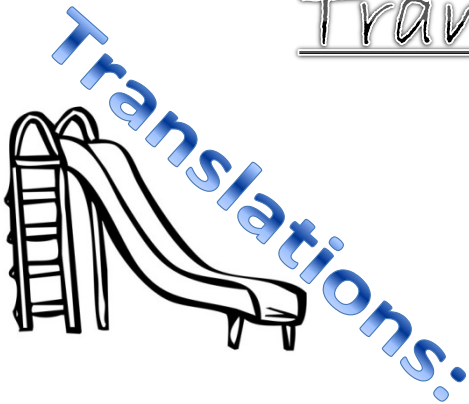


# Transformation Rules



$$T_{a,b}(x, y) \rightarrow (x \pm a, y \pm b)$$

## Reflections: Reflections

### Reflections Over a Line:

$$r_{x\text{-axis}}(x, y) \rightarrow (x, -y)$$

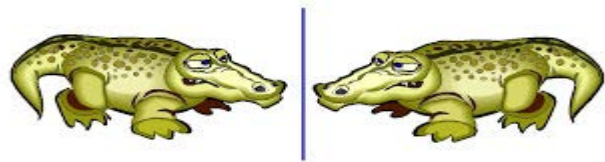
$$r_{y\text{-axis}}(x, y) \rightarrow (-x, y)$$

$$r_{y=x}(x, y) \rightarrow (y, x)$$

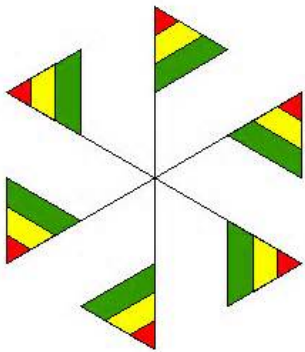
$$r_{y=-x}(x, y) \rightarrow (-y, -x)$$

### Reflections Over the Origin:

$$R_{180^\circ}(x, y) \rightarrow (-x, -y)$$



## Rotations



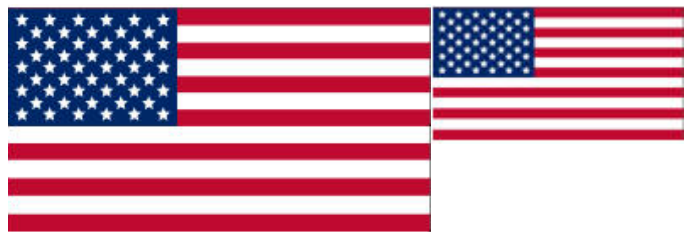
$$R_{90^\circ}(x, y) \rightarrow (-y, x) \quad R_{180^\circ}(x, y) \rightarrow (-x, -y)$$

$$R_{270^\circ}(x, y) \rightarrow (y, -x)$$

$$R_{-90^\circ}(x, y) \rightarrow (y, -x)$$

## Dilations

$$D_k(x, y) \rightarrow (kx, ky) \text{ when } 0 < |k| < 1$$



$$D_k(x, y) \rightarrow (kx, ky) \text{ when } 1 < |k| < \infty$$