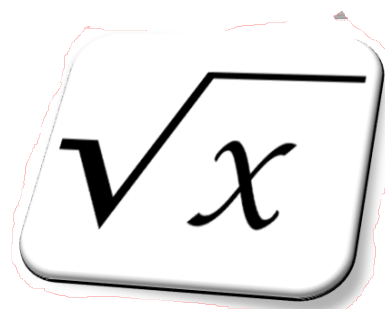
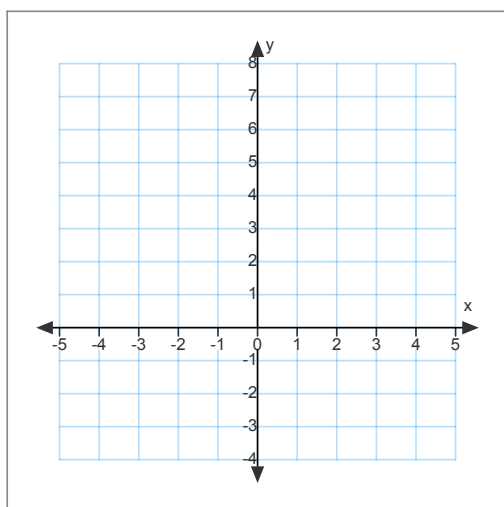


## Lesson 2

2.2 Square Root of a Function.Investigation: Comparing a Function and its Square Root.

Let's see if we can determine how a function and the square root of the function are related.

Consider the graph of  $y = 2x + 4$  and  $y = \sqrt{2x + 4}$   
Graph both functions on the same grid.

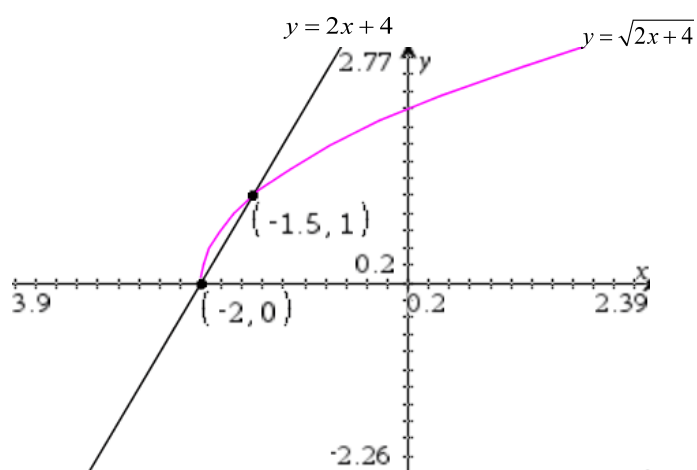


$x$	$y = 2x + 4$	$y = \sqrt{2x + 4}$
-3		
-2		
-1		
0		
1		
2		
3		

1. What are coordinates of the points where the graphs intersect? What are those points called?

Why do you think they are called this?

2. State the domain and range of each of the functions.



Do the graphs have the same domain?

Does the function  $y = \sqrt{2x+4}$  exist where  $2x+4 < 0$ ? Why not?

What are the restrictions on the variable?

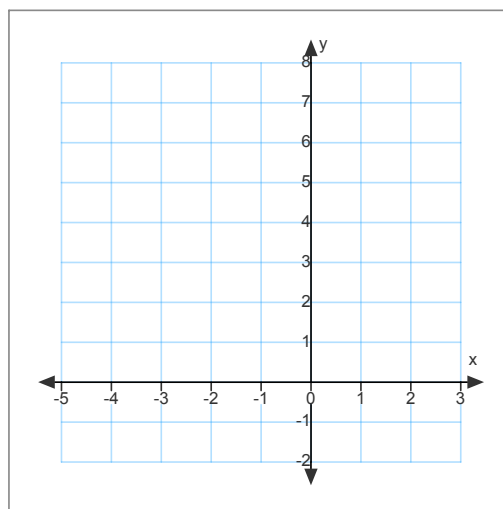
Solve the equation  $2x+4=0$ . Does your solution satisfy restrictions on the variable?

Where is  $f(x) < \sqrt{f(x)}$ ? Where is  $\sqrt{f(x)} < f(x)$ ? Where is  $\sqrt{f(x)}$  undefined?

