

Technology Activity

(Use with Lesson 6-3)

Finding Regression Lines

You can use a TI-83 to find the regression line for a set of data.

Example

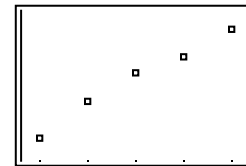
The table at the right shows the weight of first-class mail delivered annually by the U.S. Postal Service. Make a scatter plot of the data, and, if appropriate, find the equation of the regression line for these data. Predict the weight of first-class mail in the year 2000.

Weight of First-Class Mail
(millions of pounds)

Year	Weight
1992	3496.5
1993	3672.2
1994	3780.9
1995	3865.0
1996	3989.6

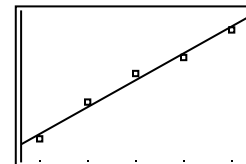
Source: U.S. Postal Service

Clear all lists. Then enter the year data into L1 and the weight data into L2 by pressing **STAT** 1. To make a scatter plot, press **2nd** **STAT PLOT** 1. Turn the plot on and highlight the scatter plot type. Enter L1 as the Xlist and L2 as the Ylist. Then press **ZOOM** 9 to select ZoomStat. This automatically selects appropriate window settings to show the data being plotted. These data appear to have a strong positive correlation. Therefore, a regression line is appropriate for these data.



Enter: **STAT** **▶** 4 **2nd** **L1** **,** **2nd** **L2** **,** **VARS** **▶** 1 1 **ENTER**

The regression equation is stored as Y1 on the Y=list. The screen displays the equation $y = ax + b$ and gives the values $a = 117.9$ and $b = -231331.76$. To graph the data with the regression line, press **GRAPH**.



The regression line seems to fit the data well. The regression equation predicts that in the year 2000, the United States Postal Service will deliver 4468.24 million pounds of first-class mail.

Use the Internet to find a set of data with a strong linear correlation. Then use a graphing calculator to answer each question.

1. Make a scatter plot of your data. Describe the pattern of the points in the scatter plot. Is the correlation positive or negative?
2. Find the regression equation for your data. Explain the meaning of your regression equation.
3. Find the r value of your data.
4. Graph the regression equation with your data. How well do you feel the graph of the equation fits the data?
5. Use your regression equation to make a prediction.

Internet Sites

Some of the following government Internet sites may be useful in your search for data.

Census Bureau: <http://www.census.gov>
 CIA: <http://www.odci.gov/cia>
 Dept. of Agriculture: <http://www.usda.gov>
 Dept. of Commerce: <http://www.doc.gov>
 Dept. of Education: <http://www.ed.gov>
 Bureau of Transportation Statistics:
<http://www.bts.gov>
 U.S. Treasury: <http://www.ustreas.gov>
 U.S. Postal Service: <http://www.usps.gov>