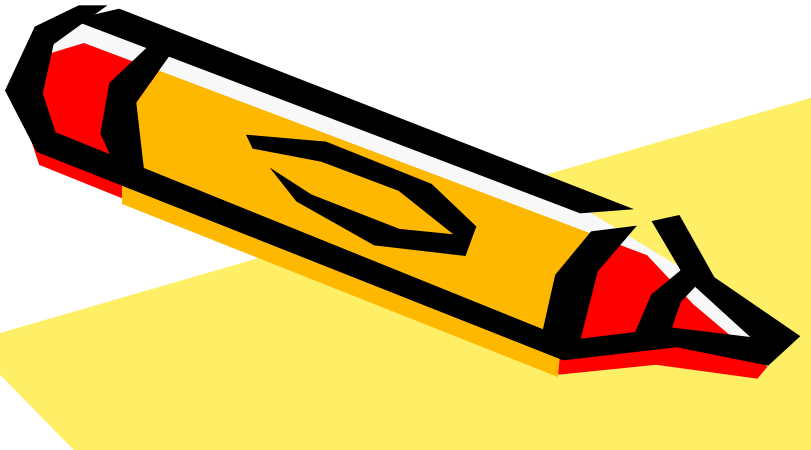
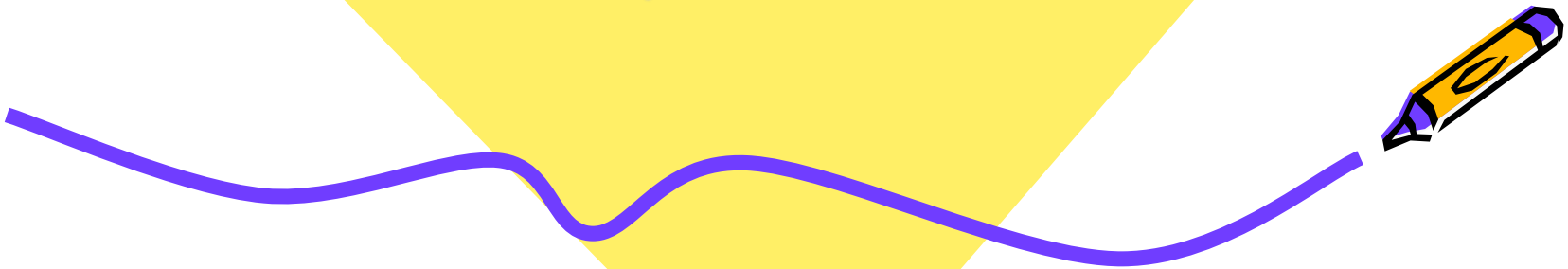


Geometry

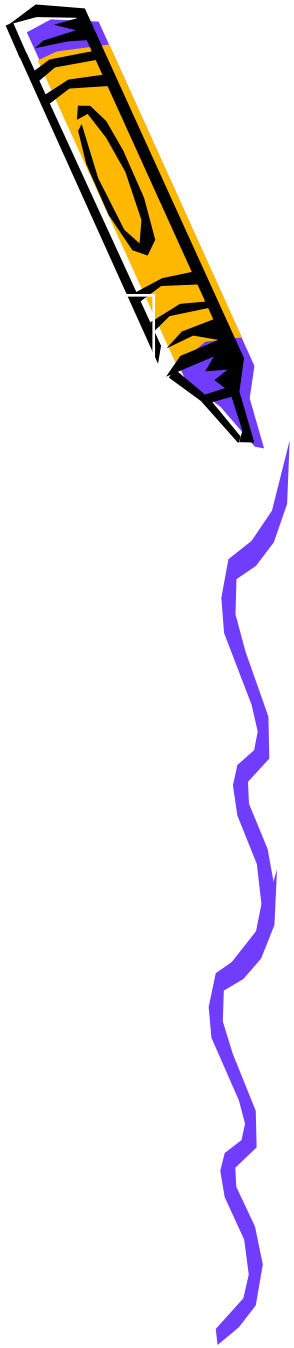
Reflections



Vocabulary

Reflection	Previously referred to as a 'flip'. Creates a mirror image about a specified line known as the line of reflection. The pre-image and the image are equidistant from the line of reflection.

