

Function Transformations and Inequalities

Today we will graph various functions using a table of values derived from the parent function with a given set of transformations.

The transformations follow the same algebraic structure as with the trigonometric functions from last semester.

First we need to define points from the parent functions.

$$y = x^2$$

quadratic

x	y
-2	4
-1	1
0	0
1	1
2	4

$$y = x^3$$

cubic

x	y
-2	-8
-1	-1
0	0
1	1
2	8

$$y = |x|$$

absolute
value

x	y
-2	2
-1	1
0	0
1	1
2	2

$$y = \sqrt{x}$$

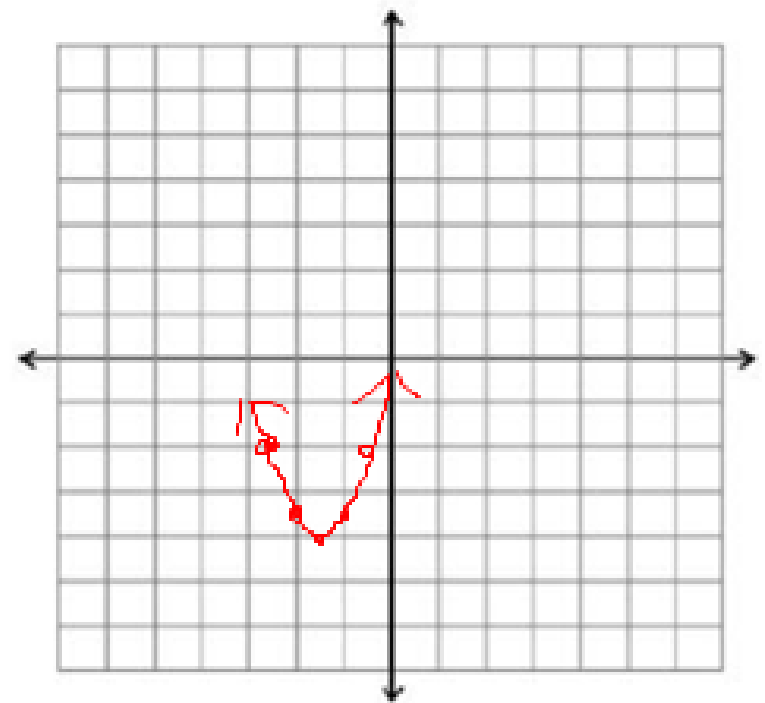
square root

x	y
0	0
1	1
4	2

Use a table of values to determine the critical points necessary to graph.

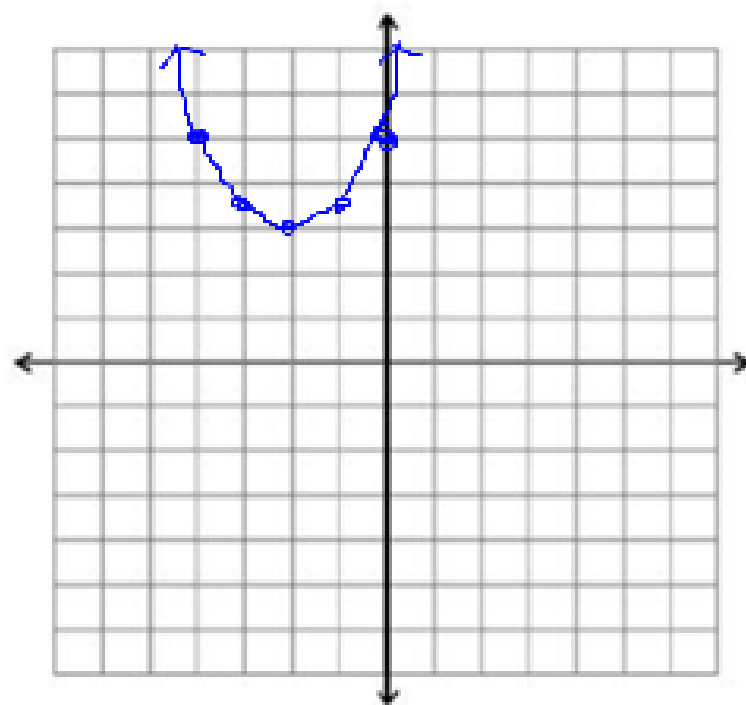
$$1. f(x) = \frac{1}{2}(2x + 3)^2 - 4$$

		X	g		
-2.5	-5	-2	4	2	-2
-2	-4	-1	1	1/2	-3.5
-1.5	-3	0	0	0	-4
-1	-2	1	1	1/2	-3.5
-0.5	-1	2	4	2	-2



