MATH 1010 TNG LAB ACTIVITY: RADICALS

Part I: A Real World Application of Square Roots

Skid Distance

The faster a car is moving, the more distance it will take to stop. Using mathematics, a we can find safe following distances for various speeds. The same concept can be used by law enforcement personal to gather evidence after an accident occurs.

One recommendation for a safe following distance when driving is to allow 1 car length for each 10 mph of speed. So if you were driving 50 mph, you should have 5 car lengths in between yourself and the car in front of you.

Supposing your car is 13.6 feet long (about average), fill in the table below using the above recommendation of 1 car length for each 10 mph.

Speed in miles per hour	Recommended Distance Between Cars
20	
30	
40	
50	
60	
70	

Your textbook introduces the formula $r(L) = 2\sqrt{5L}$ to calculate the rate r at which at car was moving when it left skid mark L feet long (Section 7.3, #88). For each distance in the table above, use this formula to calculate the rate or speed of the car that created the skid marks.

Skid Distance L	Rate $r(L)$ in miles per hour

Based on this information, do you think the recommended 1 car length for every 10 mph is a good recommendation for the safe distance between cars?

If you were advising a new driver about following distance, what would you recommend?

Do you drive to close to the car in front of you? Be honest!

In reality, the mathematics is much more complicated! The skid distance will depend on many different variables. Click on the following link to discover the truth: http://mathcentral.uregina.ca/beyond/articles/rcmp/accident.html.

In the formula $S = 15.9\sqrt{\frac{R \cdot (f \pm e)}{2}}$, what do the variables *f* and *e* represent? Does it make sense that these variables would effect the skid distance?

Discuss the concept of skid distance with your lab buddies. Have you ever skidded in your car? How did the road conditions contribute to the outcome?

Part II: Graphing Radical Functions

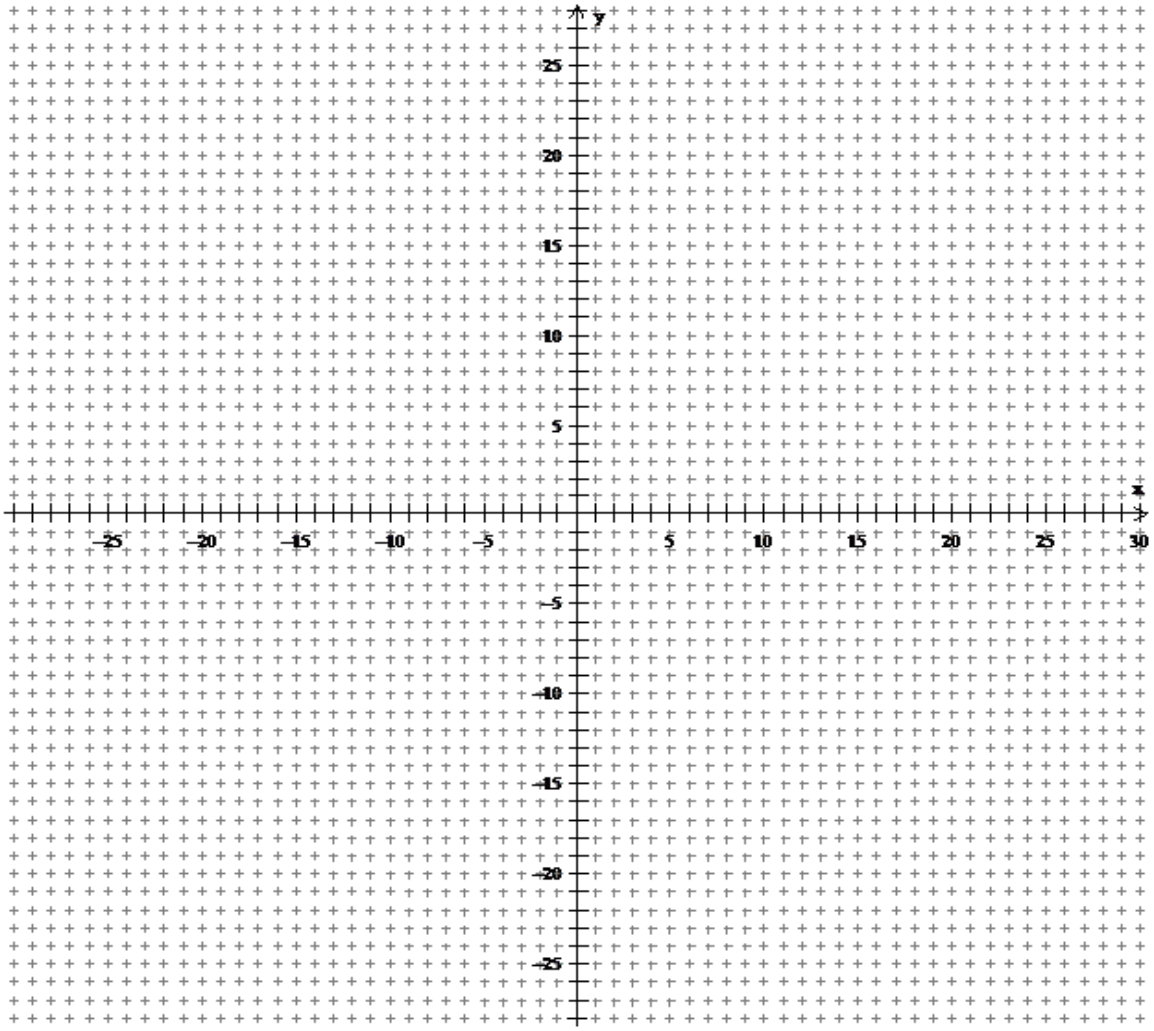
Graphing the Square Root Function

Given the function $f(x) = \sqrt{x}$

1. State the domain of the function:

2. List at least **five** exact (*x*, *y*) ordered pairs that lie on the graph. Think about the domain as you choose your *x* values!