Reflections



Basic Reflections

Reflect about (in) the x-axis: $(x, y) \rightarrow (x, -y)$
Reflect about (in) the y-axis: $(x, y) \rightarrow (-x, y)$

Reflection about any
horizontal line, y = # : $(x, y) \rightarrow (x, 2 * \# - y)$

Reflection about any
vertical line, x = # : $(x, y) \rightarrow (2 * \# - x, y)$

Reflect about the line y = x: $(x, y) \rightarrow (y, x)$
Reflect about the line y = - x: $(x, y) \rightarrow (-y, -x)$

Reflection

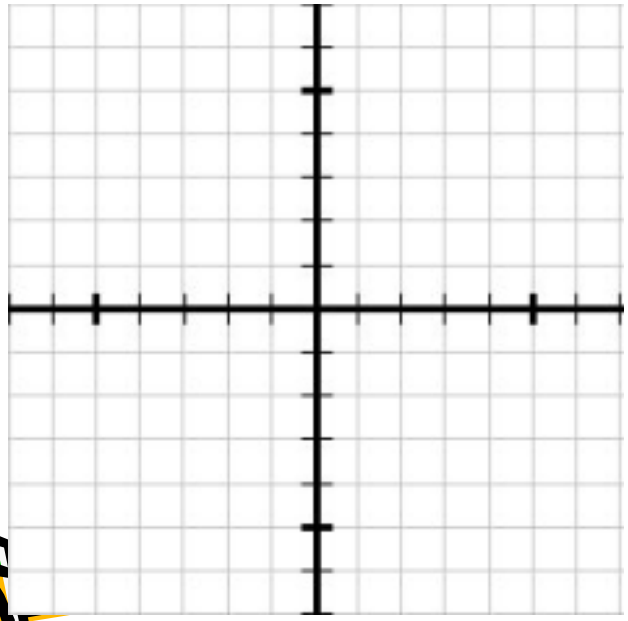
https://www.youtube.com/watch?v=ouNp8FtgiEE

Animated video about Reflections

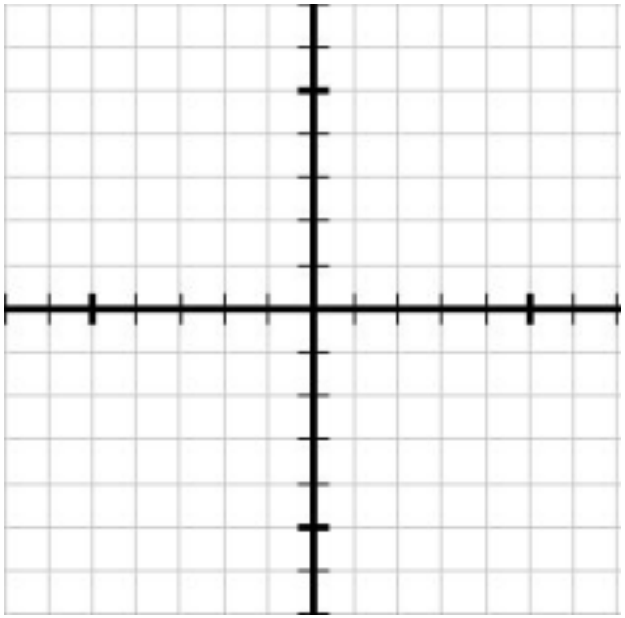
Reflections

Graph the polygon and its image after a reflection in the given line.

