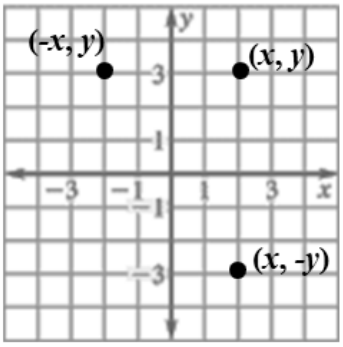
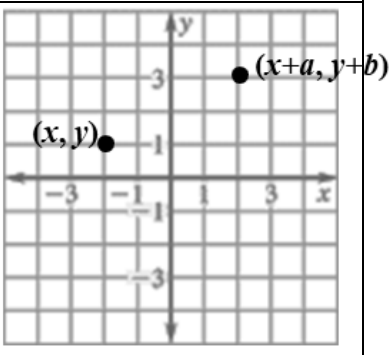
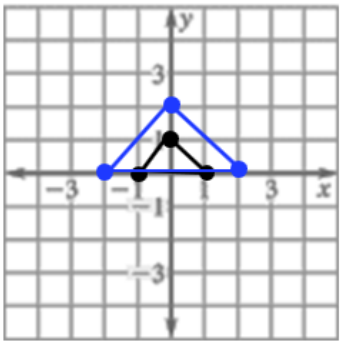
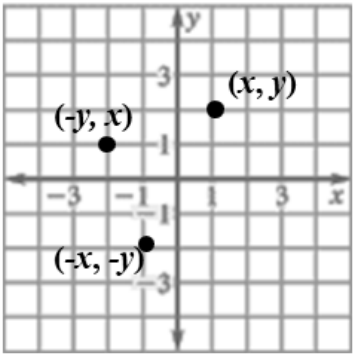
Transformations in the Coordinate Plane

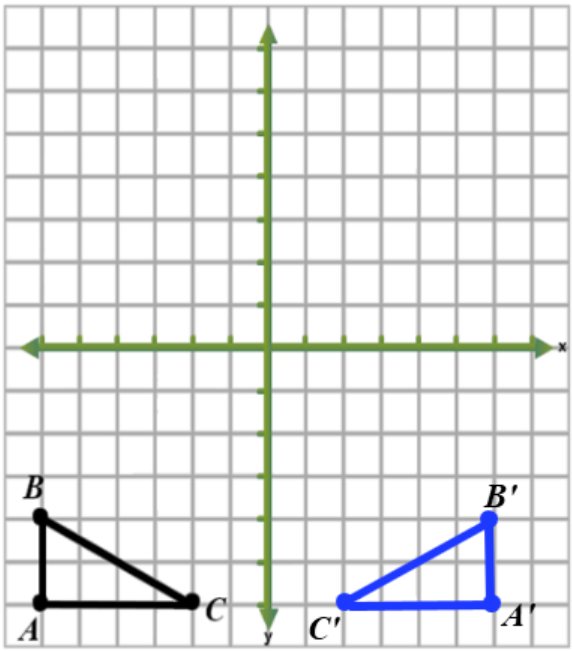
Goals: *Reflect figures in the coordinate plane across various lines
*Translate figures in the coordinate plane
*Rotate figures around a point by 90° and 180°
*Dilate figures in the coordinate plane by scale factors

Transformations: Movements of geometric figures in the coordinate plane. If a figure has points labeled *A*, *B* and *C*, then the points after the transformation would be labeled *A'*, *B'* and *C'*.

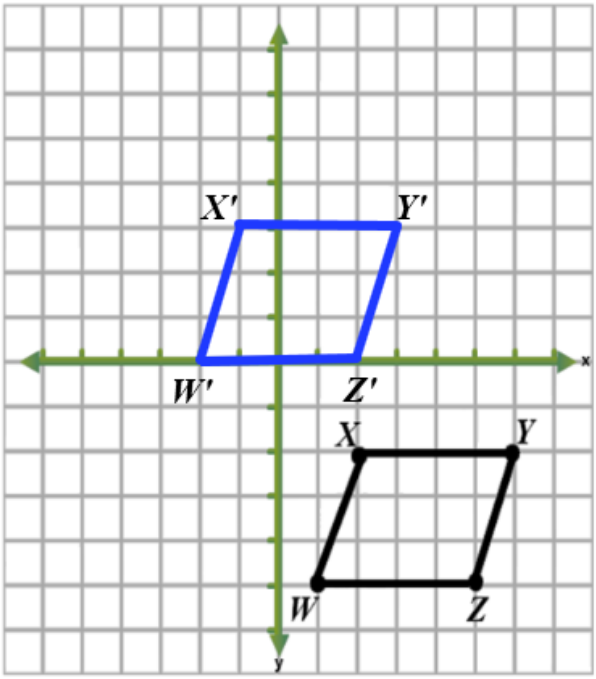
TRANSFORMATIONS			
Type	**Explanation**	**Symbols**	**Picture**
Reflection	A figure flipped over a line.	Reflect over x-axis: $(x, y) \Rightarrow (x, -y)$ Reflect over y-axis: $(x, y) \Rightarrow (-x, y)$	
Translation	A figure slid in any direction.	$(x, y) \Rightarrow (x + a, y + b)$	
Dilation	A figure enlarged or reduced If $k > 1$ the figure is enlarged. If $0 < k < 1$, the figure is reduced	$(x, y) \Rightarrow (kx, ky)$	
Rotation	A figure turned around a point (typically the origin)	90° counterclockwise: $(x, y) \Rightarrow (-y, x)$ 180° rotation: $(x, y) \Rightarrow (-x, -y)$	

Perform the transformation indicated.

