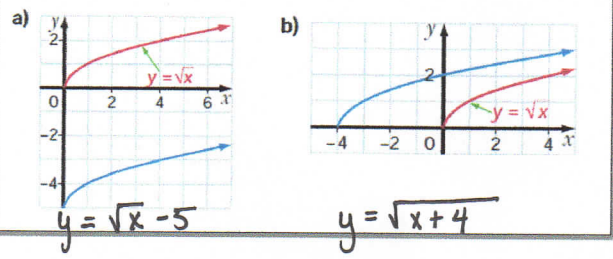


# Reflections (Lesson).notebook

## Warm-Up

1. Describe the vertical/horizontal transformations for each function.  
 a)  $y = (x - 4)$    b)  $y = \sqrt{x} - 10$    c)  $y = \sqrt{x+4} + 2$    d)  $y = (x + 6)^2 - 8$

2. Write an equation for each function drawn in blue.  
 (#5 from homework)



## UNIT #4: Inverses and Transformations of Functions

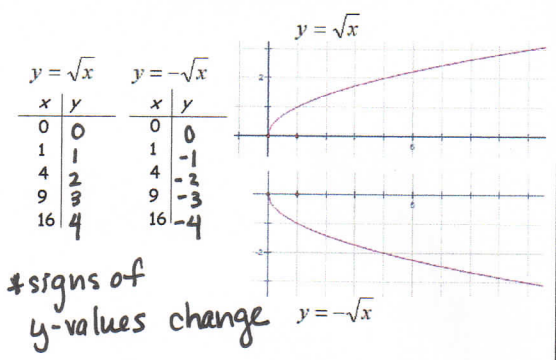
### Reflections

**Learning Goal:**  
 I will learn how to graph and interpret reflections of functions.

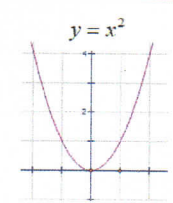


\*To compare each graph, keep x-values the same \*

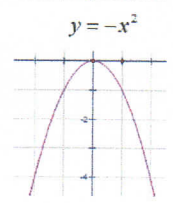
### Lesson: Reflections



$y = x^2$		$y = -x^2$	
x	y	x	y
-2	4	-2	-4
-1	1	-1	-1
0	0	0	0
1	1	1	-1
2	4	2	-4



\* y-values change  
 \* reflection in x-axis

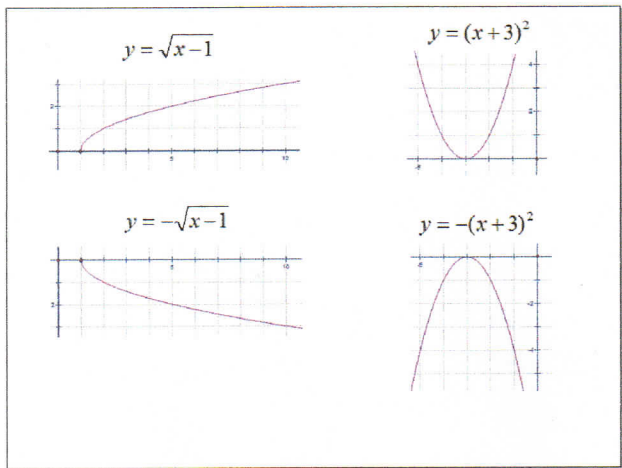


# Reflections (Lesson).notebook

x	y
1	0
2	1
5	2
17	4

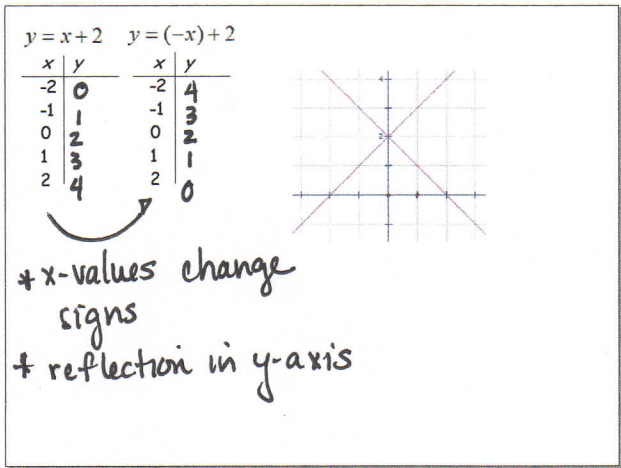
x	y
1	0
2	-1
5	-2
17	-4



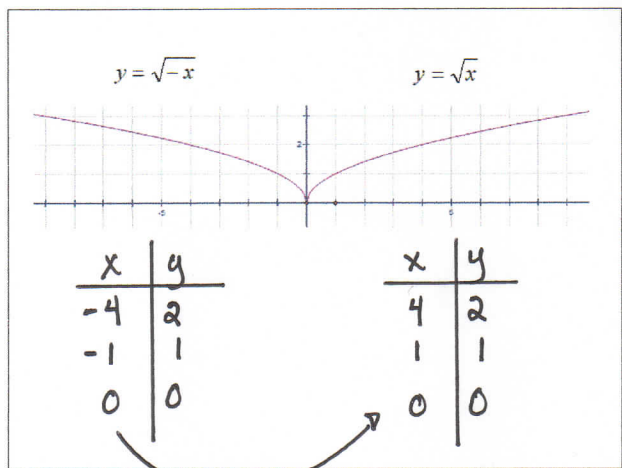
x	y
-4	1
-3	0
-2	-1
-1	-4

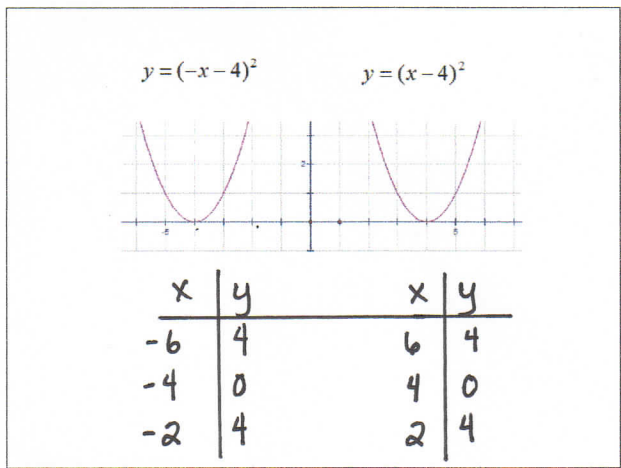
x	y
-4	-1
-3	0
-2	-1
-1	-4



+ x-values change signs  
+ reflection in y-axis



+ signs of x-values change



+ x-values change only.

# Reflections (Lesson).notebook

### Example:

The coordinates for the graph  $y = f(x)$  are shown below. What would be coordinates be for  $y = -f(x)$  and  $y = f(-x)$ ?