$A(-1, 5)$, $B(-4, 4)$, $C(-3, 1)$; y-axis



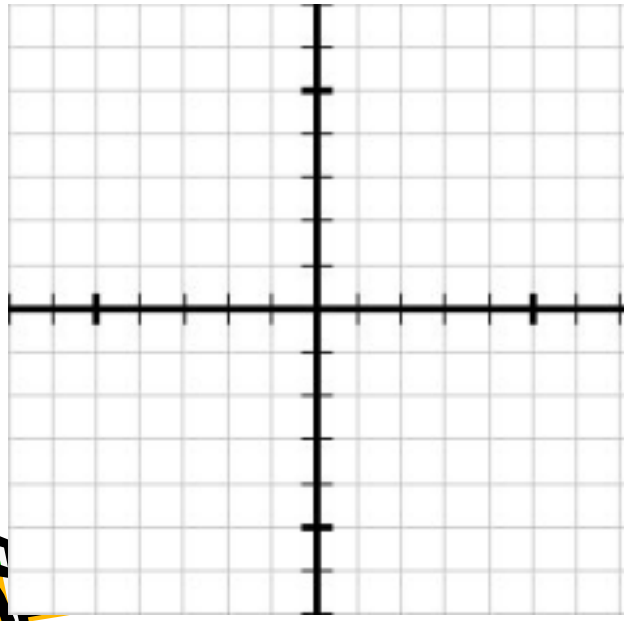
$A(0, 2)$, $B(4, 5)$, $C(5, 2)$; x-axis



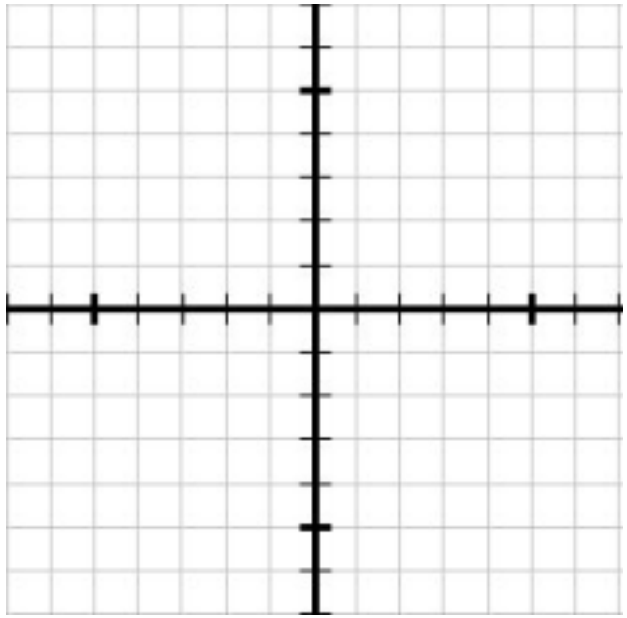
Reflections

Graph the polygon and its image after a reflection in the given line.

