

Example 2 For each function $f(x)$, determine the equation for $g(x)$.

a) $f(x) = \sqrt{x-3} + 2$ $g(x) = -f(x)$

$$g(x) = -(\sqrt{x-3} + 2)$$

$$g(x) = -\sqrt{x-3} - 2$$

b) $f(x) = \frac{1}{x-2}$ $g(x) = f(-x)$

$$g(x) = \frac{1}{-x-2} = \frac{-1}{x+2}$$

c) $f(x) = (x-3)^2 + 1$ $g(x) = -f(-x)$

$$g(x) = -[(x-3)^2 + 1] = -[(-x-3)^2 + 1] = -[-1(x+3)^2 + 1]$$

$$g(x) = (x+3)^2 - 1$$

d) $f(x) = (x-1)^2 - 1$ $g(x) = -f(x)$

$$g(x) = -[(x-1)^2 - 1]$$

$$= -(x-1)^2 + 1$$

Come back on Monday

e) $f(x) = \sqrt{x+4} - 2$ $g(x) = f(-x)$

$$g(x) = \sqrt{-x+4} - 2$$

$$g(x) = \sqrt{-(x-4)} - 2$$

f) $f(x) = \frac{1}{x+1} + 4$ $g(x) = -f(-x)$

$$g(x) = -1\left(\frac{1}{-x+1} + 4\right)$$

$$= \frac{-1}{-x+1} - 4$$

$$g(x) = \frac{1}{x-1} - 4$$

$$\left(\frac{-1}{-1(x-1)}\right) = \frac{1}{x-1}$$

* Announce: Quiz on March 4 (Wed) and Unit Test on March 9 (Mon)

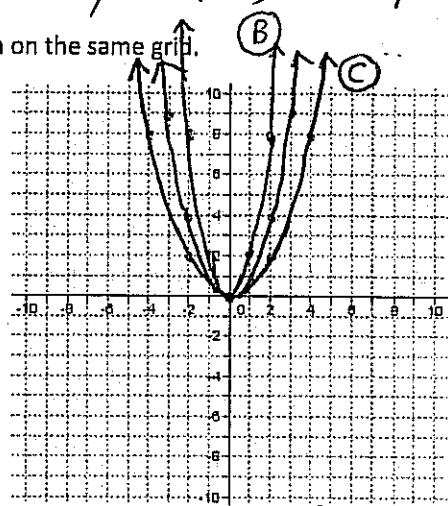
MCR3U

Vertical and Horizontal Stretches and Compressions

Vertical Stretch and Compressions: Comparing functions of the form $y = f(x)$ and $y = af(x)$

Create the table of values for the given functions and graph them on the same grid.

* Stretching: y value (or x value) increases for the given x value (or y value)
 * Compression: y value (or x value) decrease for the given x value (or y value)



(A) $y = x^2$ (B) $y = 2x^2$ (C) $y = 0.5x^2$
 $f(x)$ $2f(x)$ $\frac{1}{2}f(x)$
 $a=2$ $a=\frac{1}{2}$

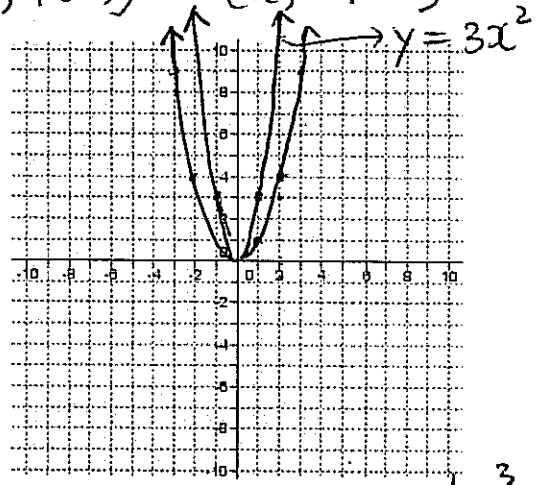
If $a > 1$, it stretches the parent function vertically. (= y coordinate \uparrow)
 If $0 < a < 1$, it compresses the parent function vertically. (= y coord \downarrow)

Mapping Notation:

To show the change in mapping notation we would write $(x, f(x)) \rightarrow (x, af(x))$

How you say it (State the transformations):