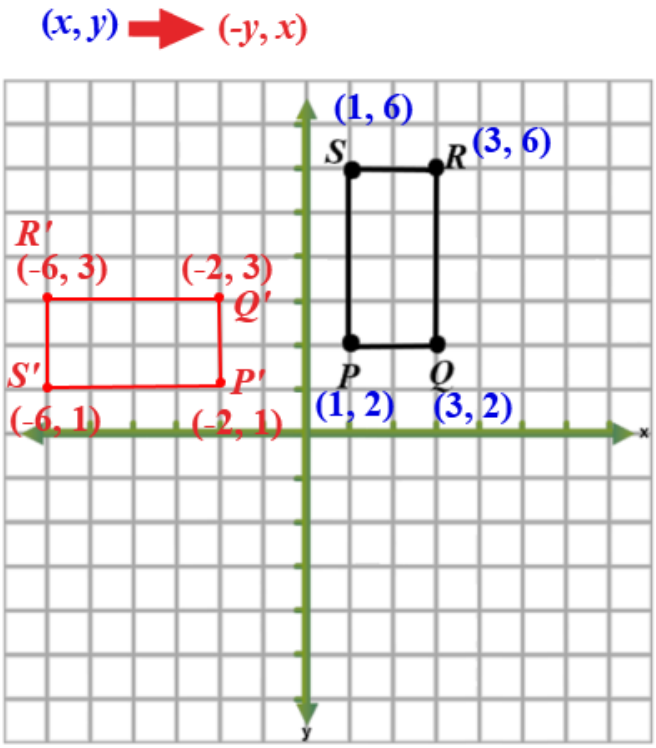
Ex: Reflect Δ*ABC* over the *x*-axis.



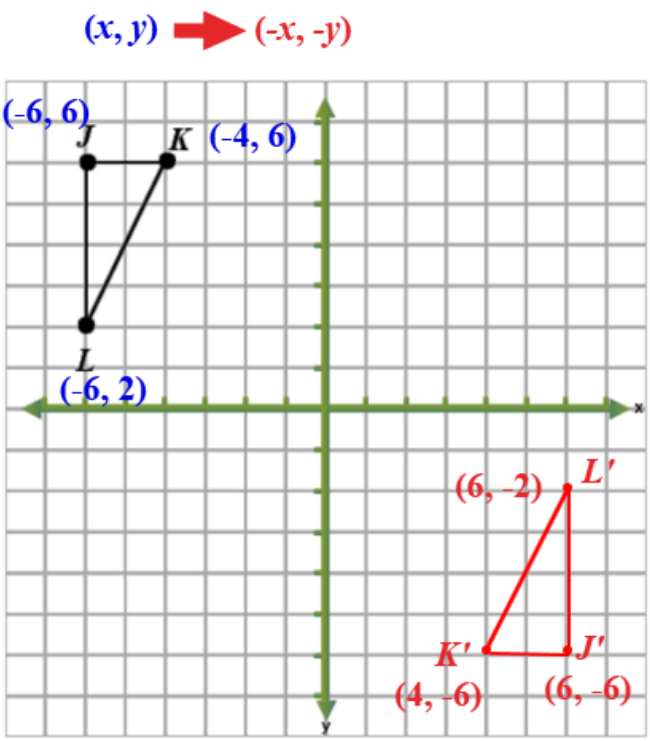
Ex: Translate parallelogram *WXYZ* 5 units up and 3 units left



Ex: Rotate rectangle *PQRS* by 90° *counterclockwise* about the origin

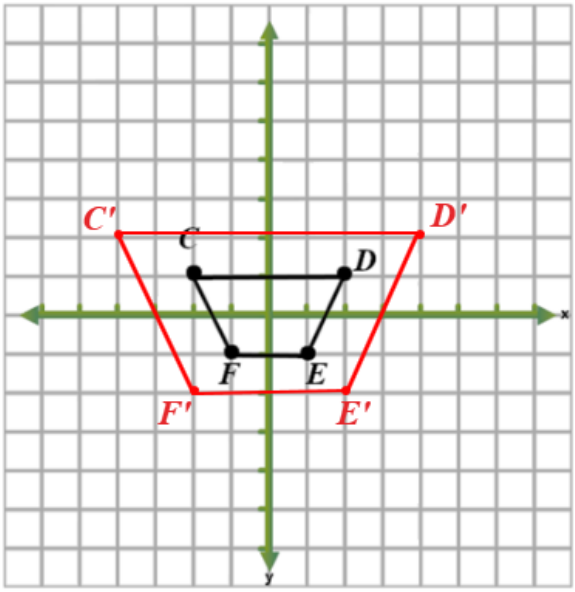


Ex: Rotate Δ*JKL* 180° about the origin



Ex: Dilate trapezoid *CDEF* by a scale factor of 2.

$(x, y) \rightarrow (2x, 2y)$



Ex: Reflect pentagon *RSTUV* across the line $x = -1$

*make sure each point is the same distance from the line of reflection