



# Graphing Calculator Investigation

A Follow-Up of Lesson 7-2

Sharp EL-9900

## Modeling Real-World Data

You can use a Sharp EL-9900 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

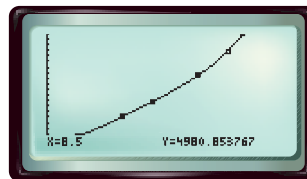
Travel Time (min)	1	2	5	7	10	12	13
Distance (km)	400	800	2500	3900	6250	8400	10,000

**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= 2nd F [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](http://www.algebra2.com/other_calculator_keystrokes)