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Date:

Instructor:

Section:

Section 2.6 Interpreting Data: Linear Models

Learning Objective

1. Use a graphing utility to find a linear equation that models data.

Vocabulary

Use the choices to complete each statement.

correlation coefficient **linear regression** **regression analysis**

1. _____ is the process of fitting a line or curve to a set of data points.
2. The _____ indicates how well the regression equation fits the data. It is the r value calculated here.
3. _____ is the process of modeling data with a linear equation that best fits the data.

Objective 1

Solve.

4. Use the equation $y = 25.638237x + 12.491827$ to respond.
 - a. Compute the y -value when $x = 3$. Round the result to two decimal places.
4a. _____
 - b. If the equation represents the number of passengers (in hundreds) flying on a certain airline from San Francisco to Chicago each week x years after 1990, then estimate the number of passengers flying that airline each week from San Francisco to Chicago in 1993.
4b. _____

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5. Use the equation $y = -4.7461879x + 36.982317$ to respond.

a. Compute the y -value when $x = 5$. Round the result to two decimal places.

5a. _____

b. If the equation represents the number of orangutans living in a certain city's zoo x years after 2000, then estimate the number of orangutans living in that city's zoo in 2005.

5b. _____

Solve. Round the values in each regression equation to three decimal places.

6. The table below shows the price of a parking ticket in a certain city where x represents the number of years since 1980.

<i>Year</i>	<i>Parking Ticket Cost (dollars)</i>
1980	12
1985	16
1995	20
2005	24

Find a linear regression equation that fits the data.

6. _____

7. The table below shows the annual price for pet food for a certain type of pet where x represents the number of pounds the pet weighs and y represents the annual food cost.

<i>Weight of Pet (pounds)</i>	<i>Annual Pet Food Cost (dollars)</i>
10	250
15	425
25	610
32	725

Find a linear regression equation that fits the data.

7. _____

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8. Students at a particular college report they spend more on cell phone usage than in the past.

<i>Years after 2000 (x)</i>	2	4	6	7
<i>Annual Amount Spent for Cell Phone Services (y)</i>	\$275	\$371	\$510	\$545

- a. Use linear regression to find an equation that fits the data.

8a. _____

- b. What does the slope of the line indicate in this situation?

8b. _____

- c. If the amount spent continues to increase at the same rate, predict the amount spent per cell phone in the year 2016, rounded to the nearest dollar.

8c. _____



9. Given the following data for four houses sold in comparable neighborhoods and their corresponding number of square feet, find a linear regression equation representing a relationship between the number of square feet and the selling price of the house.

<i>Square Feet</i>	1519	2593	3005	3016
<i>Selling Price</i>	\$91,238	\$220,000	\$254,000	\$269,000

9. _____

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10. The average top ticket price for Broadway musicals increased dramatically between 1975 and 2003.



<i>Year</i>	1975	1985	1998	2000	2003
<i>Average Ticket Price</i>	13.76	45.26	73.03	118.89	130.50

a. Using the data in the table, find the regression equation that best fits the data. (Let x represent the number of years since 1970.)

10a. _____

b. Predict the average top price for Broadway musicals in the year 2013 if the trend continues to increase at the same rate.

10b. _____

c. Find the rate at which the cost is rising.

10c. _____

Challenge Problem

11. Would the data below be suitable for a linear regression? Explain your reasoning.

<i>Side of cube (x)</i>	1	2	4	5	10
<i>Volume ($V = x^3$)</i>	1	8	64	125	1000

11. _____