

Practice 11

Given the linear correlation coefficient r and the sample size n , determine the critical values of r and use your finding to state whether or not the given r represents a significant linear correlation. Use a significance level of 0.05.

- 1) $r = 0.71, n = 25$ 1) _____
 A) Critical values: $r = \pm 0.487$, no significant linear correlation
 B) Critical values: $r = \pm 0.487$, significant linear correlation
 C) Critical values: $r = \pm 0.396$, significant linear correlation
 D) Critical values: $r = \pm 0.396$, no significant linear correlation

- 2) $r = -0.466, n = 15$ 2) _____
 A) Critical values: $r = \pm 0.514$, significant linear correlation
 B) Critical values: $r = \pm 0.514$, no significant linear correlation
 C) Critical values: $r = \pm 0.532$, no significant linear correlation
 D) Critical values: $r = 0.514$, no significant linear correlation

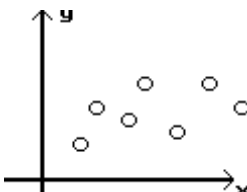
Construct a scatterplot for the given data.

3)

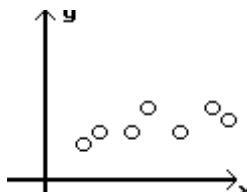
x	2	-7	-2	-8	-9	2	-4	8	-4	-1
y	-3	-7	-2	4	3	2	1	5	-7	-5

Determine which scatterplot shows the strongest linear correlation.

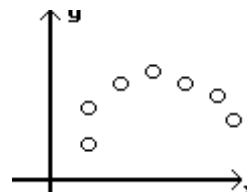
- 4) Which shows the strongest linear correlation? 4) _____
- A)



B)



C)



Find the value of the linear correlation coefficient r .

- 5)

x	19.3	23.4	10.3	17.7	23.2
y	6	2	3	3	3

5) _____
 A) -0.084 B) 0.094 C) -0.094 D) 0

- 6) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test. 6) _____

Hours	5	10	4	6	10	9
Score	64	86	69	86	59	87

- A) 0.678 B) 0.224 C) -0.678 D) -0.224

- 7) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 7) _____
- | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|
| Cost | 9 | 2 | 3 | 4 | 2 | 5 | 9 | 10 |
| Number | 85 | 52 | 55 | 68 | 67 | 86 | 83 | 73 |
- A) 0.235 B) 0.246 C) -0.071 D) 0.708

- 8) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters): 8) _____
- | | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|----|
| Temp | 62 | 76 | 50 | 51 | 71 | 46 | 51 | 44 | 79 |
| Growth | 36 | 39 | 50 | 13 | 33 | 33 | 17 | 6 | 16 |
- A) 0.256 B) -0.210 C) 0.196 D) 0

Suppose you will perform a test to determine whether there is sufficient evidence to support a claim of a linear correlation between two variables. Find the critical values of r given the number of pairs of data n and the significance level α .

- 9) $n = 6, \alpha = 0.05$ 9) _____
 A) $r = 0.811$ B) $r = \pm 0.811$ C) $r = \pm 0.917$ D) $r = 0.878$

Use the given data to find the best predicted value of the response variable.

- 10) Four pairs of data yield $r = 0.942$ and the regression equation $\hat{y} = 3x$. Also, $\bar{y} = 12.75$. What is the best predicted value of y for $x = 5.8$? 10) _____
 A) 0.942 B) 2.826 C) 17.4 D) 12.75
- 11) Six pairs of data yield $r = 0.444$ and the regression equation $\hat{y} = 5x + 2$. Also, $\bar{y} = 18.3$. What is the best predicted value of y for $x = 5$? 11) _____
 A) 93.5 B) 27 C) 4.22 D) 18.3
- 12) Eight pairs of data yield $r = 0.708$ and the regression equation $\hat{y} = 55.8 + 2.79x$. Also, $\bar{y} = 71.125$. What is the best predicted value of y for $x = 9.9$? 12) _____
 A) 83.42 B) 71.13 C) 57.80 D) 555.21
- 13) The regression equation relating dexterity scores (x) and productivity scores (y) for the employees of a company is $\hat{y} = 5.50 + 1.91x$. Ten pairs of data were used to obtain the equation. The same data yield $r = 0.986$ and $\bar{y} = 56.3$. What is the best predicted productivity score for a person whose dexterity score is 37? 13) _____
 A) 58.20 B) 56.30 C) 76.17 D) 205.41
- 14) Nine pairs of data yield $r = 0.867$ and the regression equation $\hat{y} = 19.4 + 0.93x$. Also, $\bar{y} = 64.7$. What is the best predicted value of y for $x = 48$? 14) _____
 A) 79.6 B) 57.8 C) 64.7 D) 64
- 15) Based on the data from six students, the regression equation relating number of hours of preparation (x) and test score (y) is $\hat{y} = 67.3 + 1.07x$. The same data yield $r = 0.224$ and $\bar{y} = 75.2$. What is the best predicted test score for a student who spent 5 hours preparing for the test? 15) _____
 A) 75.2 B) 78.1 C) 72.7 D) 59.7

Use the given data to find the equation of the regression line. Round the final values to three significant digits, if necessary.

16) $\frac{x}{y} \left| \begin{array}{cccccc} 1 & 3 & 5 & 7 & 9 \\ 143 & 116 & 100 & 98 & 90 \end{array} \right.$ 16) _____
 A) $\hat{y} = -150.7 + 6.8x$ B) $\hat{y} = 140.4 - 6.2x$
 C) $\hat{y} = 150.7 - 6.8x$ D) $\hat{y} = -140.4 + 6.2x$

17) $\frac{x}{y} \left| \begin{array}{ccccc} 1.2 & 1.4 & 1.6 & 1.8 & 2.0 \\ 54 & 53 & 55 & 54 & 56 \end{array} \right.$ 17) _____
 A) $\hat{y} = 54$ B) $\hat{y} = 50.4 + 2.50x$ C) $\hat{y} = 50 + 3x$ D) $\hat{y} = 55.3 + 2.40x$

18) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) when they entered the program were between 3.5 and 4.0. The following data were obtained regarding their GPAs on entering the program versus their current GPAs. 18) _____

Entering GPA	Current GPA
3.5	3.6
3.8	3.7
3.6	3.9
3.6	3.6
3.5	3.9
3.9	3.8
4.0	3.7
3.9	3.9
3.5	3.8
3.7	4.0

A) $\hat{y} = 3.67 + 0.0313x$ B) $\hat{y} = 5.81 + 0.497x$
 C) $\hat{y} = 2.51 + 0.329x$ D) $\hat{y} = 4.91 + 0.0212x$

19) Two different tests are designed to measure employee productivity and dexterity. Several employees are randomly selected and tested with these results. 19) _____

Productivity	23	25	28	21	21	25	26	30	34	36
Dexterity	49	53	59	42	47	53	55	63	67	75

A) $\hat{y} = 2.36 + 2.03x$ B) $\hat{y} = 10.7 + 1.53x$
 C) $\hat{y} = 75.3 - 0.329x$ D) $\hat{y} = 5.05 + 1.91x$

20) $\frac{x}{y} \left| \begin{array}{cccc} 2 & 4 & 5 & 6 \\ 7 & 11 & 13 & 20 \end{array} \right.$ 20) _____
 A) $\hat{y} = 0.15 + 2.8x$ B) $\hat{y} = 3.0x$ C) $\hat{y} = 0.15 + 3.0x$ D) $\hat{y} = 2.8x$