Example 1: Given  $y = 3 - 2x$ , graph the functions  $y = f(x)$  and  $y = \sqrt{f(x)}$ .

a. Compare the two functions.

$x$	$y = 3 - 2x$	$y = \sqrt{3 - 2x}$
-2		
-1		
0		
1		
1.5		



State the domain and ranges of the functions.

Invariant points occur at

How could you determine the domain and range algebraically?



Summary: Relative Locations of  $y = f(x)$  and  $y = \sqrt{f(x)}$

Value of $f(x)$	$f(x) < 0$	$f(x) = 0$	$0 < f(x) < 1$	$f(x) = 1$	$f(x) > 1$
Relative location of Graph of $y = \sqrt{f(x)}$	The graph of $y = \sqrt{f(x)}$ is undefined	The graphs of $y = \sqrt{f(x)}$ and $y = f(x)$ intersect on the x-axis.	The graph of $y = \sqrt{f(x)}$ is above the graph of $y = f(x)$	The graph of $y = \sqrt{f(x)}$ intersects the graph of $y = f(x)$	The graph of $y = \sqrt{f(x)}$ is below the graph of $y = f(x)$

Compare the Domain and Ranges of  $y = f(x)$  and  $y = \sqrt{f(x)}$

Example 2: Using technology, identify and compare the domain and ranges of the following pairs of functions.

a.  $y = 4 - x^2$  and  $y = \sqrt{4 - x^2}$

Domain:  
Range:

Domain:  
Range:

b.  $y = x^2 - 4$  and  $y = \sqrt{x^2 - 4}$

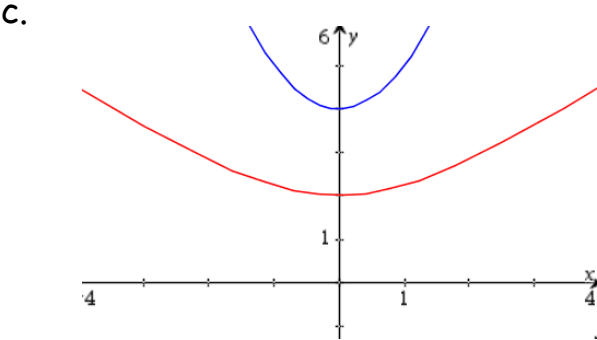
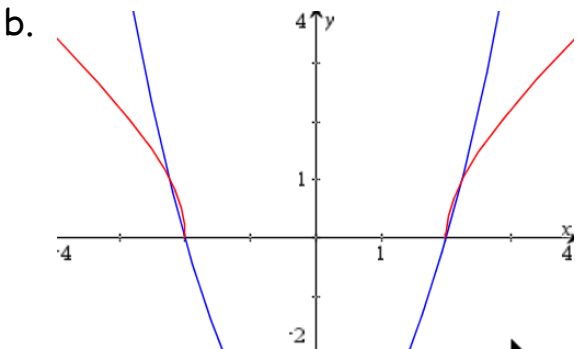
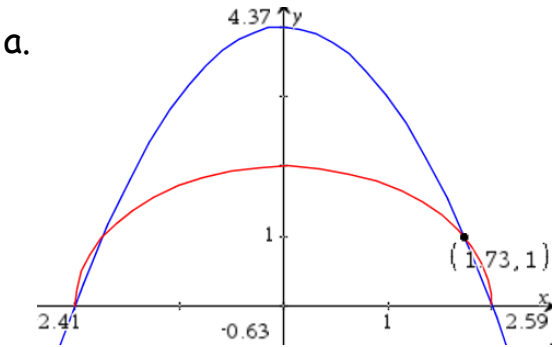
Domain:  
Range:

Domain:  
Range:

c.  $y = x^2 + 4$  and  $y = \sqrt{x^2 + 4}$

Domain:  
Range:

Domain:  
Range:



Your Turn: Identify and compare the domain and ranges of the functions.