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

$y = f(x)$

x	y
-4	1
-2	-1
4	2

$y = -f(x)$

x	y
4	-1
2	1
-4	-2

$y = f(-x)$

" $-f(x)$ " means the same as " $-y$ ". Therefore each **y-value** is **multiplied by -1** which changes the sign. This causes a reflection in the x-axis.

" $f(-x)$ " means each **x-value** is **multiplied by -1** which changes the sign. This causes a reflection in the y-axis.

### Conclusions:

1. The graph of  $y = -f(x)$  is the graph of  $y = f(x)$  reflected in the x-axis.

Example:

$y = \sqrt{x-1}$   $\xrightarrow{\text{Reflection in x-axis}}$   $y = -\sqrt{x-1}$

2. The graph of  $y = f(-x)$  is the graph of  $y = f(x)$  reflected in the y-axis.

Example:

$y = \sqrt{x-1}$   $\xrightarrow{\text{Reflection in y-axis}}$   $y = \sqrt{-x-1}$

## UNIT 4: Inverses and Transformation of Functions

### Reflections

#### Learning Goal:

I will learn how to graph and interpret reflections of functions.

#### Success Criteria:

To be successful, I must be able to...

- Graph functions and their reflections
- Recognize that the graph of  $y = -f(x)$  is the graph of  $y = f(x)$  reflected in the x-axis.
- Recognize that the graph of  $y = f(-x)$  is the graph of  $y = f(x)$  reflected in the y-axis

#### Practice Work

Pg. 203 #1-3, 8, 10