$A(2, -1), B(-4, -2), C(-1, -3); y = 1$



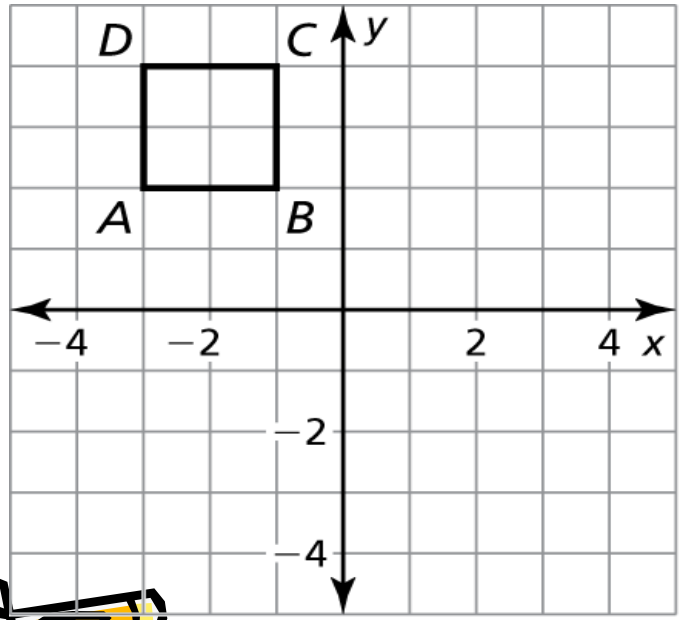
$A(-2, 3), B(-2, -2), C(0, -2); x = -3$



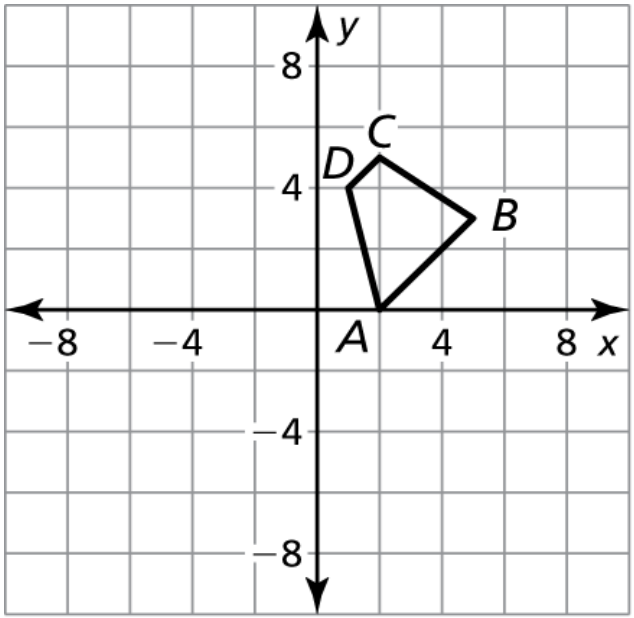
Reflections

Graph the polygon after a reflection in the given line.

