

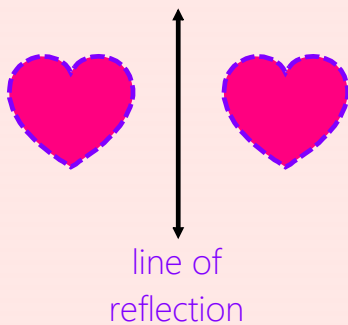
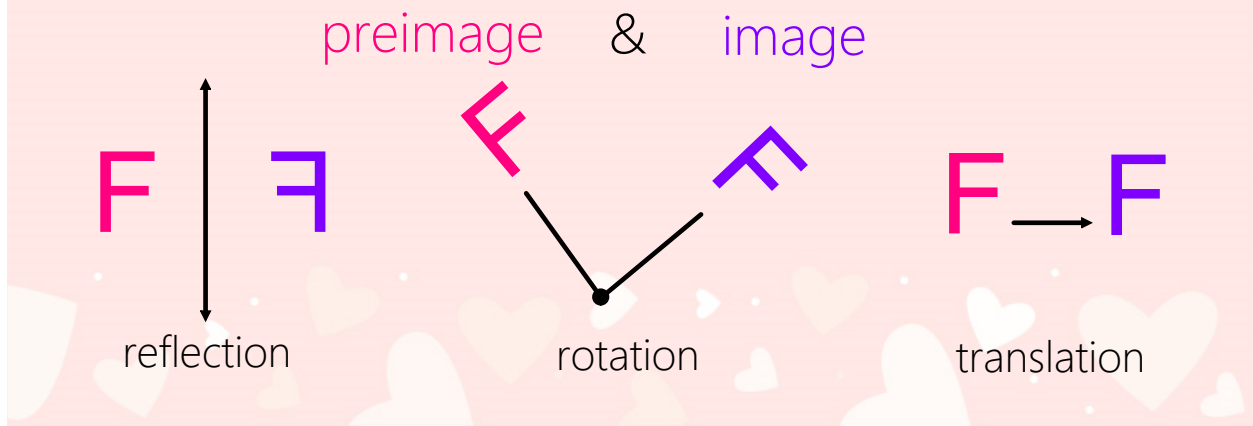
## 9.3 Rigid Motion & Reflections

rigid transformations - transformations that do not alter the size or shape of a figure (ex: rotations, reflections, translations)

preimage - the original figure/image

image - the new figure/image

isometry - a transformation that preserves lengths (also preserves angle measures, parallel lines, & distance between points)

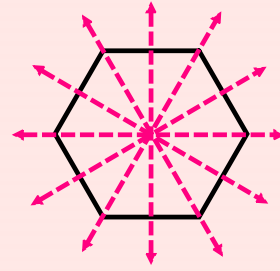
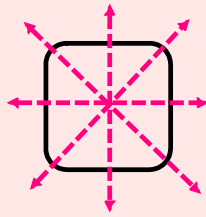
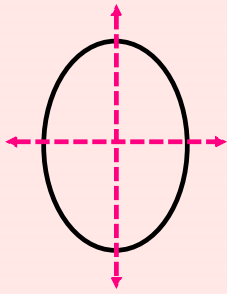


A line of reflection acts like a mirror, with an image reflected over the line.

### Theorem 9.2: Reflection Theorem

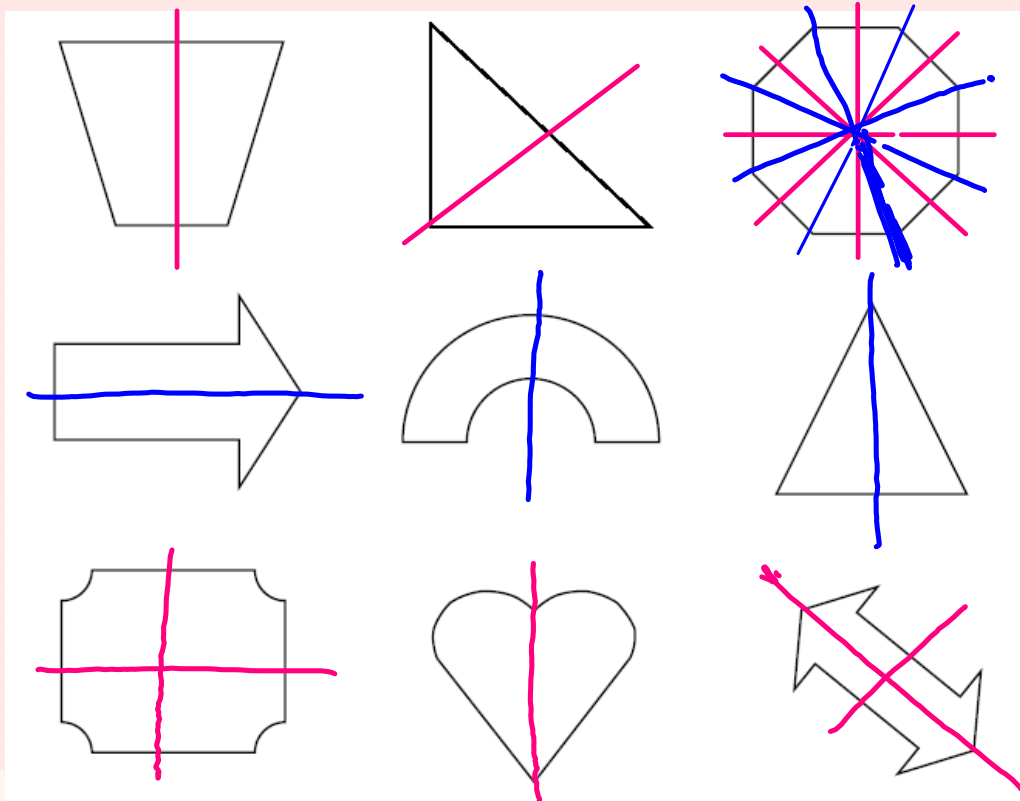
A reflection is an isometry.

