4.2 Notes (Day 1): Reflections **Name:** ______________________________ **Per:** ________

Reflection: A reflection is a transformation that uses a line like a mirror to reflect a figure.

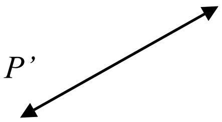
- ➔ The "mirror" is called the ________________________________

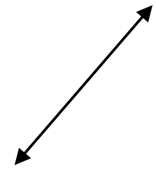
A reflection in a line *m* maps every point *P* in the plane to a point *P'*, so that for each point one of the following properties is true:

1. If *P* is NOT on line *m*, then *m* is the _______________________ of $\overline{PP'}$

   OR

2. If *p* is ON line *m*, then *P* = *P'*





Review of yesterday: Reflection across the x- and y-axis

1. When ΔABC is reflected across the y-axis, the ___-coordinates stayed the same and the ___-coordinates had the opposite signs

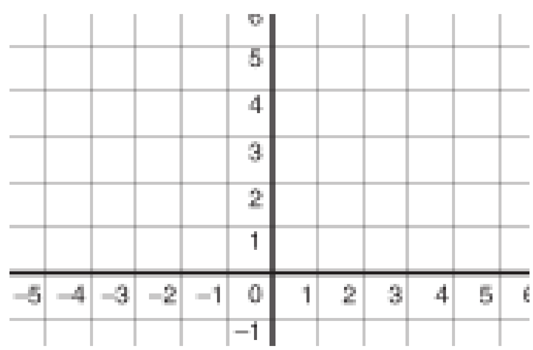
2. When ΔABC is reflected across the x-axis, the ___-coordinates stayed the same and the ___-coordinates had the opposite signs

From these observations, we can make the following rules:
If (x, y) is reflected in the y-axis, then its image is the point (_____ , _____)
If (x, y) is reflected in the x-axis, then its image is the point (_____ , _____)

Example:

1. The vertices of ΔJKL are J(1, 3), K(4, 4) and L(3, 1). Graph the image of ΔJKL after a reflection in the y-axis

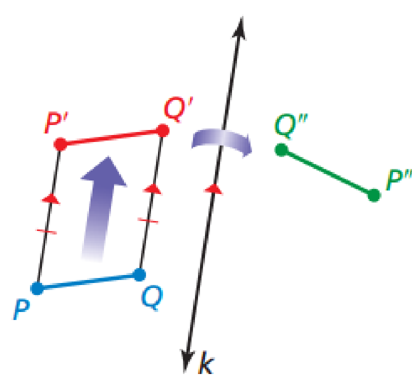
J' (____ , ____) K' (____ , ____) L' (____ , ____)



Glide Reflection: A glide reflection is a transformation involving a ______________ followed by a ____________ in which every point *P* is mapped to *P''* by the following steps:

1. First, a ________________ maps *P* to *P'*

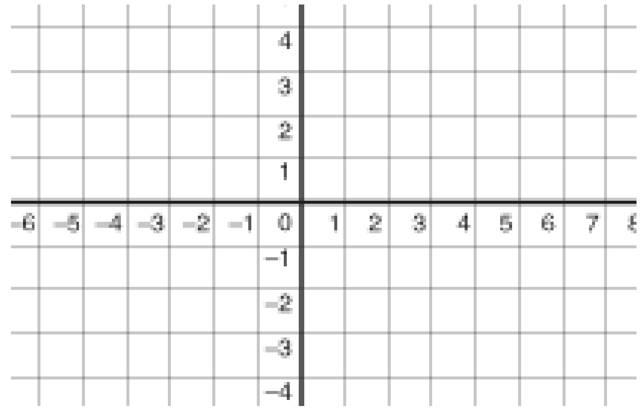
2. Then, a reflection in a line *k* parallel to the direction of the translation maps *P'* to *P''*



Example 2: Graph ΔABC with vertices A(3, 2), B(6, 3) and C(7, 1) and its image after the glide reflection.

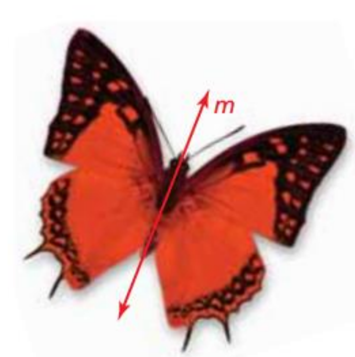
Translation: $(x, y) \rightarrow (x - 8, y)$

Reflection: in the x-axis



<u>Line Symmetry</u>: A figure in the plane has line symmetry when the figure can be mapped onto _________ by a reflection in a line.

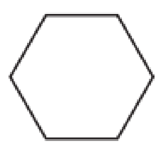
➔ The line of reflection is a ____________________________________,
such as line *m* here:



Example:

2. How many lines of symmetry does each hexagon have? Draw them in with a highlighter.

a. 

b. 

c.