STOP!

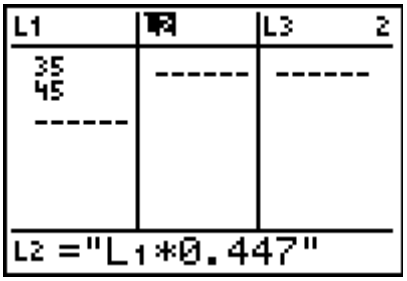
Name _____

Class _____

Problem 1 – Conversions

In the U.S. the customary measurement system is used. It is sometimes difficult to compare units of measure in metric units when you are familiar with other types of units.

Start by converting 35 mph and 45 mph to meters/second. Enter 35 and 45 in **L1**.



Move to the top of **L2** and enter the formula **"L1*0.447"**.

Enter more values in L1 to discover the relationship.

1. What do you notice about the number for miles per hour as compared to the number for meters per second?

Problem 2 – Stopping Distance and Speed

You know the stopping distance, in meters, of a car on dry pavement. You want to calculate the rate (speed) of a car in m/sec. The formula $r = 2\sqrt{5l}$ calculates the rate.

2. What is the value of *r* when *l* = 20? Show your work here.

Determine what a reasonable stopping distance, in meters, might be for a car traveling through a school zone. Enter your stopping distance in **L3**. Then enter the formula for rate, shown above, in **L4**. Replace *l* with L3.

3. Record your distance here:

4. What was the speed of the car before it stopped? Is this speed what you expected? Explain.

(Return to L1 and L2 above to convert to miles per hour, if needed.)

Input a speed *r* for a car that might be on a highway into **L5**. Remember, your rate must be in meters per second. Use the formula $l = \frac{r^2}{20}$ in **L6** to find the stopping distance.

5. Record your speed here.

6. What is the stopping distance of the car? Is this distance what you expected? Explain.

Run the program **STOPDATA**. Press [STAT] [ENTER] to view the lists.

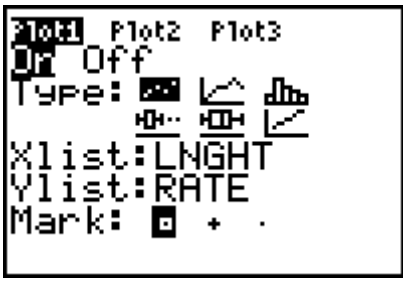
View the length and rate values in **LNGHT** and **RATE**.

7. What do you notice about the relationship between *length* and *rate*?

8. What does the ordered pair (0, 0) represent?

Set up a scatter plot of **RATE** vs. **LNGHT**. Press [ZOOM] and select **ZoomStat** to view the plot.

9. Describe the shape of the plot.



10. How does the shape compare to previous functions you have studied?

11. What is the domain and range of the relationship between rate and length?

12. What describes the relationship between length (distance) and rate (speed)?

Direct Inverse Quadratic Indirect

13. The shape of the plot is linear. True or False? Explain your reasoning.

Enter $2\sqrt{5x}$ into **Y1** and graph with the scatter plot.

14. If needed, revise your statements from above to clearly describe the shape of the graph and the relationship between the variables.

15. Why does this graph begin at (0, 0)? Why are all of the points in Quadrant I?

Homework

The following formula calculates the length, *x*, of a room when the area, *A*, of the room is known: $x = \sqrt{3A}$. Show your work for each problem.

1. If the area of the room is 108 feet squared, what is the length of the room?

2. If the length of the room is 36 feet, what is the area of the room?

3. Which variable was easier to calculate? Explain your reasoning.