

Algebraic Rules for Transformations

Translation

$$(x, y) \rightarrow (x+a, y+b)$$

+a right
-a left

+b up
-b down

Reflection

over x-axis: $(x, y) \rightarrow (x, -y)$

over y-axis: $(x, y) \rightarrow (-x, y)$

over the line $y=x$: $(x, y) \rightarrow (y, x)$

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

Rotations

90° counter clockwise: $(x, y) \rightarrow (-y, x)$

180° : $(x, y) \rightarrow (-x, -y)$

270° counter clockwise: $(x, y) \rightarrow (y, -x)$

-or-

90° clockwise