**Transformation Rules**

**Line Reflections**

 Reflect over x-axis

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

Reflect over y-axis

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

Reflect over $y=x$

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

Reflect over $y=-x$

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

**Rotations**

 $90° Rotation $

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

$$180° Rotation $$

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

$$270° Rotation $$

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

$$90° Counterclockwise Rotation $$

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

**Translation**

Horizontal shift of a, Vertical shift of b

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