Practice 4.2.4: Fitting Linear Functions to Data

Each of Mrs. Jackson's students records the number of hours he or she studied for a recent quiz. Mrs. Jackson then compared this time to the score earned by each student. Her data is in the table below. Use the data for problems 1–4.

Time studied, in hours	Score earned, out of 100
4.5	90
2.5	69
3	70
5	85
1	43
4.5	85
3.5	73
5	98
5	100
2	46
1.5	56
1.5	48
4	69

1. Create a scatter plot of the data set.

2. Describe the shape of the data.

3. Draw a line to estimate the data set.

4. Find the equation of the line that estimates the relationship between the hours studied and the score earned.

continued

A clothing store manager conducts research on how many articles of clothing each customer purchases. The manager is trying to understand if there is a relationship between the number of items tried on in the dressing room and the number of items purchased. The data for 10 customers is in the table below. Use the data for problems 5 and 6.

Number of items tried on	Number of items purchased
12	8
14	0
1	4
2	5
13	2
12	11
14	7
1	3
0	4
0	1

5. Create a scatter plot of the data set. Describe the shape of the data.

6. Can the data be represented using a linear equation? If yes, find the equation. If no, explain why not.

continued

To learn more about the relationship between years of schooling and yearly income, a company surveys 20 people with jobs. Each person identifies the number of years he or she attended school and his or her current yearly income. Use the data for problems 7 and 8.

Years of schooling	Income in dollars ($)
11	16,000
19	91,500
10	20,000
10	19,500
15	49,000
9	10,000
10	13,000
11	18,500
18	81,000
15	49,500
17	78,000
17	69,500
12	26,000
8	5,000
14	51,000
16	69,000
18	88,000
20	91,500
16	72,500
19	77,500

7. Create a scatter plot of the data set, and draw a line to fit the data.

8. Find the equation to estimate the relationship between years of schooling and income.

continued

The table below shows the cost of lunch at a high school each year for the last 10 years. Use the data for problems 9 and 10.

Year	Cost of lunch, in dollars ($)
1	1.10
2	1.20
3	1.31
4	1.43
5	1.54
6	1.64
7	1.75
8	1.89
9	2.01
10	2.12

9. Create a scatter plot of the data set, and draw a line to fit the data.

10. Find the equation to estimate the relationship between the year and the cost of lunch.