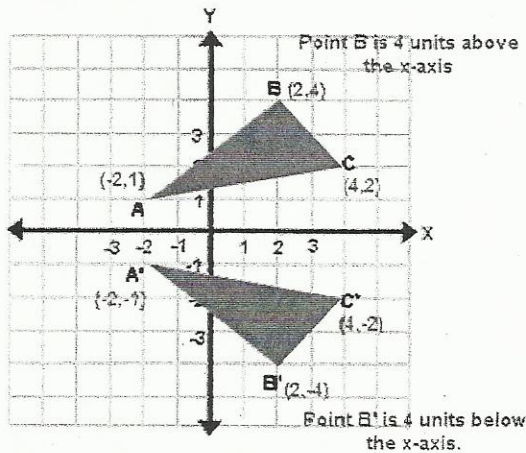


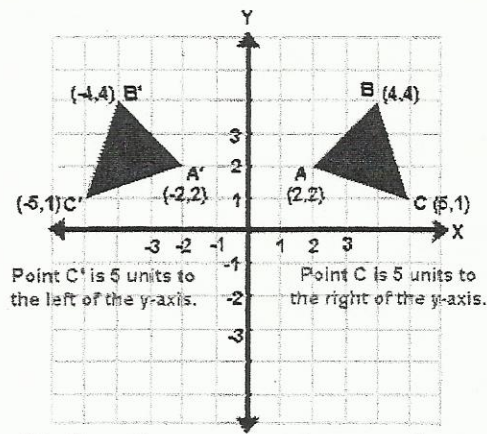
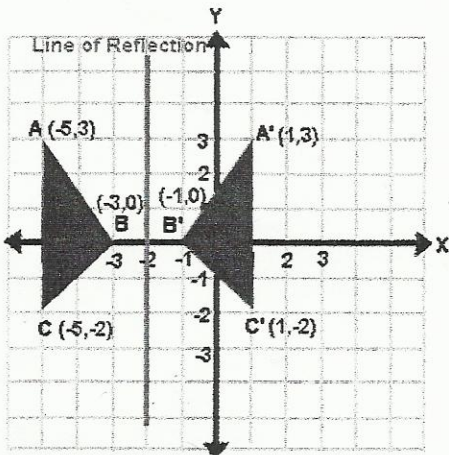
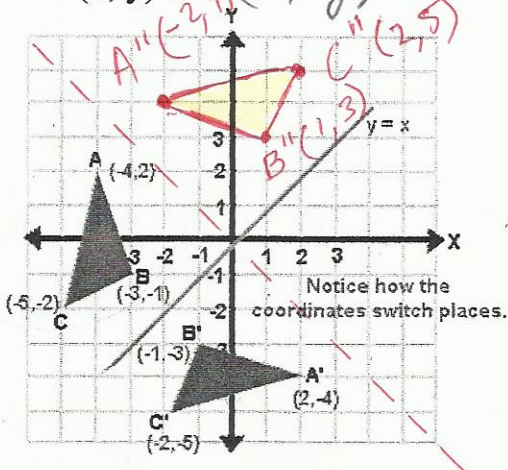
REFLECTIONS

A **reflection** over a line is a transformation in which each point of the original figure (pre-image) has an image that is the same distance from the line of reflection as the original point, but is on the opposite side of the line. A reflection is an isometry, because it preserves the size and shape of the pre-image.



Reflections over the x axis:

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



Reflections over the y axis:

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

Reflections over the line $y=x$

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

Reflections over the line $y=-x$

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

Reflections over any other line:

Each point of a reflected image is the same distance from the line of reflection as the corresponding point of the original figure. In other words, the line of reflection lies directly in the middle between the figure and its image -- it is the perpendicular bisector of the segment joining any point to its image. Keep this idea in mind when working with lines of reflections that are neither the x -axis nor the y -axis.