

Transformation #2: Reflections (continued)

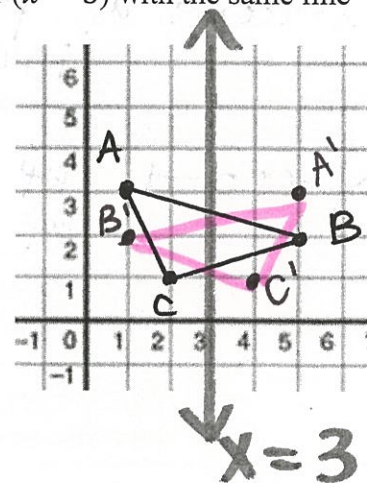
Lesson Objective

INBAT perform reflections across vertical + horiz. lines and the lines $y=x$ and $y=-x$

Reflecting in Horizontal and Vertical Lines

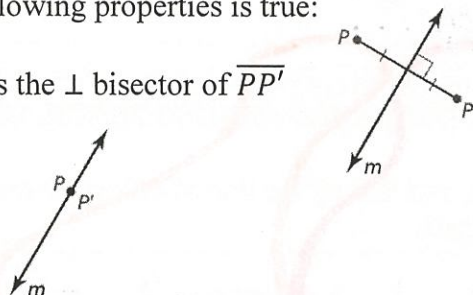
Examples:

1. Reflect $\triangle ABC$ in the line given below, using trace paper.
 - a. Use the trace paper Miss Gerling gave you (USE PENCIL ONLY!!!!) to trace $\triangle ABC$ and the line of reflection, $x = 3$
 - b. Flip the trace paper over, and line up the line of reflection on the trace paper ($x = 3$) with the same line on the notes sheet.
 - c. Plot the points for A' , B' , and C' on the coordinate plane.

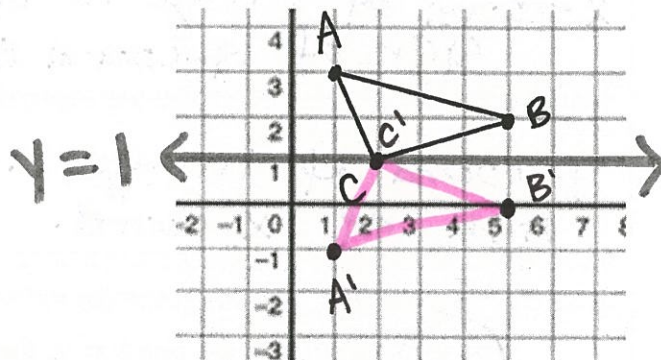


REMEMBER: A reflection in a line m maps every point P in the plane to a point P' , so that for each point one of the following properties is true:

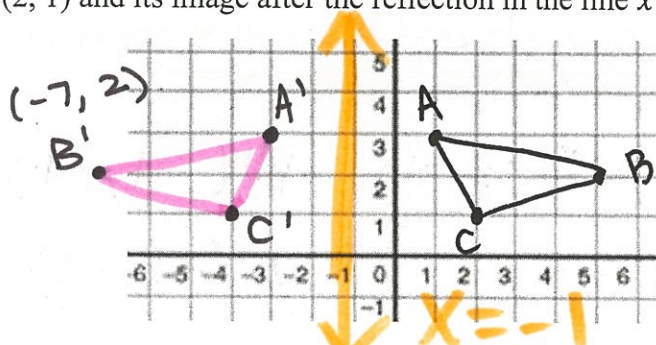
1. If P is NOT on line m , then m is the $\perp$ bisector of $\overline{PP'}$
- OR
2. If P is ON line m , then $P = P'$



2. Reflect $\triangle ABC$ in the line given below, using the properties of reflections in the box above.
 - a. Count how many units each point is away from the line of reflection.
 - b. Count that same amount of units on the *other side* of the line of reflection, then plot the image point



3. Graph $\triangle ABC$ with vertices $A(1, 3)$, $B(5, 2)$, and $C(2, 1)$ and its image after the reflection in the line $x = -1$



Reflecting Across the lines $y = x$ and $y = -x$

Examples

4. Graph $\overline{FG}$ with endpoints $F(-1, 2)$ and $G(1, 2)$ and its image after a reflection in the line $y = x$.
- Use the trace paper Miss Gerling gave you (USE PENCIL ONLY!!!!) to trace $\overline{FG}$ and the line of reflection, $y = x$.
 - Flip the trace paper over, and line up the line of reflection on the trace paper ($y = x$) with the same line on the notes sheet.

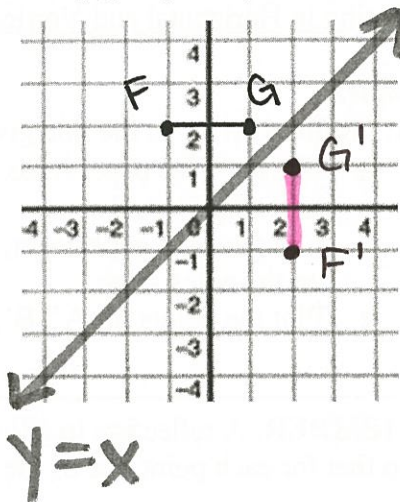
Where are F' and G' located? $F' (2, -1)$ and $G' (2, 1)$

What similarities/differences do you see between the x -coordinates of F and G vs. F' and G' ?

x -coord of preimage is y -coord of image ...

What similarities/differences do you see between the y -coordinates of F and G vs. F' and G' ?

y -coord. of preimage is x -coord. of image...



5. Graph $\overline{FG}$ with endpoints $F(-1, 2)$ and $G(1, 2)$ and its image after a reflection in the line $y = -x$.
- Use the trace paper Miss Gerling gave you (USE PENCIL ONLY!!!!) to trace $\overline{FG}$ and the line of reflection, $y = -x$.
 - Flip the trace paper over, and line up the line of reflection on the trace paper ($y = -x$) with the same line on the notes sheet.

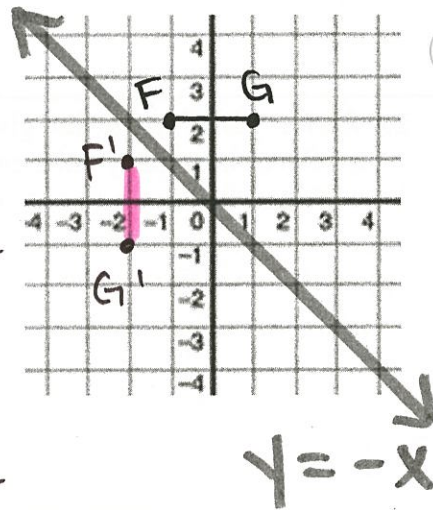
Where are F' and G' located? $F' (-2, 1)$ and $G' (-2, -1)$

What similarities/differences do you see between the x -coordinates of F and G vs. F' and G' ?

x -coord of image is ~~different~~ opposite sign of y -coord of preimage

What similarities/differences do you see between the y -coordinates of F and G vs. F' and G' ?

y -coord of image is opposite sign of x -coord. of preimage



From these observations, we can make the following rules:

If (x, y) is reflected in the line $y = x$, then its image is the point (y, x)

If (x, y) is reflected in the line $y = -x$, then its image is the point $(-y, -x)$

preimage

6. Graph $\triangle JKL$ with vertices at $J(1, 3)$, $K(4, 4)$ and $L(3, 1)$ and its image after a reflection in the line $y = -x$

$J'(-3, -1)$

$K'(-4, -4)$

$L'(-1, -3)$

