**SAT PREP**

| Transformation Rules | | |
|---|---|---|
| **Function Notation** | **Type of Transformation** | **Change to Coordinate Point** |
| f(x) + d | Vertical translation up d units | $(x, y) \rightarrow (x, y+d)$ |
| f(x) - d | Vertical translation down d units | $(x, y) \rightarrow (x, y-d)$ |
| f(x + c) | Horizontal translation left c units | $(x, y) \rightarrow (x-c, y)$ |
| f(x - c) | Horizontal translation right c units | $(x, y) \rightarrow (x+c, y)$ |
| -f(x) | Reflection over x-axis | $(x, y) \rightarrow (x, -y)$ |
| f(-x) | Reflection over y-axis | $(x, y) \rightarrow (-x, y)$ |
| af(x) | Vertical stretch for $\|a\| > 0$ | $(x, y) \rightarrow (x, ay)$ |
| af(x) | Vertical compression for $0 < \|a\| < 1$ | $(x, y) \rightarrow (x, ay)$ |
| f(bx) | Horizontal compression for $\|b\| > 0$ | $(x, y) \rightarrow \left(\frac{x}{b}, y\right)$ |
| f(bx) | Horizontal stretch for $0 < \|b\| < 1$ | $(x, y) \rightarrow \left(\frac{x}{b}, y\right)$ |