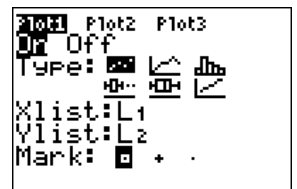


Discovering a Line of Best Fit with a Graphing Calculator

Distance from Palmyra to	To the Nearest Mile	To the Nearest Kilometer
Vineland, NJ	36	58
Trenton, NJ	34	54
Philadelphia, Pa	13	21
Hershey, Pa	108	173
High Point, NJ	152	243
Ship Bottom, NJ	58	93
New York, NY	85	136
Cape May, NJ	98	157
Pennsauken, NJ	6	10
Medford Lakes, NJ	20	32

1. Create a paper graph of the data in the chart. Place the miles along the x-axis and the kilometers along the y-axis.
2. Describe two things that this graph tells you about the data in the chart.
3. Draw a line of best fit for this data.
4. Predict how far it would be from Palmyra to Woodbury in kilometers if the distance was 17 miles.
5. Predict how far it would be from Palmyra to Long Branch in miles if the distance was 139 kilometers.
6. Using your graphing calculator:

- ▶ place the miles measurements in L1 and the kilometer measurements in L2.
- ▶ create an appropriate window to view the same data in the chart.
- ▶ turn on a scatter plot as illustrate at the right
- ▶ press GRAPH to view a graph of the data



7. How does the graph compare to the one you drew on paper?
8. What do you notice about all the distances when you measure them in kilometers rather than miles?

9. On your graphing calculator set up L3 to divide L2/L1 as illustrated at the right. Explain what this list of numbers tells you.

L1	L2	L3
36	58	-----
34	54	
13	21	
108	173	
152	243	
58	93	
85	136	

L3 = L2 / L1

10. If you were asked to predict to one decimal place accuracy what L2/L1 was equal to what would you answer?
11. Use the approximation you used in question 10 to predict

- ▶ the distance from Palmyra to Woodbury in kilometers if the distance was 17 miles.
- ▶ the distance from Palmyra to Long Branch in miles if the distance was 139 kilometers.

12. On you graph the kilometers were graphed on the y axis and the miles were graphed on the x axis. Therefore, we could say that $\frac{\text{kilometers}}{\text{miles}} = \frac{y}{x}$. What would you say the ratio of $\frac{\text{kilometers}}{\text{miles}}$ would be

based on the information you have collected? This means that $\frac{y}{x} = \underline{\hspace{2cm}}$. Rewrite this equation so we can enter it in the calculator in the form $y = \underline{\hspace{2cm}}$

13. Enter your equation from question 12 in the graphing calculator in y1. Press GRAPH. Does this line agree with the line you drew on the paper graph?

14. On the graphing calculator, use the graph:

- ▶ To predict how far it would be from Palmyra to Woodbury in kilometers if the distance was 17 miles.
- ▶ To predict how far it would be from Palmyra to Long Branch in miles if the distance was 139 kilometers.

15. On the graphing calculator:

- ▶ Create a table by pressing TBLSET and setting up the table as illustrated at the right.
- ▶ Press Table and you can enter numbers in the x column to find values in the equation.
- ▶ Predict how far it would be from Palmyra to Woodbury in kilometers if the distance was 17 miles.
- ▶ Predict how far it would be from Palmyra to Long Branch in miles if the distance was 139 kilometers.

TABLE SETUP	
TblStart=0	
ΔTbl=1	
Indpt: Auto	Ask
Depnd: Auto	Ask

16. Use any method explored above to predict the following:

- ▶ the distance from Palmyra to Atlantic City in kilometers if the distance is 66.3 miles.
- ▶ the distance from Palmyra to Six Flags Great Adventure in miles if the distance is 26.1 kilometers.