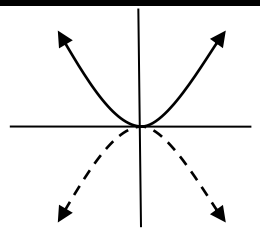
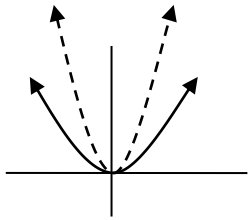
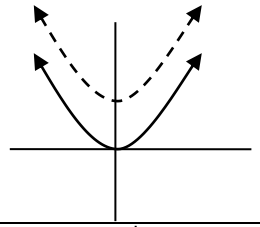
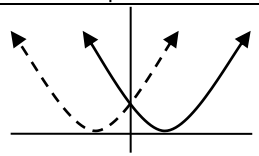
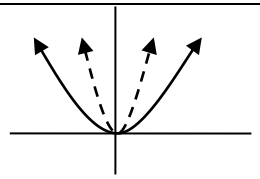
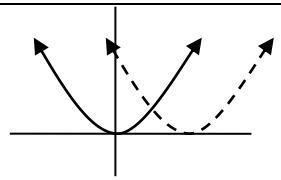
Transformation	Evidence	Example	Graph	Description
Vertical reflection	**Multiplication** of the **y-value by a <u>negative</u>**	$y = -x^2$		Reflection (flip) about the x-axis.
Vertical stretch or compression (shrink) **Also called a "dilation"**	**Multiplication** or **division** of the **y-value**.	$y = 2x^2$		Stretch vertically or compress vertically by the given factor. Note that a factor > 1 <u>stretches</u>, while a factor < 1 <u>compresses</u>.
Vertical move up or down **Also called a "translation" or "shift"**	**Addition** or **subtraction** to the **y-value**.	$y = x^2 + 5$		Move up or down by the given value. Note that the direction <u>matches</u> the value added (i.e., + 5 moves up 5; –5 moves down 5).
Horizontal reflection	**Multiplication** of the **x-value by a <u>negative</u>**	$y = (-x - 1)^2$		Reflection (flip) about the y-axis. Note: $y = (x - 1)^2$ is the reference function, so that the horizontal reflection can be observed.
Horizontal stretch or compression (shrink) **Also called a "dilation"**	**Multiplication** or **division** directly of the **x-value**.	$y = (2x)^2$		Stretch horizontally or compress horizontally by the given factor. Note that a factor > 1 <u>compresses</u>, while a factor < 1 <u>stretches</u>.
Horizontal move right or left **Also called a "translation" or "shift"**	**Addition** or **subtraction** directly to the **x-value**.	$y = (x - 5)^2$		Move right or left by the given value. Note that the direction is <u>opposite</u> the value added to x (i.e., x + 5 moves left 5; x – 5 moves right 5).