Scatterplots 1-4

I can identify independent (x) and dependent (y) variables to correctly set up a scatterplot in the calculator.

I can generate a correlation coefficient (r) using the calculator.

I can create a linear regression equation from a table of data.

I can use the linear regression equations to make predictions for new data.

The trend line that shows the relationship between two sets of data most accurately is the line of best fit. A graphing calculator compares the equation of the line of best fit using a model called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The graphing calculator also gives you the ­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(r), which tells you how closely the equation models the data.

Example:

r = .999\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ r = -.925\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

r = -.825\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ r = - .09 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

r = .363\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ r = .752\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calculator Reminder

In the **Lists & Spreadsheet** application, enter lists of equal length into two columns. Press menu and choose Statistics | Stat Calculations | Linear Regression (mx + b). Select the appropriate variables for “X List,” “Y List,” and the column where you want to store the results, and press “ok”. The correlation value, r, will be displayed with the other information.

Use your calculator to make a scatter plot of the given data. Then answer the following questions.

|  |  |
| --- | --- |
| **x** | **y** |
| .9 | 3 |
| 2.5 | 2.2 |
| 2.9 | 2.8 |
| 4 | 4 |
| 5.1 | 5 |
| 6 | 6 |
| 7.2 | 7 |
| 7.9 | 5.9 |

A) 1. Create a scatterplot on your calculator.

2. Do you see a positive, negative or no correlation? \_\_\_\_\_\_\_\_\_\_\_

3. What is the correlation coefficient? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Does this indicate a strong correlation? \_\_\_\_\_\_

Explain your reasoning.

5. Use the calculator to find slope (m)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Use the calculator to find the y-intercept (b):\_\_\_\_\_\_\_\_\_

7. Write the linear regression equation in slope intercept form. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Use your linear regression equation to predict what the y value would be when x is 3.

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| **x** | **y** |
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Use your calculator to make a scatter plot of the given data. Then answer the following questions.

The Boston Marathon has been run each year since 1897. The number of entrants (in thousands) every five years since 1975 is shown.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 |
| Entrants | 2.395 | 5.417 | 5.594 | 9.412 | 9.416 | 17.815 | 20.453 |

1. What is the independent variable? (x) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the dependent variable? (y) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Create a scatterplot on your calculator.
4. Do you see a positive, negative or no correlation? \_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is the correlation coefficient? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Does this indicate a strong correlation? \_\_\_\_\_\_Explain your reasoning.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Use the calculator to find slope (m)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Use the calculator to find the y-intercept (b):\_\_\_\_\_\_\_\_\_
3. Write the linear regression equation in slope intercept form.

10. Use your equation to predict the number of entrants in 2003. Show your work below.

11. Use your equation to predict about when the Boston Marathon reached 10.0 thousand entrants. Show your work below.

A lakeside campground kept a record of the number of campsites rented over the week that includes July 4 for several years.

**CAMPSITES RENTED JULY 4TH WEEK**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
| Sites Rented | 34 | 45 | 42 | 53 | 58 | 47 |

1. What is the independent variable? (x) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the dependent variable? (y) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Create a scatterplot on your calculator.
4. Do you see a positive, negative or no correlation? \_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is the correlation coefficient? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Does this indicate a strong correlation? \_\_\_\_\_\_Explain your reasoning.

7. Use the calculator to find slope (m)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Use the calculator to find the y-intercept (b):\_\_\_\_\_\_\_\_\_

9. Write the linear regression equation in slope intercept form.

10. Use your equation to determine when the campsite will rent 65 campsites. Show your work below.

11. Use your equation to determine the number of campsites that will be rented in 2020. Show your work below.

The prices of the eight top-selling brands of jeans at Jeanie’s Jeans are given in the table below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sales Rank | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Price ($) | 43 | 44 | 50 | 61 | 64 | 135 | 108 | 78 |

1. What is the independent variable? (x) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the dependent variable? (y) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Create a scatterplot on your calculator.

4. Do you see a positive, negative or no correlation? \_\_\_\_\_\_\_\_\_\_\_\_\_

5. What is the correlation coefficient? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Does this indicate a strong correlation? \_\_\_\_\_\_Explain your reasoning.

7. Use the calculator to find slope (m)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Use the calculator to find the y-intercept (b):\_\_\_\_\_\_\_\_\_

9. Write the linear regression equation in slope intercept form.

10. According to the equation, what would be the price of a pair of the 12th best-selling brands of jeans? Show your work below.

11. Is this a reasonable prediction? Explain.