Name: _____ Period: _____ Date: _____

That's Radical Dude!

Let's explore radical functions. By definition, a radical function is one that contains any sort of radical. We are going to explore two of the more common radical functions, the square root, and the cube root.
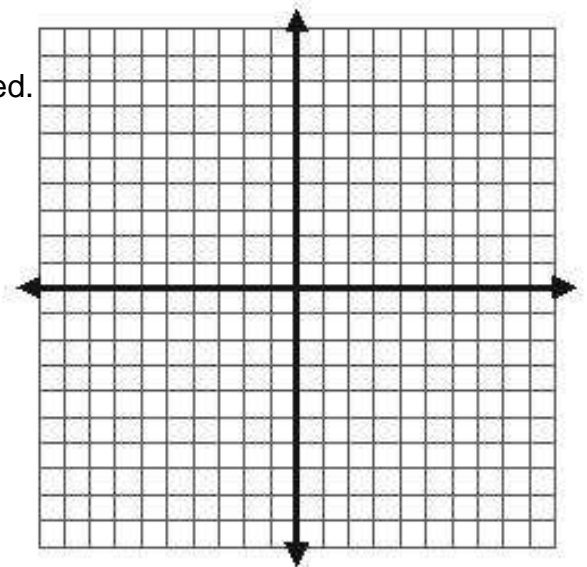
1. Complete the table of values for the function, $f(x) = \sqrt{x}$. This is the square root function.

x	-4	-3	-2	-1	0	1	2	3	4
f(x)									

    a. What did you notice about some of the values?

    b. If you typed the function into a calculator and tried to evaluate it for some of the x-values, what message appeared? Why?

    c. Imagine you are using a calculator that does not have a square root symbol but does allow you to enter exponents. Rewrite $f(x) = \sqrt{x}$ using exponents instead of the radical symbol.

2. Graph the square root function in the grid provided.

    a. What is the domain of this function?

    b. What is the range of the function?
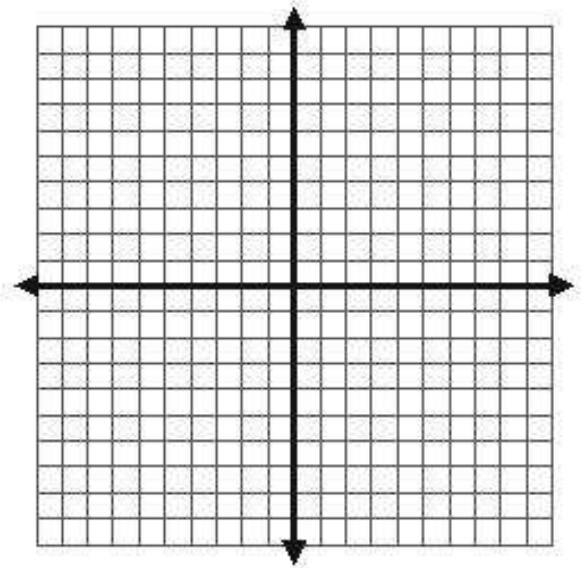
3. Complete the table of values for the function, $f(x) = \sqrt{x+2}$.

x	-4	-3	-2	-1	0	1	2	3	4
f(x)									

    a. What did you notice about some of the values?

    b. If you typed the function into a calculator and tried to evaluate it for some of the x-values, what message appeared? Why?

    c. Imagine you are using a calculator that does not have a square root symbol but does allow you to enter exponents. Rewrite, $f(x) = \sqrt{x+2}$ using exponents instead of the radical symbol.

    d. Not every x-value will produce a y-value. You can't take the square root of negative numbers so some of the values will yield an error message on the calculator. This time though, not all the negative x-values produced an error message. Why is that?

4. Graph the function in the grid provided

    a. What is the domain of this function?

    b. What is the range of the function?

5. Complete the table of values for the function, f(x)=√(9-x^2). $f(x) = \sqrt{9 - x^2}$

x	-4	-3	-2	-1	0	1	2	3	4
f(x)									

    a. What did you notice about some of the values?

    b. If you typed the function into a calculator and tried to evaluate it for some of the x-values, what message appeared? Why?

    c. Not every x-value will produce a y-value. You can't take the square root of negative numbers so some of the values will yield an error message on the calculator. This time though, even some of the positive numbers produced an error message. Why is that?

    d. Imagine you are using a calculator that does not have a square root symbol but does allow you to enter exponents. Rewrite $f(x) = \sqrt{9 - x^2}$. using exponents instead of the radical symbol.

6. Graph the function in the grid provided.
    a. What is the domain of this function?

    b. What is the range of the function?
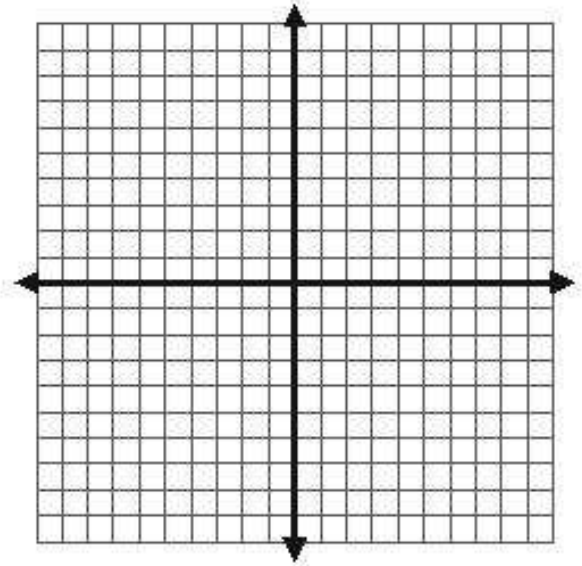
7. Using the three examples above, make a conjecture about the domain of a radical function.

8. Use your conjecture to determine the domain of this function, $f(x) = \sqrt{2x+5}$, without graphing it. Check your solution by graphing it on a graphing calculator.

9. Now let's look at another common radical function, the cube root.

Complete the table of values for the function, $f(x) = \sqrt[3]{x}$.

x	-8	-6	-2	-1	0	1	2	6	8
f(x)									

   a. Do you get any of the same error messages for this function that you did in the table of values for the square root function? Why do you think that is so?

10. Graph the function in the grid provided.
   a. What is the domain of this function?

   b. What is the range of the function?