

Ways to build a function $g(x)$ by transforming $f(x)$:

We want to build the graph of $g(x)$ by:	We build the function $g(x)$ by:	If the point (x, y) is on the graph of f , then the point ----- is on the graph of g
shifting $f(x)$ up k units	adding k to every output	$(x, y + k)$
shifting $f(x)$ down k units	subtracting k from every output	$(x, y - k)$
shifting $f(x)$ right k units	subtracting k from the input	$(x + k, y)$
shifting $f(x)$ left k units	adding k to the input	$(x - k, y)$
stretching $f(x)$ vertically by a factor of $k > 1$	multiplying the outputs by k	(x, ky)
compressing $f(x)$ vertically by a factor of $k > 1$	dividing the outputs by k	$(x, \frac{y}{k})$
stretching $f(x)$ horizontally by a factor of $k > 1$	dividing the inputs by k	(kx, y)
compressing $f(x)$ horizontally by a factor of $k > 1$	multiplying the inputs by k	$(\frac{x}{k}, y)$
reflecting $f(x)$ over the x -axis	multiplying the outputs by -1	$(x, -y)$
reflecting $f(x)$ over the y -axis	multiplying the inputs by -1	$(-x, y)$