ACTIVITY 9.3

Using Technology

Graphing Quadratic Curves of Best Fit

MATERIALS
CBL (optional)

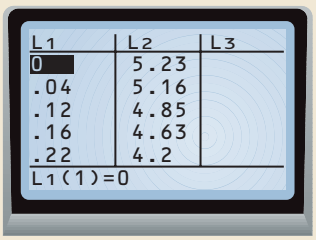
EXAMPLE

A falling object is dropped from a height of 5.23 feet. Using a CBL unit, the height of the object was recorded. Use a graphing calculator to find a quadratic model for the data.

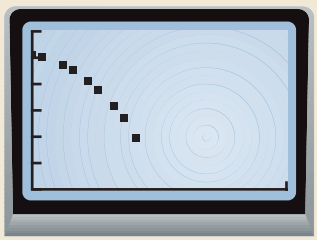
Time	0.0	0.04	0.12	0.16	0.22	0.26	0.32	0.36	0.41
Height	5.23	5.16	4.85	4.63	4.20	3.85	3.23	2.77	1.98

SOLUTION

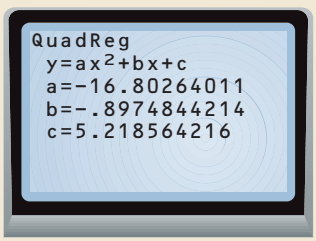
1 Let L_1 represent time (x) and L_2 represent height (y). Enter the ordered pairs.



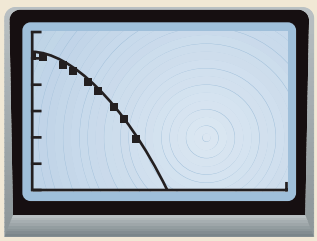
2 Set the viewing window so the range of x is from 0 to 1 and the range of y is from 0 to 6. Make a scatter plot.



3 Use quadratic regression to find a quadratic model. Approximate to the nearest hundredths place.



4 Graph the equation $y = -16.80x^2 - 0.90x + 5.22$ with the initial points.



From the scatter plot and the curve, you can see that the data appear to be part of a parabola that opens downward.

EXERCISES

In Exercises 1 and 2, find the best-fitting quadratic model for the points.

1. (1, 16), (3, 138), (5, 366), (7, 652), (9, 970), (11, 1310), (13, 1660)
2. (3.9, −2.8), (5.1, −8.2), (6.3, −16.3), (−3.1, −16.1), (−2.8, −8.9), (−1.3, −2.5), (0, 2), (1.8, 4.1), (2.7, 2.8)
3. If you have access to a CBL unit, collect data for three different falling objects such as a basketball, a baseball, and a table-tennis ball. Find a quadratic model for the height of each object. Are the values of a very different for different objects?

STUDENT HELP

INTERNET KEYSTROKE HELP

Visit our Web site www.mcdougallittell.com for information on using a CBL to collect your own data.