

Chapter 7 Project ▶ Fitting Models to Data

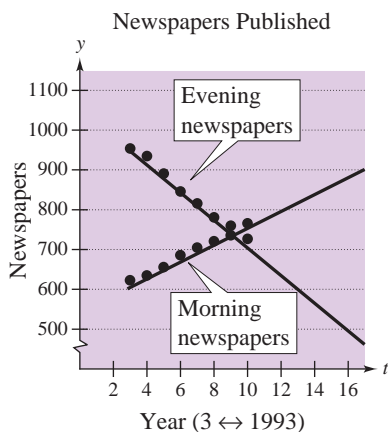
Many of the models in this book were created with a statistical method called *least squares regression analysis*. This procedure can be performed easily with a computer or graphing utility.

Example ▶ Fitting a Line to Data



The numbers of morning and evening newspapers published in the United States from 1993 through 2000 are shown in the table. Use the data to predict the numbers of morning and evening newspapers that will be published in 2005. In the table, $t = 3$ represents 1993. (Source: Editor and Publisher Company)

Year, t	3	4	5	6	7	8	9	10
Morning	623	635	656	686	705	721	736	766
Evening	954	935	891	846	816	781	760	727



Solution

Begin by finding a computer or graphing utility that will perform linear regression analysis. After entering the data and running the program, you should obtain the following models.

$$y = 20.5t + 558$$

Morning newspapers

$$y = -33.6t + 1057$$

Evening newspapers

With these models, you can predict the numbers of newspapers in 2005. If the trend continues to follow the pattern from 1993 through 2000, the numbers of newspapers in 2005 should be about

$$y = 20.5(15) + 558 \approx 866$$

Morning newspapers

$$y = -33.6(15) + 1057 = 553$$

Evening newspapers

The graphs of the data and the models are shown at the left.

Year, t	Morning
3	43.1
4	43.4
5	44.3
6	44.8
7	45.4
8	45.6
9	46.0
10	46.8

Chapter Project Investigations

- Use the models from the example to estimate the year in which the number of morning papers published was equal to the number of evening papers published.
- The total numbers (in millions) of *all* morning newspapers sold each day in the United States from 1993 to 2000 are shown in the table at the left. Find a linear model that represents this data. Use your model to predict the number of morning papers that will be sold each day in 2005.
- From 1993 through 2000, both the number of morning newspapers published and the total number of papers sold increased. Did the average circulation per morning paper (number sold \div number published) increase or decrease? Explain.