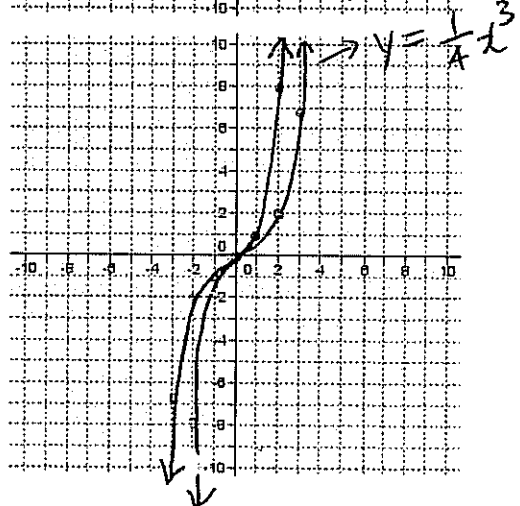
Example 1 For function $y = 3x^2$, what is the base function? Describe the transformation. Graph it.



Base Function is $y = x^2$ or $f(x) = x^2$

Offspring graph is stretched vertically by a factor of 3.
 OF is $3f(x)$, so y coordinates will increase by 3.

Example 2 For function $y = \frac{1}{4}x^3$, what is the base function? Describe the transformation. Graph it.



Parent Function: $y = x^3$ or $f(x) = x^3$
 Offspring Function is compressed (or decreased) vertically by a factor of $\frac{1}{4}$

OF is $\frac{1}{4}f(x)$, so y coordinates will decrease by $\frac{1}{4}$.

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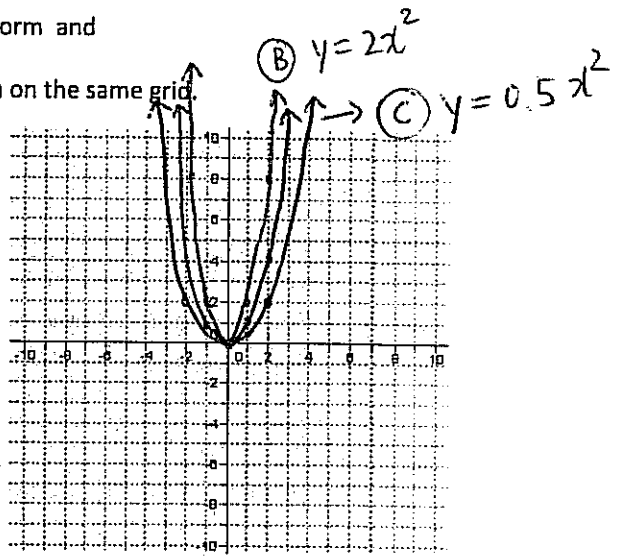
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Vertical and Horizontal Stretches and Compressions

Vertical Stretch and Compressions: Comparing functions of the form $y = ax^2$ and

Create the table of values for the given functions and graph them on the same grid.

$y = x^2$	$y = 2x^2$	$y = 0.5x^2$
x	y	x y
0	0	0 0
1	2	1 0.5
2	8	2 2
-1	2	



If, the graph _____

If, the graph _____

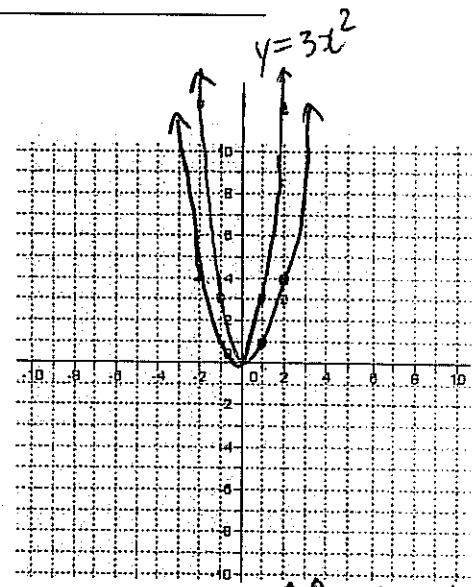
Mapping Notation:

To show the change in in mapping notation we would write

How you say it (State the transformations):

Example 1 For function $y = x^2$, what is the base function?
Describe the transformation. Graph it.

$y = x^2$	$y = 3x^2$
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Example 2 For function $y = x^3$, what is the base function?
Describe the transformation. Graph it.

$y = x^3$	$y = \frac{1}{4}x^3$
x y	x y
0 0	0 0
1 1	1 1/4
2 8	2 2
3 27	3 6.9

