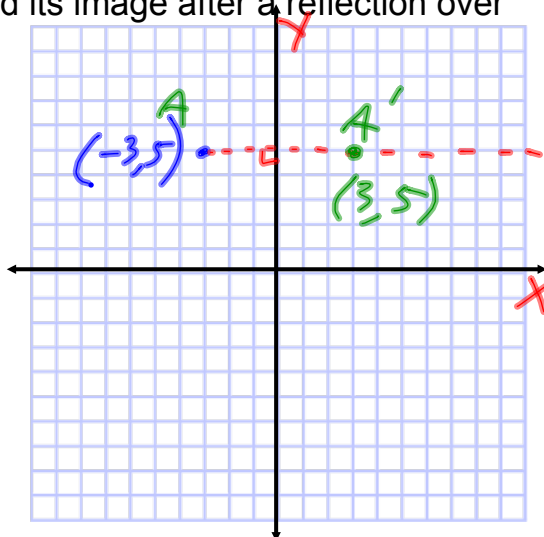
1.) Graph the point $(-3,5)$ and its image after a reflection over the x-axis.



Reflection over the x-axis:

- * Changes the y- coordinate.
- * Multiply the y-coordinate by -1 .
- * **$A(x, y)$ then $A'(x, -y)$.**

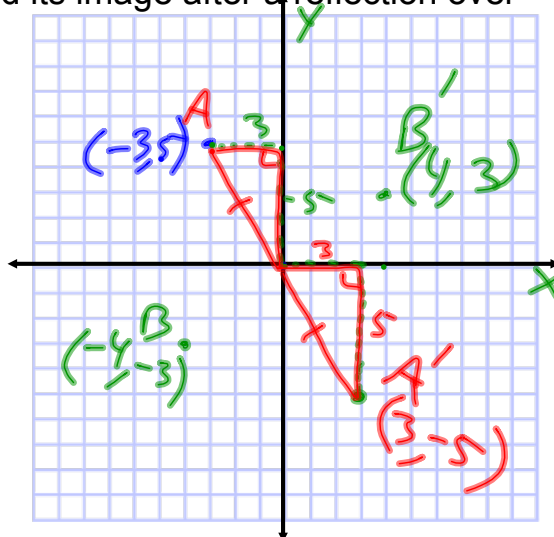
2.) Graph the point $(-3,5)$ and its image after a reflection over the y-axis.



Reflection over the y-axis:

- * Changes the x- coordinate.
- * Multiply the x-coordinate by -1 .
- * **$A(x, y)$ then $A'(-x, y)$.**

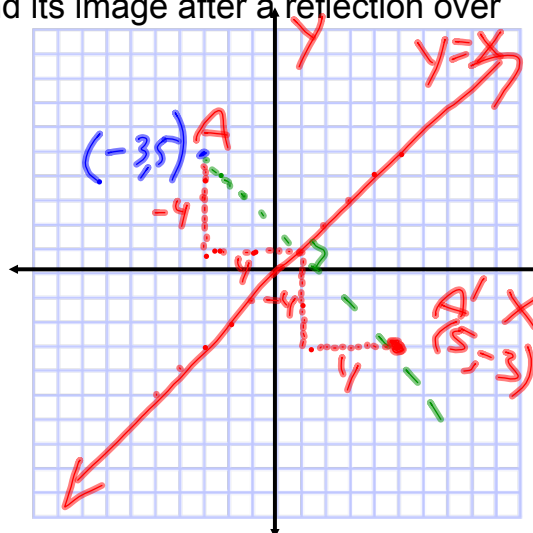
3.) Graph the point $(-3,5)$ and its image after a reflection over the origin.



Reflection in the origin:

- * Both signs switch. (Multiply both x and y by -1)
- * $A = (x, y)$ $A' = (-x, -y)$

4.) Graph the point $(-3,5)$ and its image after a reflection over the line $y=x$.



Reflection over the line $y = x$:

- * Changes the positions of the coordinates.
- * $A (x, y)$ then $A' (y, x)$.

5.) Graph the image of ABCD which is a reflection over the line $y=x$.

$$\begin{aligned} A(1,2) &\rightarrow A'(2,1) \\ B(3,5) &\rightarrow B'(5,3) \\ C(4,-3) &\rightarrow C'(-3,4) \\ D(2,-5) &\rightarrow D'(-5,2) \end{aligned}$$

