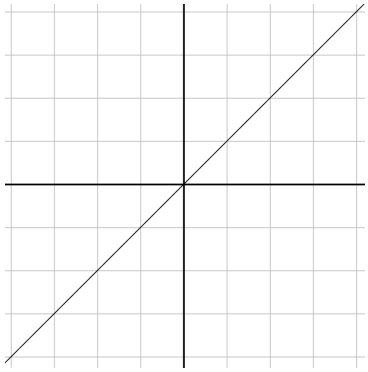
$$a\,f(bx \pm c) \pm d$$

SHIFTS			
Vertical	*Description*	*Coordinate:* (x, y)	$f(x)$ *transformation*
$f(x)+d$	Add d to each y-coordinate of $f(x)$	$(x, y+d)$	Shifts the graph up $\uparrow$ d units.
$f(x)-d$	Subtract d from each y-coordinate of $f(x)$	$(x, y-d)$	Shifts the graph down $\downarrow$ d units.
Horizontal	*Description*	*Coordinate:* (x, y)	$f(x)$ *transformation*
$f(x+c)$	Subtract c from each x-coordinate of $f(x)$	$(x-c, y)$	Shifts the graph left $\leftarrow$ c units.
$f(x-c)$	Add c to each x-coordinate of $f(x)$	$(x+c, y)$	Shifts the graph right $\rightarrow$ c units.

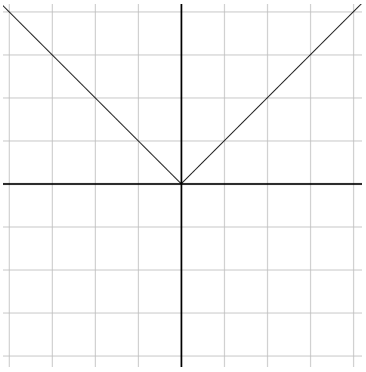
STRETCHES AND COMPRESSIONS			
Vertical	*Coordinate points* (x, y)	*Coordinate:* (x, y)	$f(x)$ *transformation*
$a\,f(x)$ $a>1$	Multiply each y-coordinate of $f(x)$ by a.	(x, ay)	Stretches the graph vertically by a factor of a.
$a\,f(x)$ $0<a<1$	Multiply each y-coordinate of $f(x)$ by a	(x, ay)	Compresses the graph vertically by a factor of a.
Horizontal	*Coordinate points* (x, y)	*Coordinate:* (x, y)	$f(x)$ *transformation*
$f(bx)$ $b>1$	Multiply each x-coordinate of $f(x)$ by $\frac{1}{b}$.	$\left(\frac{1}{b}x, y\right)$	Compresses the graph horizontally by a factor of $\frac{1}{b}$.
$f(bx)$ $0<b<1$	Multiply each x-coordinate of $f(x)$ by $\frac{1}{b}$.	$\left(\frac{1}{b}x, y\right)$	Stretches the graph horizontally by a factor of $\frac{1}{b}$.

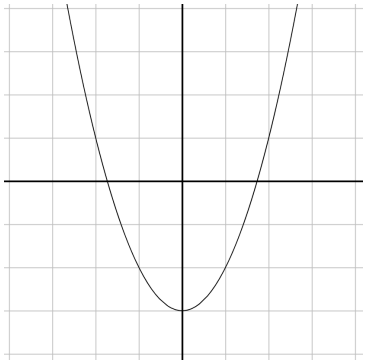
REFLECTIONS			
	Coordinate points (x, y)	*Coordinate:* (x, y)	$f(x)$ *transformation*
$-f(x)$	Multiply each y-coordinate of $f(x)$ by -1.	$(x, -y)$	Reflects the graph about the x-axis.
$f(-x)$	Multiply each x-coordinate of $f(x)$ by -1.	$(-x, y)$	Reflects the graph about the y-axis.

ABSOLUTE VALUE			
	Coordinate points (x, y)	*Coordinate:* (x, y)	$f(x)$ *transformation*
$\lvert f(x)\rvert$	All points that have a negative y-coordinate switch to become a positive number. The x-coordinates are not affected.	$(x, \lvert y\rvert)$	All points below x-axis are reflected about the x-axis.
$f(\lvert x\rvert)$	All points with a negative x-coordinate swaps its y-coordinate value with that of its positive counterpart.	$(x^-, y^-) \rightarrow (x^-, y^+)$	All points to the right of the y-axis get reflected about the y-axis overwriting all points to the left of the y-axis.

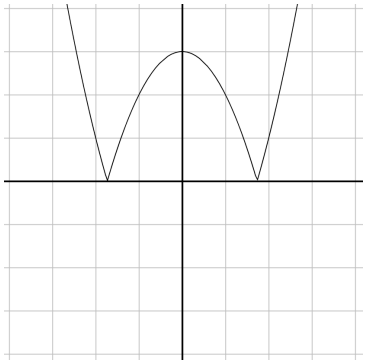


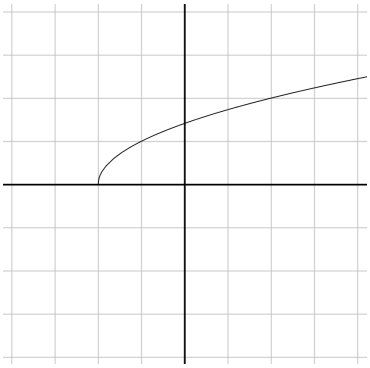
$\left|f(x)\right|$



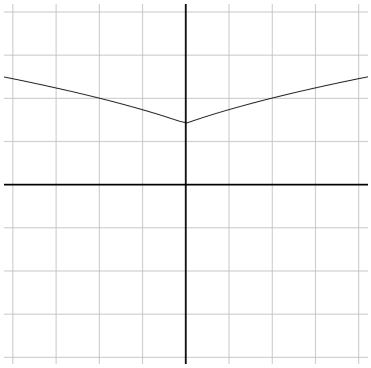


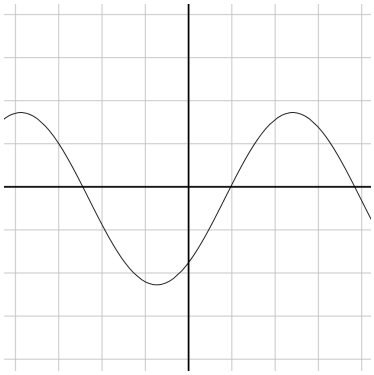
$\left|f(x)\right|$





$f\left(\left|x\right|\right)$





$f\left(\left|x\right|\right)$