$y = x$



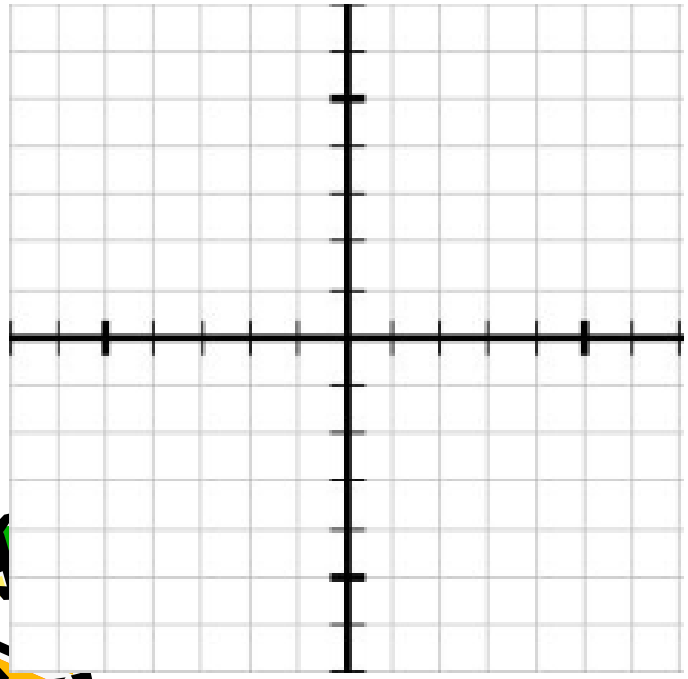
$y = -x$



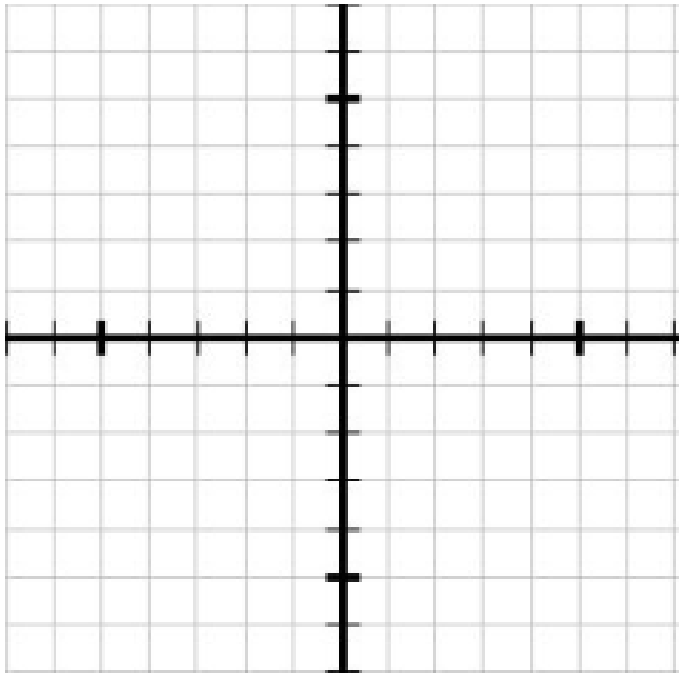
Reflections

Graph ΔJKL, J(3, 1), K(4, 2), L(1, 3) and the resulting image after each step of the given composition.

Translation: (x, y) → (x – 6, y – 1)
Reflection: in the line y = -x



Translation: (x, y) → (x, y – 4)
Reflection: in the line x = 1

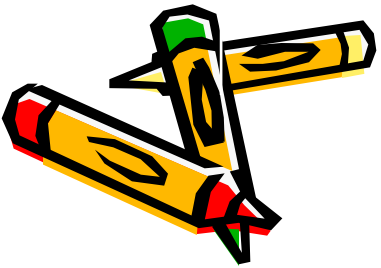


Reflections

Reflections over any line

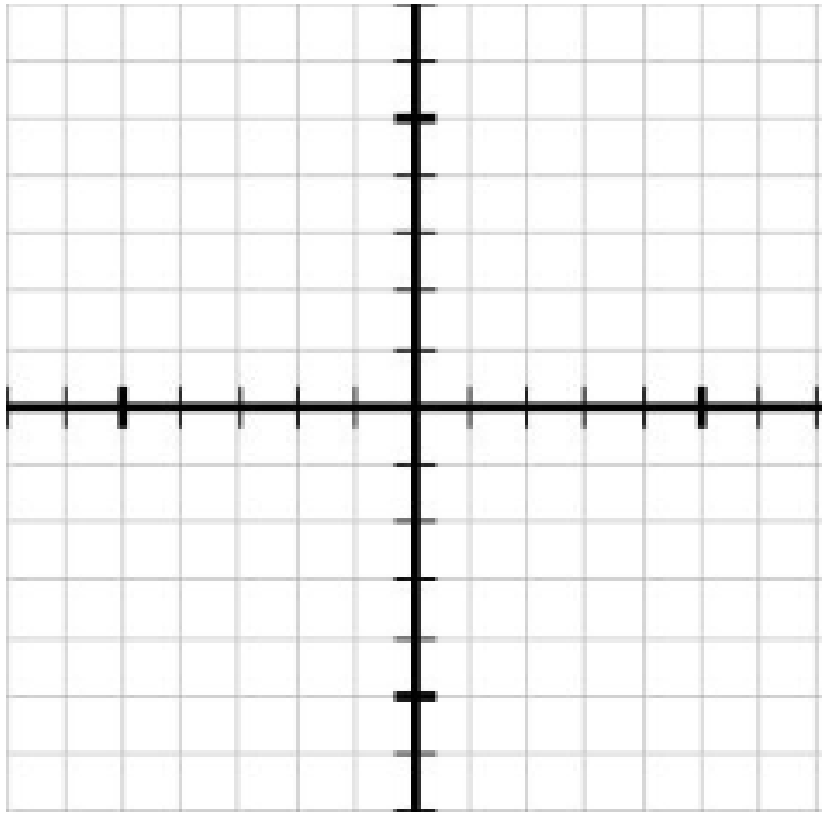
Reflect point P about line y = mx + b to find P′:

