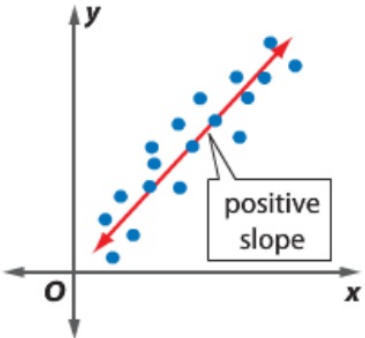
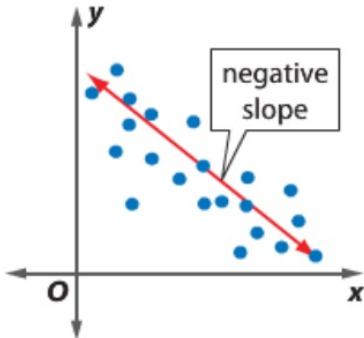
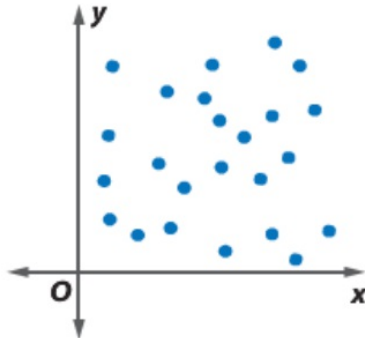


2-5 Scatter plots and Lines of Regression

KeyConcept Scatter Plots		
positive correlation	negative correlation	no correlation
		
Strong Positive Correlation The slope of the line is positive and the points are close to the line.	Weak Negative Correlation The slope of the line is negative and the points are not close to the line.	No Relative Correlation There is no obvious pattern of increase or decrease for the given data.

This will be asked in the chapter test.
You can relate this to the slope of the "prediction equation."

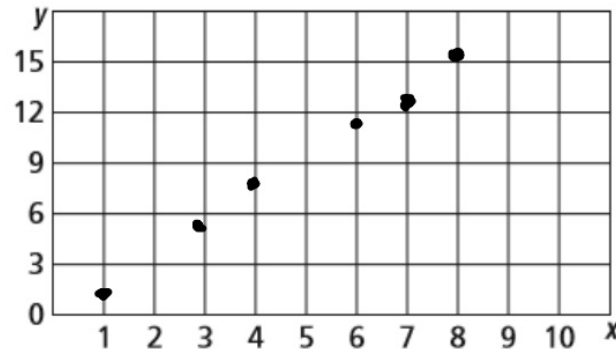
Scatter Plots and Lines of Regression

For Exercises 1–3, complete parts a–c.

- Make a scatter plot and a line of fit, and describe the correlation.
- Use two ordered pairs to write a prediction equation.
- Use your prediction equation to predict the missing value.

1.

x	y
1	1
3	5
4	7
6	11
7	12
8	15
10	?



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 1}{7 - 1} = \frac{11}{6} = m$$

$$y = mx + b$$

$$1 = \frac{11}{6}(1) + b$$

$$1 = \frac{11}{6} + b$$

$$-\frac{11}{6} \quad -\frac{11}{6}$$

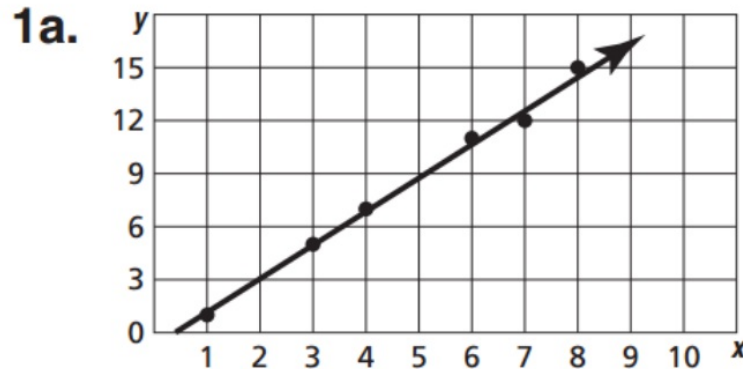
$$b = \frac{5}{6}$$

For Exercises 1–3, complete parts a–c.

- a. Make a scatter plot and a line of fit, and describe the correlation.
- b. Use two ordered pairs to write a prediction equation.
- c. Use your prediction equation to predict the missing value.

1.

x	y
1	1
3	5
4	7
6	11
7	12
8	15
10	?



Positive Correlation

$$y = \frac{11}{6}x - \frac{5}{6}$$

1b. Sample answer using (1, 1) and (8, 15) $y = 2x - 1$

1c. Sample answer: 19

Q: Which two points should you use?

A: Ideally, any two points. Just assume that there will be a margin of error, with our approach. The book tends to use the first and last point...

sample 1

For Exercises 3–6, complete parts a–c.

- a. Make a scatter plot and a line of fit, and describe the correlation.
- b. Use two ordered pairs to write a prediction equation.
- c. Use your prediction equation to predict the missing value.

3. **COMPACT DISC SALES** The table shows the number of CDs sold in recent years at Jerome’s House of Music. Let x be the number of years since 2000.

Year	2004	2005	2006	2007	2008	2017
Number of CDs sold	49,300	47,280	43,450	40,125	35,792	?

4. **BASKETBALL** The table shows the number of field goals and assists for some of the members of the Miami Heat in a recent NBA season. **4a. See margin.**

Field Goals	472	353	278	283	238	265	186	162	144
Assists	384	97	81	79	18	130	94	95	?

Source: NBA

3a. See margin.

