

87. **Make a Decision** The table shows the average undergraduate tuition, room, and board charges  $y$  (in dollars) at private institutions in the United States from 1985 to 2003. (*Data Source: U.S. Dept. of Education*)

| Year | Tuition, room, and board charges, $y$ |
|------|---------------------------------------|
| 1985 | 8202                                  |
| 1986 | 8885                                  |
| 1987 | 9676                                  |
| 1988 | 10,512                                |
| 1989 | 11,189                                |
| 1990 | 12,018                                |
| 1991 | 12,910                                |
| 1992 | 13,892                                |
| 1993 | 14,634                                |
| 1994 | 15,496                                |
| 1995 | 16,207                                |
| 1996 | 17,208                                |
| 1997 | 18,039                                |
| 1998 | 18,516                                |
| 1999 | 19,368                                |
| 2000 | 20,186                                |
| 2001 | 21,368                                |
| 2002 | 22,413                                |
| 2003 | 23,503                                |

- Use a graphing utility to plot the data. Let  $t$  represent the year, with  $t = 5$  corresponding to 1985. Describe the trend in the data.
- Use the technique demonstrated in Exercises 57–62 in Section 6.2 to set up a system of equations for the data. Let  $t$  represent the year, with  $t = 5$  corresponding to 1985.
- Solve the system from part (b) to find the least squares regression line  $y = at + b$ .
- Use a graphing utility to graph the least squares regression line from part (c) and the original data in the same viewing window. How well does the model fit the data? Explain your reasoning.
- Use the *regression* feature of a graphing utility to find a linear model for the data. How does this model compare with the model obtained in part (c).