Today's Plan:

Learning Target (standard): I will describe and graph functions as composites of transformations.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Write each function as a composite of functions.

$$f(x) = -3\sqrt{\frac{1}{2}x + 4} - 5$$

Parent: $f(x) = \sqrt{x}$

1) $f(x) = -\sqrt{x}$ rx

2) $f(x) = -3\sqrt{x}$ v.s. by 3

3) $f(x) = -3\sqrt{\frac{1}{2}x}$ h.s. by 2

4) $f(x) = -3\sqrt{\frac{1}{2}(x+8)}$ shift lft 8

5) $f(x) = -3\sqrt{\frac{1}{2}x+4} - 5$ shift down 5

Write each function as a composite of functions.

$$f(x) = -\frac{4}{3}\left|-\frac{1}{2}x - 3\right| + 5$$

parent: $f(x) = |x|$

1) $f(x) = -|x|$ r_x

2) $f(x) = -|-x|$ r_y

3) $f(x) = -\frac{4}{3}|-x|$ v.s. by $\frac{4}{3}$

4) $f(x) = -\frac{4}{3}\left|-\frac{1}{2}x\right|$ h.s. by 2

5) $f(x) = -\frac{4}{3}\left|-\frac{1}{2}(x+6)\right|$ shift left 6

6) $f(x) = -\frac{4}{3}\left|-\frac{1}{2}x - 3\right| + 5$ shift up 5

Write each function as a composite of functions.

$$f(x) = -\frac{1}{5}(-2x - 8)^2 + 2$$

parent: $f(x) = x^2$

1) $f(x) = -x^2$ r_x

2) $f(x) = -(-x)^2$ r_y

3) $f(x) = -\frac{1}{5}(-x)^2$ v.c. by $\frac{1}{5}$

4) $f(x) = -\frac{1}{5}(-2x)^2$ h.c. by $\frac{1}{2}$

5) $f(x) = -\frac{1}{5}(-2(x+4))^2$ shift left 4

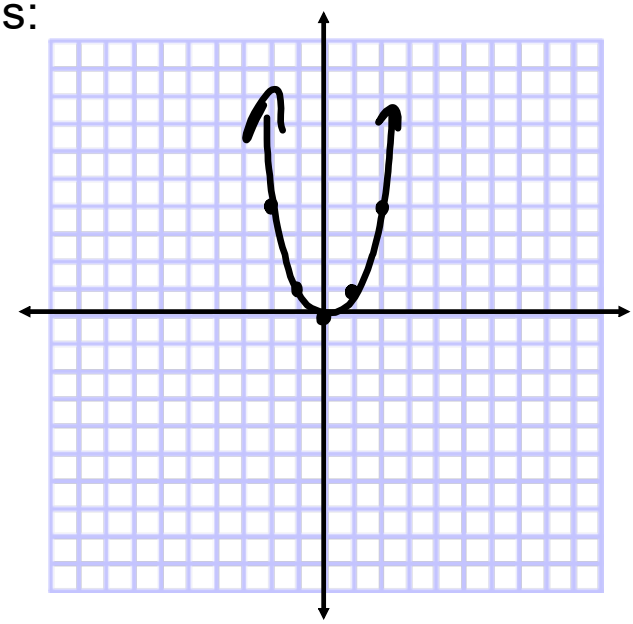
6) $f(x) = -\frac{1}{5}(-2x-8)^2 + 2$ shift up 2

Graph using Transformations:

- Parent Functions:

$$f(x) = x^2$$

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

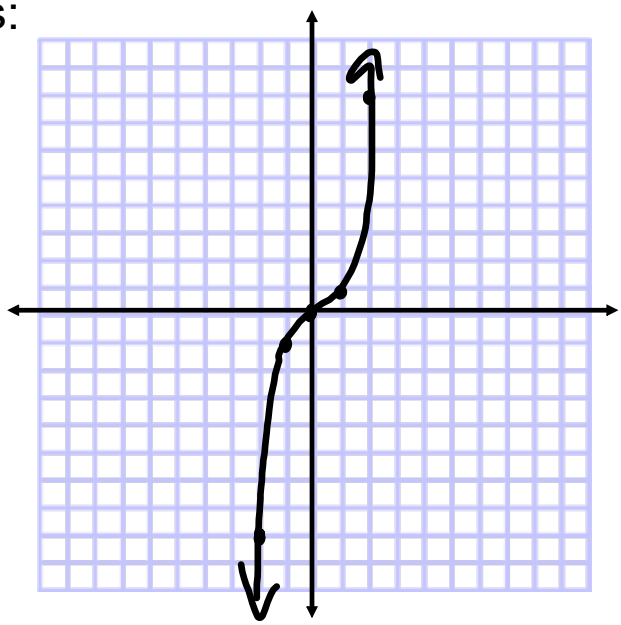


Graph using Transformations:

- Parent Functions:

$$f(x) = x^3$$

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

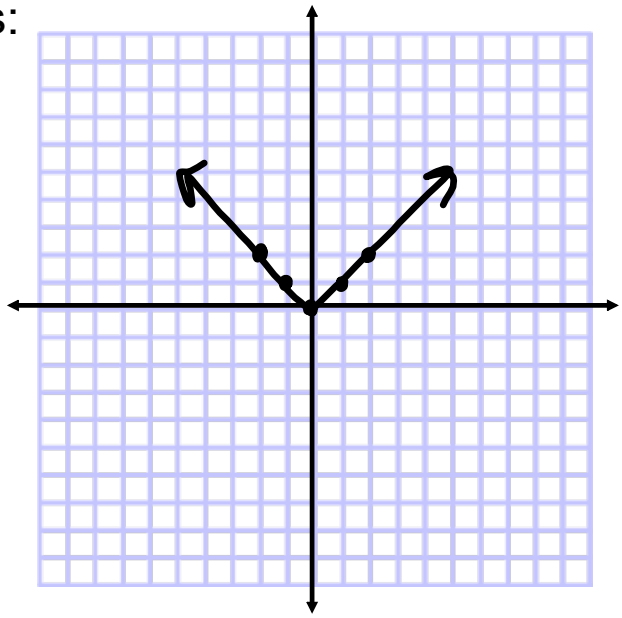


Graph using Transformations:

- Parent Functions:

$$f(x) = |x|$$

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

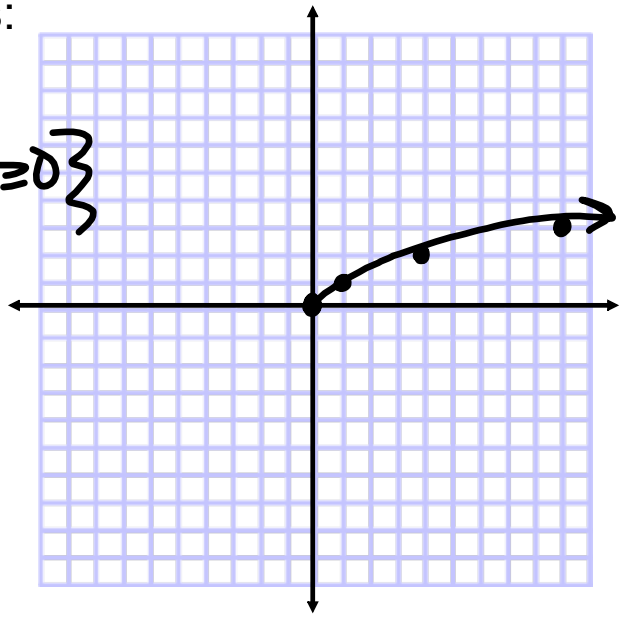


Graph using Transformations:

- Parent Functions:

$$f(x) = \sqrt{x}$$ D: $\{x \mid x \geq 0\}$

x	y
0	0
1	1
4	2
9	3



How to Transform:

outside operation = y-value
inside operation = x-value

1) reflection over the x-axis

- multiply the y-values by -1

2) reflection over the y-axis

- multiply the x-values by -1

How to Transform:

3) vertical stretch or compression

- multiply the y-values by the V.S./V.C. factor

4) horizontal stretch or compression

- multiply the x-values by the h.s./h.c. factor

How to Transform:

5) shift left or right

- add/subtract the shift factor to/from the x-values

6) shift up or down

- add/subtract the shift factor to/from the y-values

Graph using Transformations:

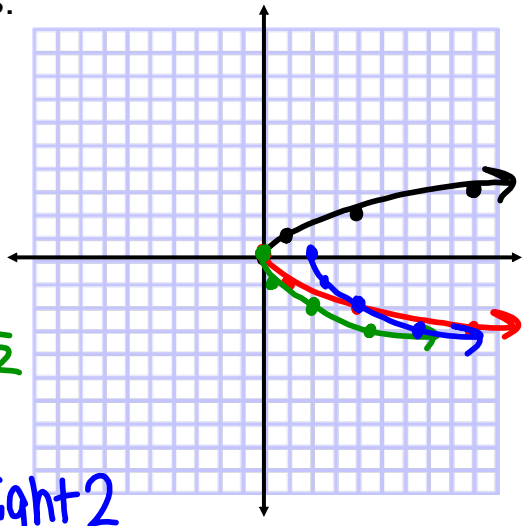
$$f(x) = -\sqrt{2x-4}$$

parent: $f(x)=\sqrt{x}$

1) $f(x)=-\sqrt{x}$ r x

2) $f(x)=-\sqrt{2x}$ h.c. by $\frac{1}{2}$

3) $f(x)=-\sqrt{2(x-2)}$ shift right 2



x	y
0	0
1	1
4	2
9	3

Assignment:

p.149 #2-34 even, 46, 47