1. Determine the slope of the line of reflection
2. Determine the equation of the line perpendicular to the line of reflection, passing through P
3. Determine the point of intersection of the two lines
4. Determine the reflected point by applying midpoint calculations (the point of intersection is the midpoint of $\overline{PP'}$)



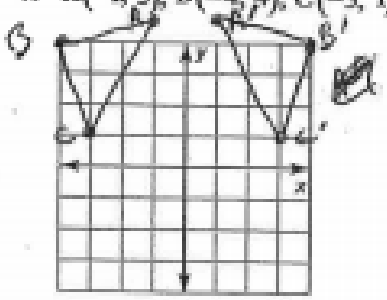
Reflections

Reflect the point A(5, 4) over the line $y = -\frac{1}{3}x + 3$

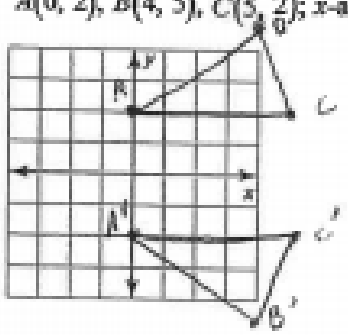


In Exercises 1–4, graph $\triangle ABC$ and its image after a reflection in the given line.

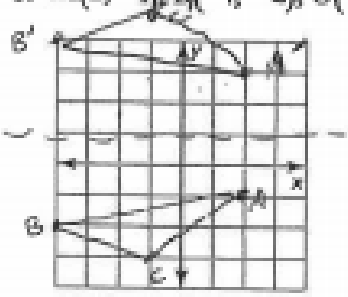
1. $A(-1, 5), B(-4, 4), C(-3, 1)$; y-axis



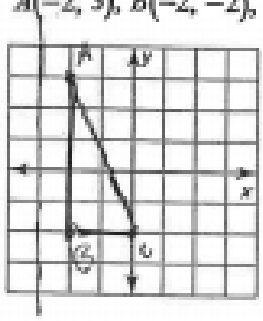
2. $A(0, 2), B(4, 5), C(5, 2)$; x-axis



3. $A(2, -1), B(-4, -2), C(-1, -3)$; $y = 1$



4. $A(-2, 3), B(-2, -2), C(0, -2)$; $x = -3$



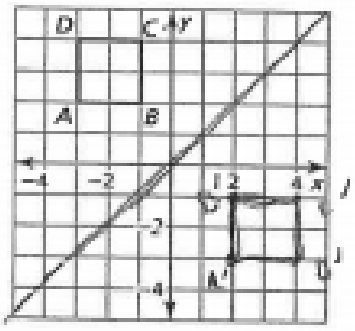
$A'(-4, 3)$

$B'(-4, -2)$

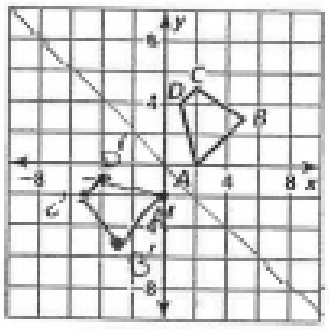
$C'(-6, -2)$

In Exercises 5 and 6, graph the polygon's image after a reflection in the given line.

5. $y = x$



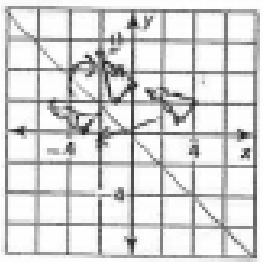
6. $y = -x$



In Exercises 7 and 8, graph $\triangle JKL$ with vertices $J(3, 1)$, $K(4, 2)$, and $L(1, 3)$ and its image after the glide reflection.

7. Translation: $(x, y) \rightarrow (x - 6, y - 1)$

   Reflection: in the line $y = -x$



8. Translation: $(x, y) \rightarrow (x, y - 4)$

   Reflection: in the line $x = 1$