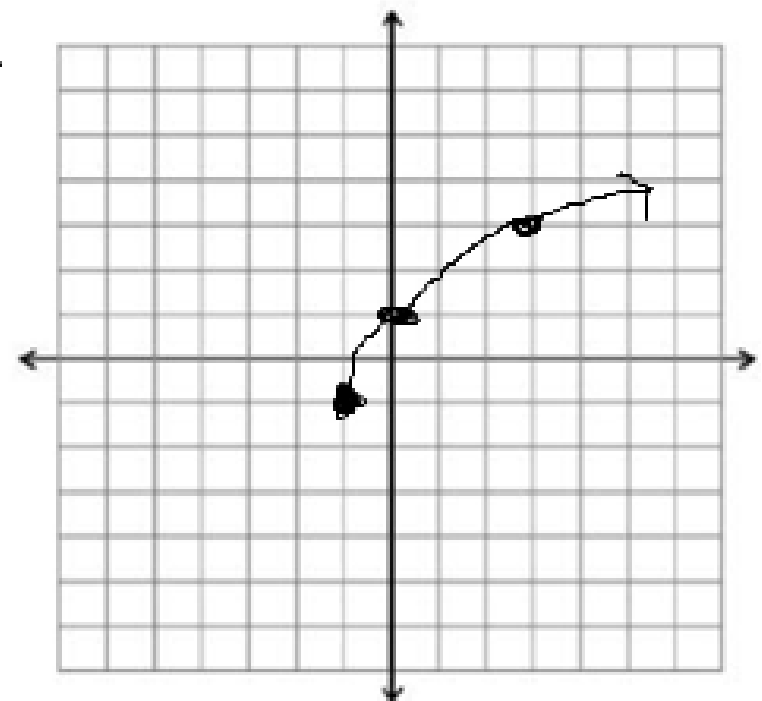
$$2. f(x) = \frac{1}{2}(x+2)^2 + 3$$

Subst	X	y	mult $\frac{1}{2}$	Add 3
-4	-2	4	2	5
-3	-1	1	$\frac{1}{2}$	3.5
-2	0	0	0	3
-1	1	1	$\frac{1}{2}$	3.5
0	2	4	2	5