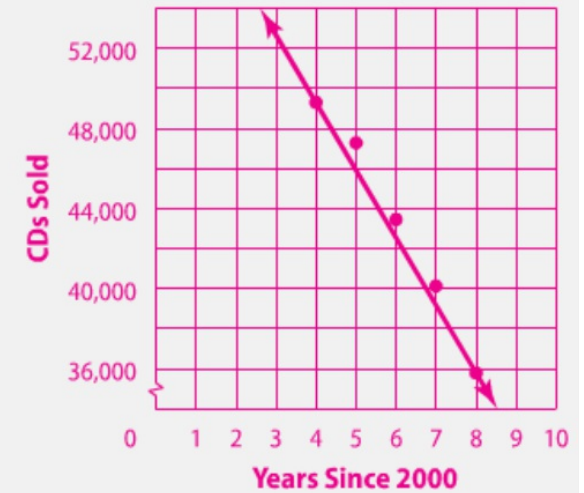
3b. Sample answer, using (4, 49,300) and (8, 35,792):
 $y = -3377x + 62,808$

3c. Sample answer: 5399 CDs

4b. Sample answer: No equation can be written because there is no correlation.

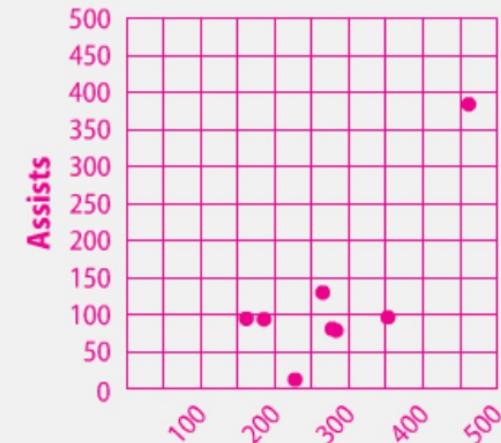
4c. unpredictable

3a. Compact Disc Sales



strong negative correlation

4a. 2006 Miami Heat



- 5 **ICE CREAM** The table shows the amount of ice cream Sunee's Homemade Ice Creams sold for eight months. Let $x = 1$ for January. **5a. See margin.** **5b. Sample answer using (1, 37) and (8, 131):**

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Gallons sold	37	44	72	80	105	110	119	131	?

$$y = \frac{94}{7}x + \frac{165}{7}$$

5c. Sample answer: about 144 gal

6. **DRAMA CLUB** The table shows the total revenue of all of Central High School's plays in recent school years. Let x be the number of years since 2003. **6a. See margin.** **6b. Sample answer using (2, 603) and (6, 771): $y = 42x + 519$**

School Year	2005	2006	2007	2008	2009	2016
Revenue (\$)	603	666	643	721	771	?

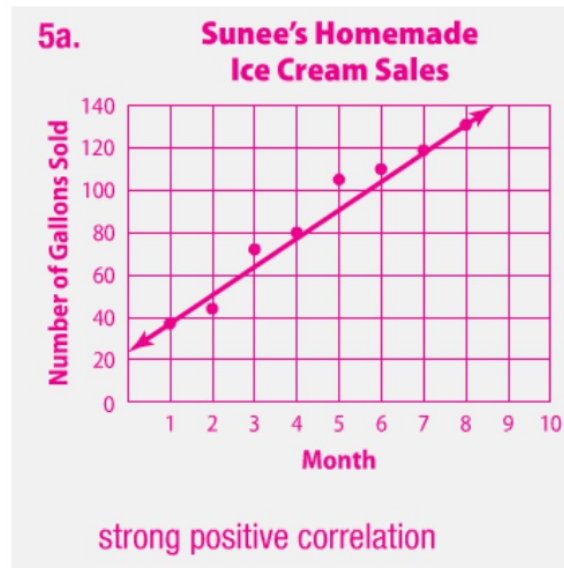
6c. Sample answer: \$1065

Example 2

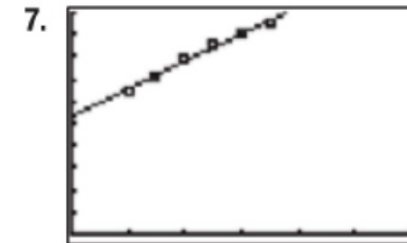
7. **SALES** The table shows the sales of Chayton's Computers. Let x be the number of years since 2002 and use a graphing calculator to make a scatter plot of the data. Find an equation for and graph a line of regression. Then use the function to predict the sales in 2018.

Year	Sales (\$ thousands)
2004	640
2005	715
2006	791
2007	852
2008	910
2009	944

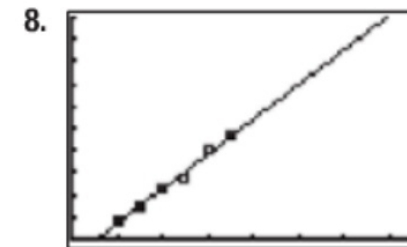
See Chapter 2 Answer Appendix for graph; $y = 61.9x + 530.2$; \$1.52 million in sales



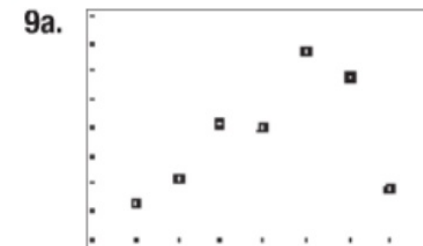
Lesson 2-5



[0,12] scl: 2 by [0, 1000] scl: 100



[0,15] scl: 2 by [0, 50] scl: 5



[2002, 2010] scl: 1 by [1,600,000, 2,400,000] scl: 100,000

