March 21st

STRETCHES

Part 1 GRAPHING CALCULATORS

Use the graphing calculators to graph each of the image equations. Fill in the 'description' column of the following chart:

Basic Graph	Image	Description of Transformation
$y = x^2$	$y = 2x^2$	VS $\times 2$
$y = x^2$	$y = (2x)^2$	HS $\times \frac{1}{2}$
$y = x^3$	$y = \frac{1}{2}x^3 + 2$	VS $\times \frac{1}{2}$, 2 units up.
* Factor * $y = \lvert x \rvert$	$y = \lvert 3x + 6 \rvert$ $y = \lvert 3(x+2) \rvert$	HS $\times \frac{1}{3}$, 2 units left.
$y = x^2$	$y = (\frac{1}{2}x - 2)^2$ $y = (\frac{1}{2}(x-4))^2$	HS $\times 2$, 4 units right.
$y = \sqrt{x}$	$y = \sqrt{3x + 3}$	HS $\times \frac{1}{3}$, 1 unit left.
$y = \lvert x \rvert$	$y = 2\lvert x + 3 \rvert - 2$	VS $\times 2$, 3 units left, 2 units down

RULE
For the general function **y = f(x)**:

$y = \mathbf{a}f(x)$	$a > 1$, vertical stretch by factor a
$y = \mathbf{a}f(x)$	$0 < a < 1$, vertical ~~compression~~ by factor a
$y = f(\mathbf{b}x)$	$b > 1$, horizontal ~~compression~~ by factor 1/b
$y = f(\mathbf{b}x)$	$0 < b < 1$, horizontal stretch by factor 1/b

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Part 2 MAPPING NOTATION

Fill in the mapping Notation for each of the curves:

Basic Graph	Image	Mapping Notation
$y = x^2$	$y = 2x^2$	$(x,y) \rightarrow (x, 2y)$
$y = x^2$	$y = (2x)^2$	$(x,y) \rightarrow (\frac{1}{2}x, y)$
$y = x^3$	$y = \frac{1}{2}x^3 + 2$	$(x,y) \rightarrow (x, \frac{1}{2}y + 2)$
$y = \lvert x \rvert$	$y = \lvert 3x + 6 \rvert$	$(x,y) \rightarrow (\frac{1}{3}x - 2, y)$
$y = x^2$	$y = (\frac{1}{2}x - 2)^2$	$(x,y) \rightarrow (2x+4, y)$
$y = \sqrt{x}$	$y = \sqrt{3x + 3}$	$(x,y) \rightarrow (\frac{1}{3}x + 1, y)$
$y = \lvert x \rvert$	$y = 2\lvert x + 3 \rvert - 2$	$(x,y) \rightarrow (x-3, 2y-2)$