



Graphing Calculator Investigation

A Follow-Up of Lesson 7-2

Sharp EL-9600c

Modeling Real-World Data

You can use a Sharp EL-9600c to model data whose curve of best fit is a polynomial function.

Example

The table shows the distance a seismic wave can travel based on its distance from an earthquake's epicenter. Draw a scatter plot and a curve of best fit that relates distance to travel time. Then determine approximately how far from the epicenter the wave will be felt 8.5 minutes after the earthquake occurs.

Source: University of Arizona

Travel Time (min)	1	2	5	7	10	12	13
Distance (km)	400	800	2500	3900	6250	8400	10,000

Step 1 Enter the travel times in L1 and the distances in L2.

KEYSTROKES: Refer to page 87 to review how to enter lists.

Step 2 Graph the scatter plot.

KEYSTROKES: Refer to page 87 to review how to graph a scatter plot.

Step 3 Compute and graph the equation for the curve of best fit. A quartic curve is the best fit for these data.

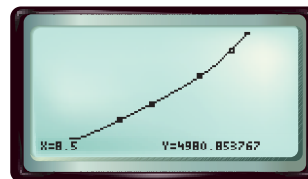
KEYSTROKES: **STAT** **ALPHA** [D] 06

ENTER **Y=** **VARS** **ALPHA** [H]

ENTER **ALPHA** [B] 1 **GRAPH**

Step 4 Use the **CALC** feature to find the value of the function for $x = 8.5$.

KEYSTROKES: Refer to page 87 to review how to find function values.



[0, 15] scl: 1 by [0, 10000] scl: 500

After 8.5 minutes, you would expect the wave to be felt approximately 5000 kilometers away.

Exercises 1. See pp. 407A–407H.

Use the table that shows how many minutes out of each eight-hour work day are used to pay one day's worth of taxes.

1. Draw a scatter plot of the data. Then graph several curves of best fit that relate the number of minutes to the year. Try Rg_{ax+b} , Rg_{x^2} , and Rg_{x^3} .
2. Write the equation for the curve that best fits the data. **See margin.**
3. Based on this equation, how many minutes should you expect to work each day in the year 2010 to pay one day's taxes? **about 184 min**

Year	Minutes
1940	83
1950	117
1960	130
1970	141
1980	145
1990	145
2000	160

Source: Tax Foundation



www.algebra2.com/other_calculator_keystrokes