A figure has a line of symmetry if the figure can be mapped onto itself by a reflection over the line.



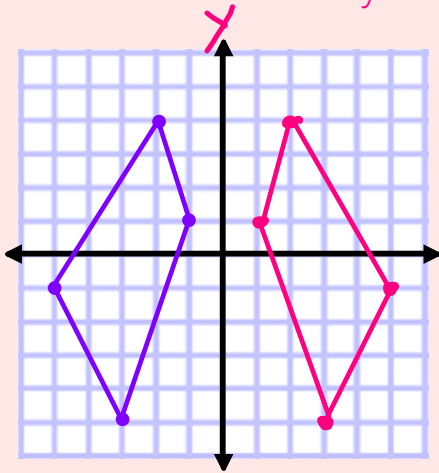
Draw a line of symmetry on each figure.

Remember that some figures may have more than one!

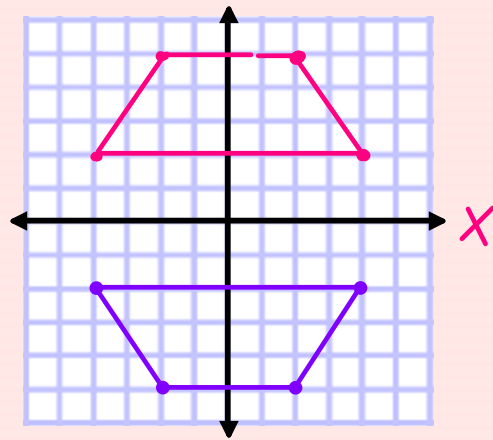


Graph the image of the figure using the transformation given.

Reflection across the  $y$ -axis

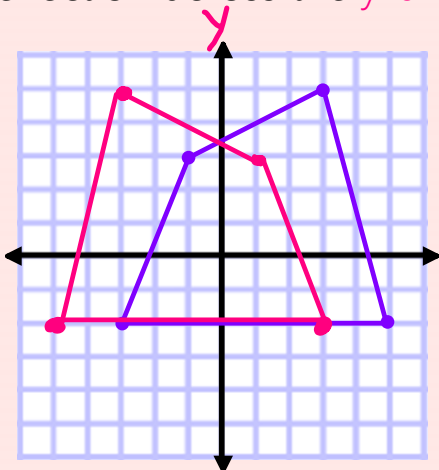


Reflection across the  $x$ -axis

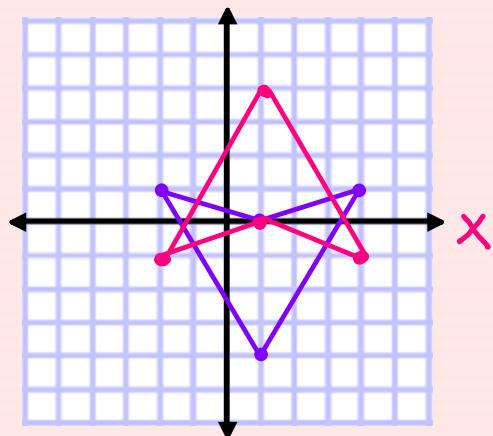


Graph the image of the figure using the transformation given.

Reflection across the  $y$ -axis



Reflection across the  $x$ -axis



Graph the image of the figure using the transformation given.

$$y = mx + b$$

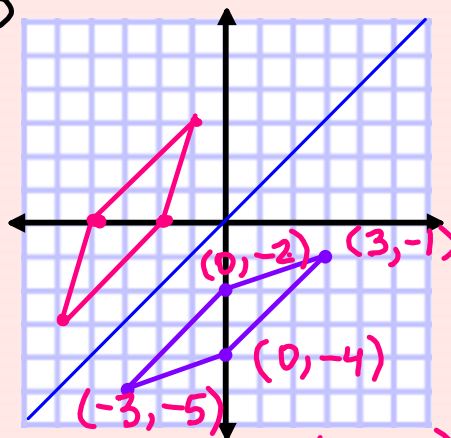
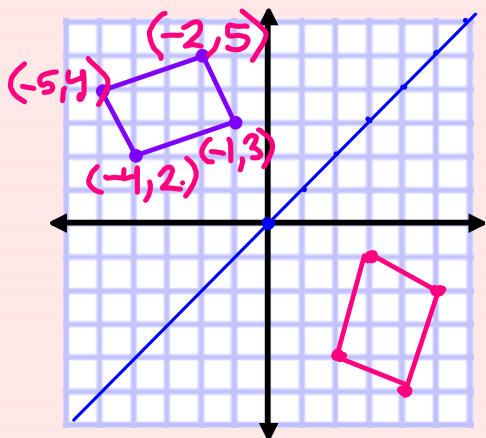
$$y = x + 0$$

