

# Transformation Notes

$$a \cdot f\left(\frac{x}{b} - h\right) + k$$

## vertical dilation (a)

- $a > 1$  makes the graph taller, V.D. BAFO  $a$
- $0 < a < 1$  (its a fraction) makes the graph wider, a V.D. BAFO  $a$
- $a$  is negative, graph reflects over  $x$ -axis ( $-f(x)$ )

## horizontal dilation (b)

- $b > 1$  makes graph wider, ex.  $f\left(\frac{x}{3}\right)$  H.D. BAFO 3
- $0 < b < 1$  makes graph taller, ex  $f(3x)$  H.D. BAFO  $\frac{1}{3}$
- $b$  is negative, graph reflects over  $y$ -axis ( $f(-x)$ )

## horizontal movement (h)

- $h > 0$  so  $(x-h)$  the graph moves to the right
- $h < 0$  so  $(x+h)$  the graph moves to the left

## vertical movement (k)

- $k > 0$  the graph moves up
- $k < 0$  the graph moves down