$$3. \quad f(x) = 2\sqrt{x+1} - 1$$

Sub	x	y	Mult	Sub
-1	0	0	0	-1
0	1	1	2	1
3	4	2	4	3

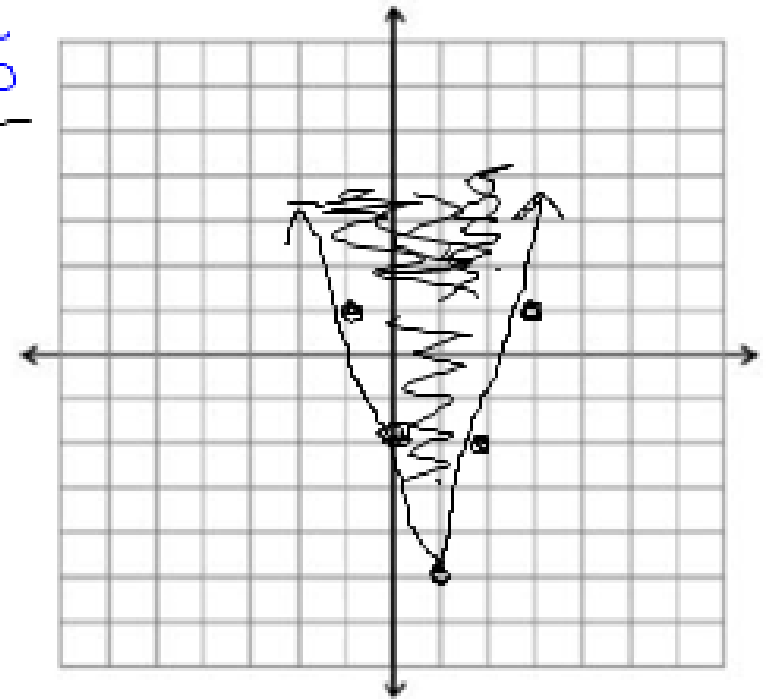


$$4. f(x) \Rightarrow \underline{3|x - 1|} - \underline{5}$$

greater y's
are
up

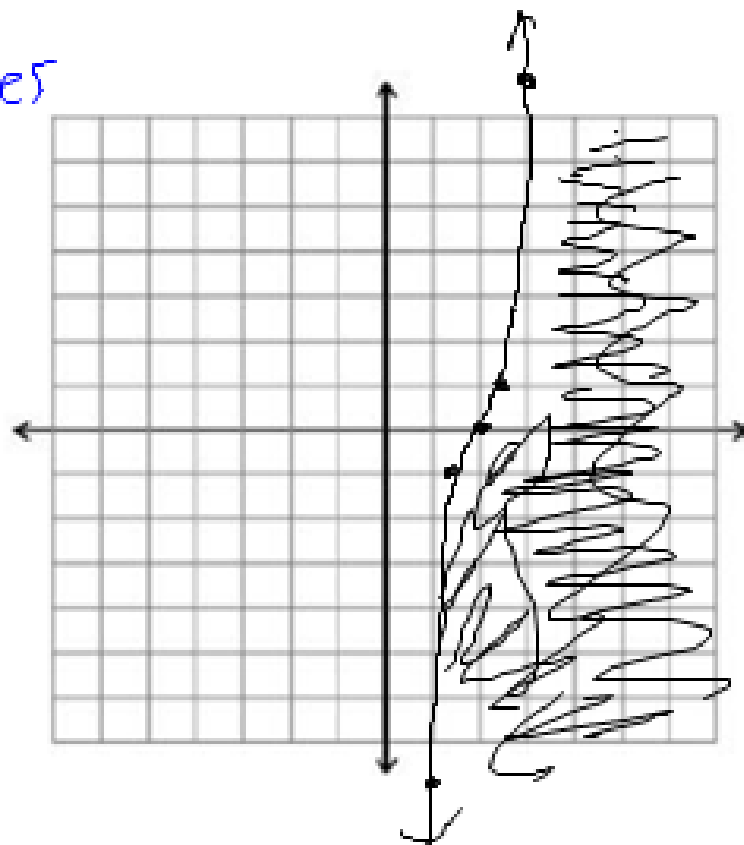
W&R - 0 - 1
Add 1

x	y	mult 3	sub 5
-2	-2	6	-1
-1	-1	3	-2
0	0	0	-5
1	1	3	-2
2	2	6	-1

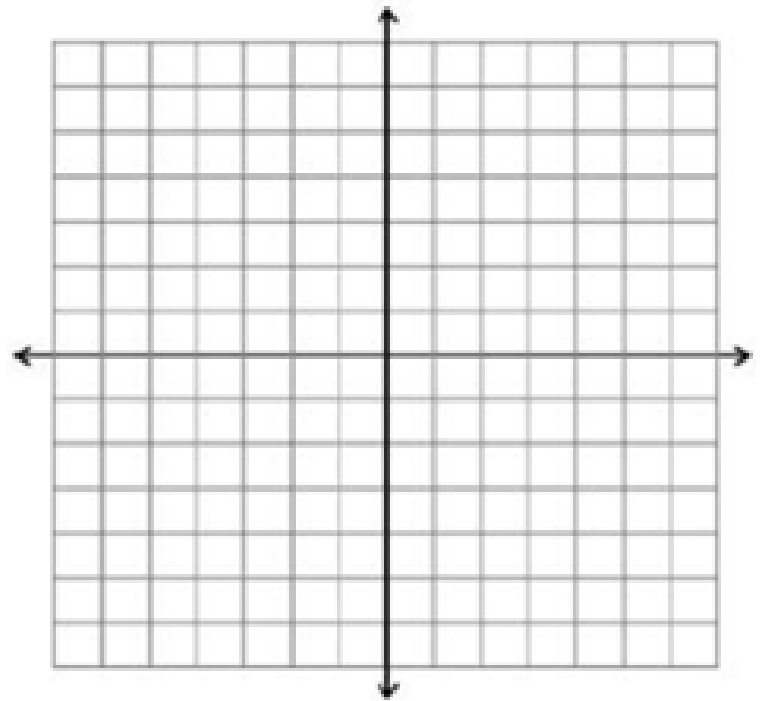


$$5. f(x) = (2x - 4)^3$$

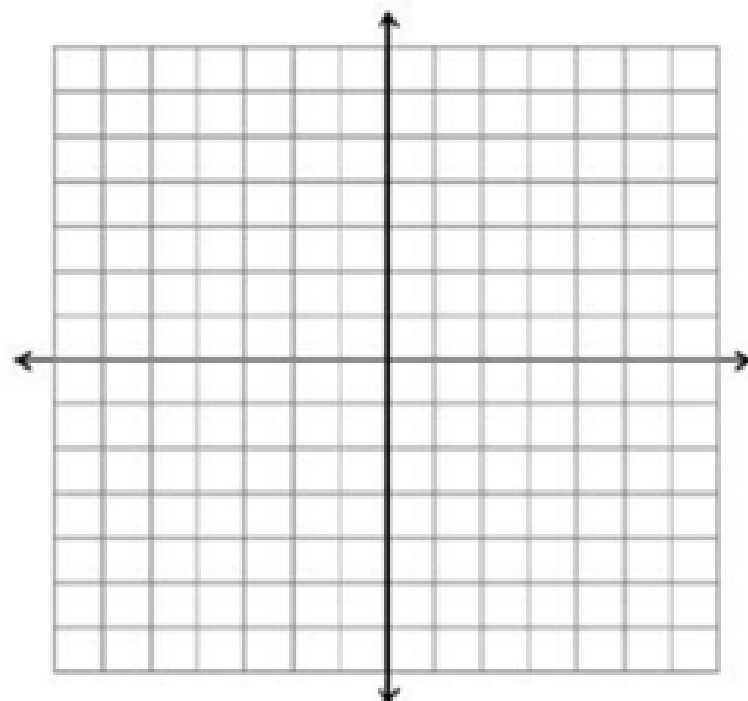
x	$2x - 4$	x	y	No changes
1	2	-2	-8	
1.5	3	-1	-1	
2	4	0	0	
2.5	5	1	1	
3	6	2	8	



6. $f(x) \stackrel{\text{graph}}{=} (x + 1)^2 + 3$



7. $f(x) = 3\sqrt{x - 5}$



Homework:
p150 #20-31 ON GRAPH PAPER