3. Use your points to graph the function.



5. Compare your graph to the graph of another student. Are they the same? Did you use the same points? Discuss the graph with your lab buddy and be sure you agree.

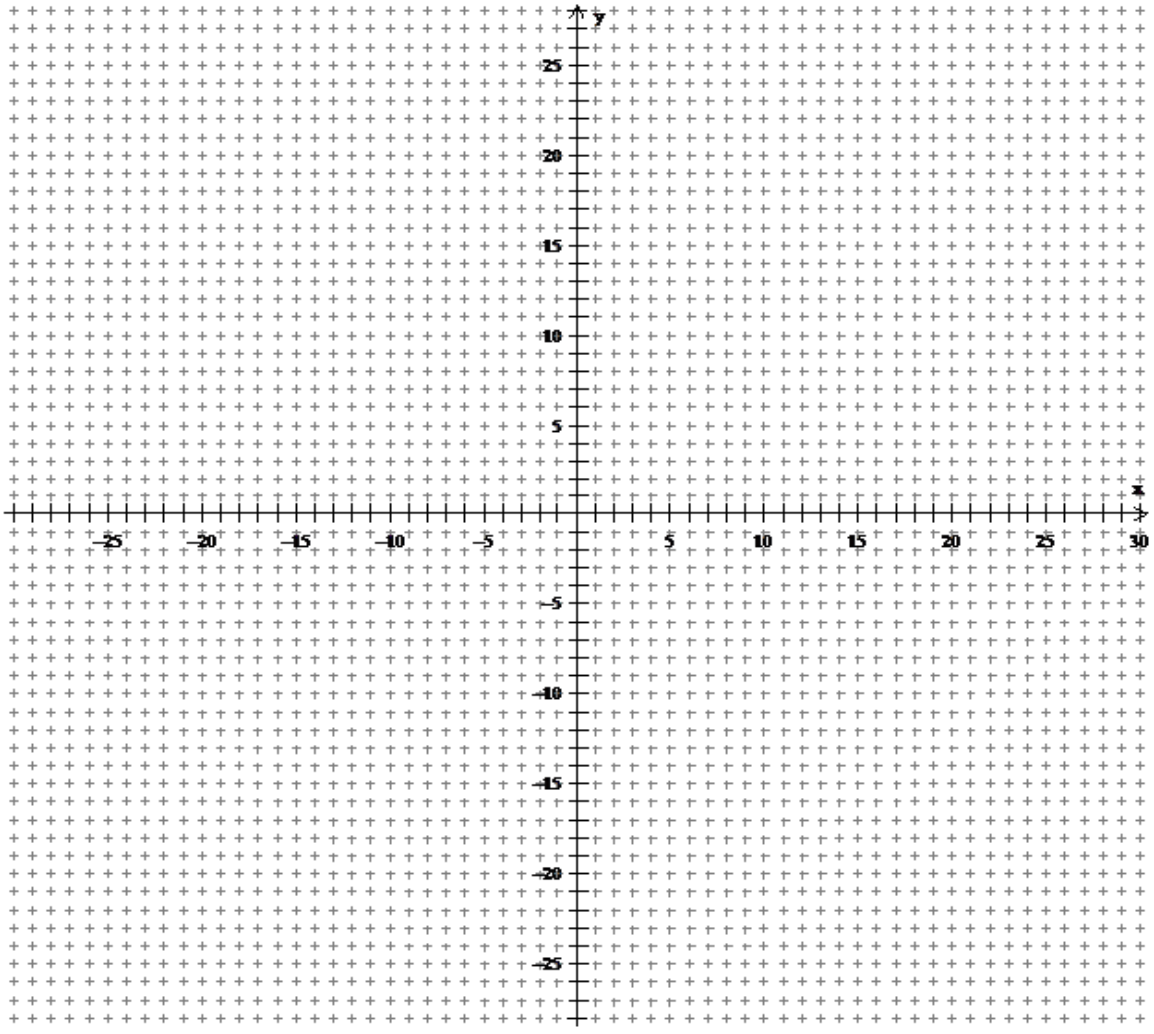
Graphing the Cube Root Function

Given the function $f(x) = \sqrt[3]{x}$

1. State the domain of the function:

2. List at least **five** exact (*x*, *y*) ordered pairs that lie on the graph. Think about the domain as you choose your *x* values!

3. Use your points to graph the function.



5. Compare your graph to the graph of another student. Are they the same? Did you use the same points? Discuss the graph with your lab buddy and be sure you agree.