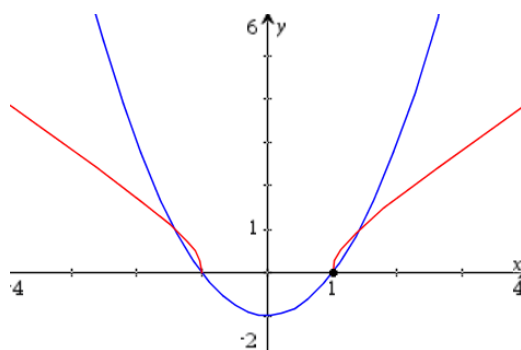
$$y = x^2 - 1 \quad \text{and} \quad y = \sqrt{x^2 - 1}$$

Domain:

Range:

Domain:

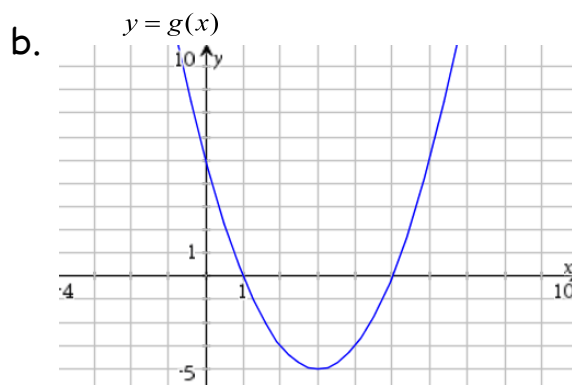
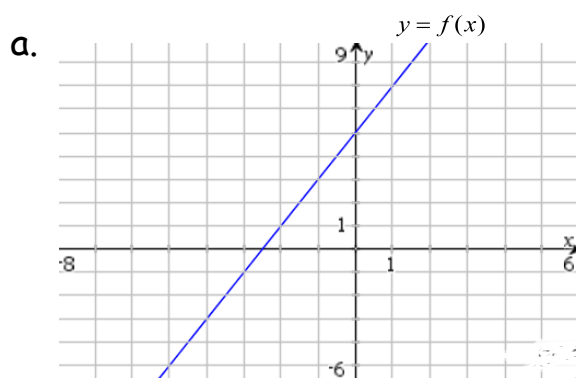
Range:





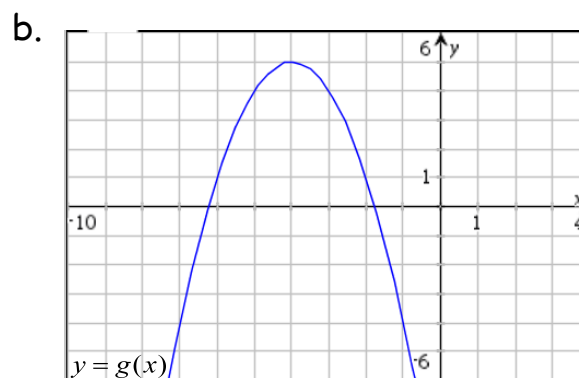
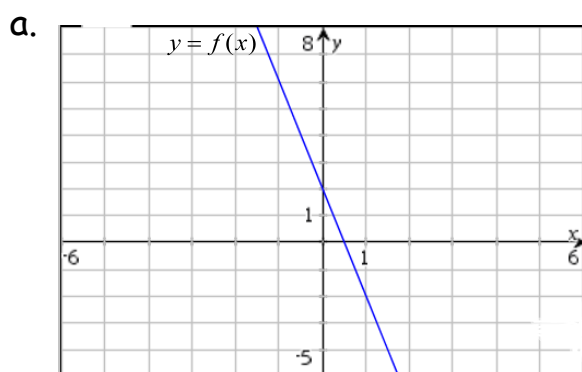
**Example 3:** Graph the Square Root of a Function From the Graph of the Function

Using the graphs of  $y = f(x)$  and  $y = g(x)$ , sketch the graphs of  $y = \sqrt{f(x)}$  and  $y = \sqrt{g(x)}$ .



Your Turn: Graph the Square Root of a Function From the Graph of the Function

Using the graphs of  $y = f(x)$  and  $y = g(x)$ , sketch the graphs of  $y = \sqrt{f(x)}$  and  $y = \sqrt{g(x)}$ .



Note: Review the 'Key Ideas' on page 85 of your text

# Homework

1. Assignment Handouts:

BLM 2-3, 'Check Your Understanding - Graphs'  
or BLM 2-4, 'Square Root of a Function'.



2. Text Pages 86 - 89, Exercises # 1 - 6, 8 - 11,  
13, C3, C4

## Attachments

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Translations Assignment 1.doc

Transforming Radicals.pdf