$$m = \frac{1}{1}$$

$$y\text{-int} = 0$$

Reflection across  $y = x$

Reflection across  $y = x$



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

$(2, -4)$	$(5, -2)$
$(4, -5)$	$(3, -1)$

$(-1, 3)$	$(-5, -3)$
$(-4, 0)$	$(-2, 0)$

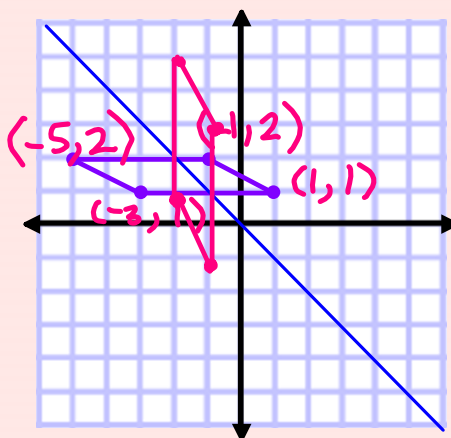
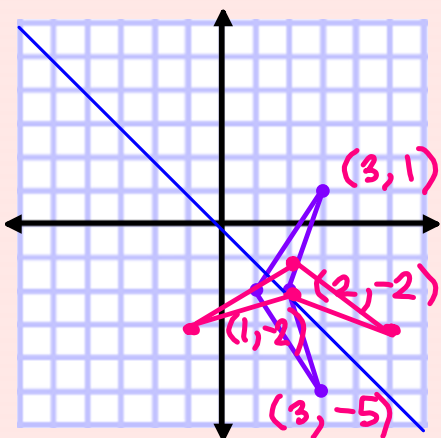
Graph the image of the figure using the transformation given.

$$y\text{-int} = 0$$

$$m = -\frac{1}{1}$$

Reflection across  $y = -x$

Reflection across  $y = -x$



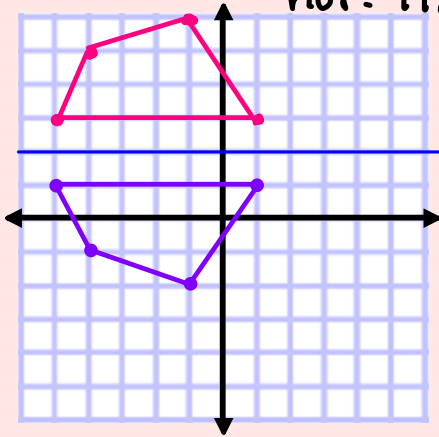
$$(x, y) \rightarrow (-y, -x)$$

$(-1, -3)$	$(5, -3)$
$(2, -2)$	$(2, -1)$

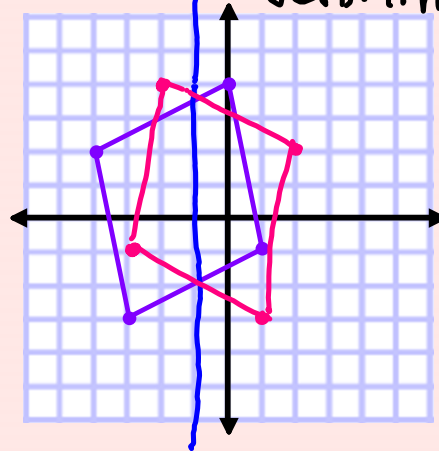
$(-1, -1)$	$(-2, 5)$
$(-2, 1)$	$(-1, 3)$

$x = \#$  vertical       $y = \#$  horizontal  
 Graph the image of the figure using the transformation given.

Reflection across  $y = 2$   
 hor. line

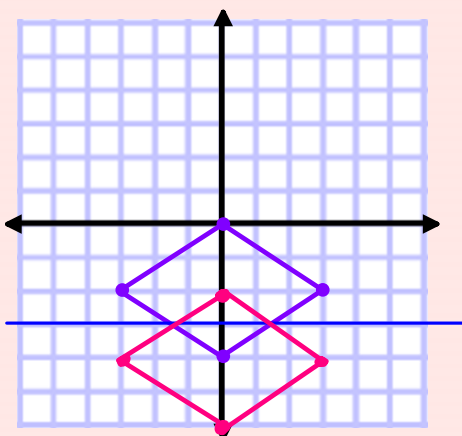


Reflection across  $x = -1$   
 verb. line



Graph the image of the figure using the transformation given.

Reflection across  $y = -3$



Reflection across  $x = 1$

