

Sunday, October 07, 2018
6:49 PM

Precalc **KEY**

1.7B: Transformation of Functions

Obj: To transform functions involving vertical and horizontal reflections and shifts

Hwk: 1.7B #9 - 17 odd, 43, 45, 47

Finish 1.7B wksht (suggested. Answers will be posted)

1.6 - 1.7 Assessment on FRJ 10/12

Do Now:

1. Given $f(x) = (x + 1)^3 - 3$

a. Identify the parent graph

$$p(x) = x^3$$

b. Describe the transformation

Shift 1 left, 3 down

c. Rewrite $f(x)$ using function notation.

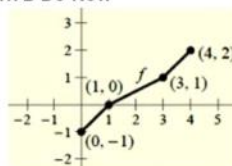
* Write f in terms of parent (p) $f(x) = p(x+1) - 3$

2. 1.7B Do Now Half Sheet

Name: _____ Date: _____ Period: _____

1.7B Do Now

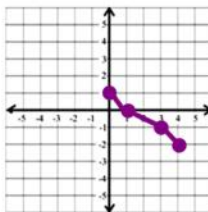
Use the graph of f to sketch g



* Reflect over X-AXIS

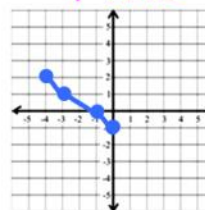
a) $g(x) = -f(x)$

| $f(x)$ | $g(x)$ |
|---------|---------|
| (0, -1) | (0, 1) |
| (1, 0) | (1, 0) |
| (3, 1) | (3, -1) |
| (4, 2) | (4, -2) |



b) $g(x) = f(-x)$

| $f(x)$ | $g(x)$ |
|---------|---------|
| (0, -1) | (0, -1) |
| (1, 0) | (-1, 0) |
| (3, 1) | (-3, 1) |
| (4, 2) | (-4, 2) |



* Reflect over Y-AXIS

Last class we talked about translating/shifting graphs.

How do you distinguish between shifting

LEFT/RIGHT

or

UP/DOWN?



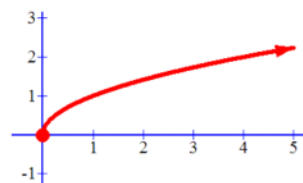
We also talked about reflections - how do you distinguish bet. reflecting left/right or up/down?

Reflection in the Coordinate Axes:

If given graph of $y = f(x)$, then

- Reflection in x -axis : $h(x) = -f(x)$
- Reflection in y -axis : $h(x) = f(-x)$

Ex. 1) Given $f(x) = \sqrt{x}$ with graph



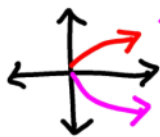
What will each of the following graphs look like?

a. $g(x) = -\sqrt{x}$

b. $h(x) = \sqrt{-x}$

c. $k(x) = -\sqrt{x+2}$

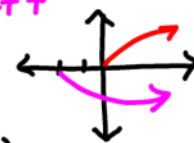
* Reflect over X-AXIS



* Reflect over Y-AXIS



* Reflect over X-AXIS, shift 2 left



Rewrite each using function notation

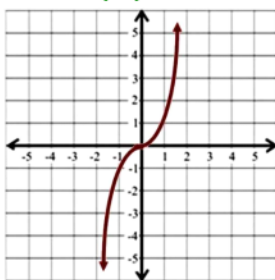
$g(x) = -f(x)$

$h(x) = f(-x)$

$k(x) = -f(x+2)$

Ex. 2) Given $f(x) = x^3$, what do you notice about reflections of odd functions?

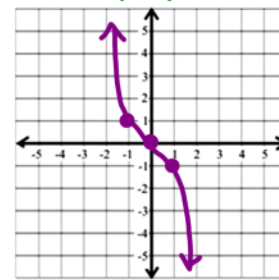
$f(x) = x^3$



$-f(x) =$



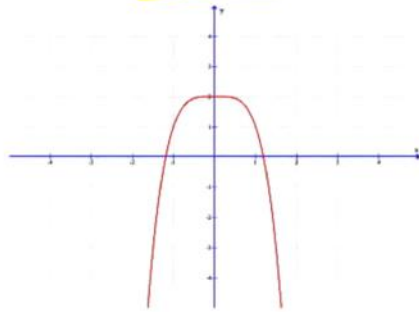
$f(-x) =$



They result in the same graph. Why?

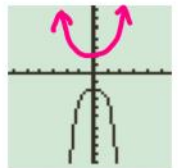
Ex. 3) Given $f(x) = x^4$; in your graphing calculators,
 a) Reflect $f(x)$ in the x-axis, then shift up 2 units.
 Write the equation of the transformed function.

$$g(x) = -x^4 + 2$$



- What happens if you reverse the order of transformations?
- Write the equation of the transformed function.

$$h(x) = -(x^4 + 2)$$



Why does this happen?

$$\text{Because } h(x) = -(x^4 + 2) = -x^4 - 2$$

FOLLOW THE ORDER OF OPERATIONS!!!

1. () first so
 - a. Horizontal reflect (mult.)
 - b. Horizontal shift (+/-)
2. Vertical reflect (mult.)
3. Vertical shift (+/-)

* Be careful!!! If given $\sqrt{-x+2} \Rightarrow \sqrt{-(x-2)}$

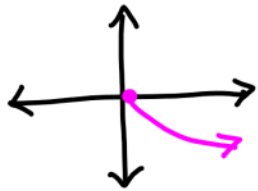
factor out " - " first!!!

Do 1.7B Classwork WS

If time:

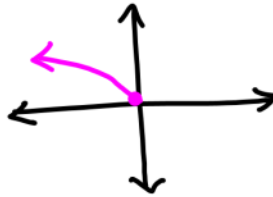
Notice the DOMAIN for each:

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



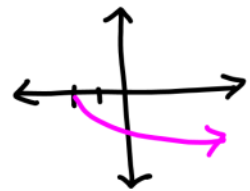
$$D: [0, \infty)$$

$$h(x) = \sqrt{-x}$$



$$D: (-\infty, 0]$$

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



$$D: [-2, \infty)$$