

ch12 practice test

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank.

- 1) The null hypothesis that  $x$  and  $y$  are \_\_\_\_\_ is  $H_0: \beta = 0$ . 1) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Select the most appropriate answer.

- 2) When a two-sided significance test about a population slope has a P-value below 0.05, the 95% confidence interval for  $\beta$  2) \_\_\_\_\_
- A) does contain the true slope.
  - B) does not contain zero.
  - C) does not contain the estimated slope.
  - D) does contain zero.
  - E) may or may not contain zero.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank.

- 3) A(n) \_\_\_\_\_ analysis is used to describe and to make inferences about the relationship between two quantitative variables. 3) \_\_\_\_\_
- 4) The \_\_\_\_\_ equation is often called a \_\_\_\_\_ equation, because substituting a particular value of  $x$  into the equation provides a prediction for  $y$  at that value of  $x$ . 4) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Select the most appropriate answer.

- 5) A regression analysis investigates the relationship between 5) \_\_\_\_\_
- A) a quantitative explanatory variable and a quantitative response variable.
  - B) a quantitative explanatory variable and a qualitative response variable.
  - C) a qualitative explanatory variable and a quantitative response variable.
  - D) a qualitative explanatory variable and a qualitative response variable.
  - E) None of the above.
- 6) To determine whether or not it is sensible to do a regression analysis, look at 6) \_\_\_\_\_
- A) the slope.
  - B) a scatterplot.
  - C) the  $y$ -intercept.
  - D) the squared correlation.
  - E) the correlation.

Provide an appropriate response.

- 7) Hi-Tech Agri Inc wants to determine if the rainfall in inches can be used to predict the yield per acre on a corn farm. Identify the explanatory variable. 7) \_\_\_\_\_
- A) farm
  - B) variety of corn grown
  - C) yield per acre
  - D) Hi-Tech Agri Inc
  - E) rainfall in inches

8) The data given are the gestation periods, in months, of randomly selected mammals and their corresponding life span, in years. 8) \_\_\_\_\_

Gestation	8	2.1	1.3	1	11.5	5.3	3.8	24.3
Life span	30	13	8	4	28	11	12	42

Identify the response variable

- A) Breed of mammal
- B) Life span
- C) Climate
- D) Gestation
- E) Month

9) Suppose you were to collect data for the pair of given variables in order to make a scatterplot. Determine for each variable if it is the explanatory variable or the response variable. 9) \_\_\_\_\_

Variables: Minutes of homework, grade on exam

- A) Minutes of homework: both  
Grade on exam: both
- B) Minutes of homework: response variable  
Grade on exam: explanatory variable
- C) Minutes of homework: explanatory variable  
Grade on exam: response variable
- D) Minutes of homework: explanatory variable  
Grade on exam: both
- E) Minutes of homework: both  
Grade on exam: response variable

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

Select true or false.

10) When the average of the x-values is used to predict y, the predicted value of y is always equal to the average of the y-values. 10) \_\_\_\_\_

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank.

11) The difference between an observed outcome and its predicted value is called a prediction error or a(n) \_\_\_\_\_. 11) \_\_\_\_\_

12) The regression line is also called the \_\_\_\_\_ line because it has a smaller sum of squared residuals than any other line. 12) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

13) The difference  $y - \hat{y}$  between an observed outcome y and its predicted value  $\hat{y}$  is called a/an \_\_\_\_\_ 13) \_\_\_\_\_

A) equation      B) mean      C) constant      D) slope      E) residual

Provide an appropriate response.

- 14) The relationship between the number of games won ( $x$ ) by a minor league baseball team and the average attendance ( $y$ ) at their home games is analyzed. The analysis found the model for attendance to be  $\hat{y} = -2600 + 225x$ . The Fayetteville Patriots won 44 times and averaged 14,393 fans at each game. Calculate the residual. 14) \_\_\_\_\_
- A) 7093 people  
B) 7300 people  
C) -2600 people  
D) -7093 people  
E) 14,381 people

- 15) The regression equation relating dexterity scores ( $x$ ) and productivity scores ( $y$ ) for the randomly selected employees of a company is  $\hat{y} = 5.50 + 1.91x$ . Find the estimated mean of the productivity scores for all those who had dexterity scores of  $x = 37$ . 15) \_\_\_\_\_
- A) 205.4                      B) 76.2                      C) 70.7                      D) 58.2                      E) 56.3

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

Select true or false.

- 16) The slope describes the strength of linear association. 16) \_\_\_\_\_
- 17) The correlation and the slope do not depend on the units of measurement. 17) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use technology to provide an appropriate response.

- 18) Managers rate employees according to job performance ( $x$ ) and attitude ( $y$ ). The results for several randomly selected employees are given below. Determine the slope of the regression line for this data. Round your answer to the nearest hundredth. 18) \_\_\_\_\_

x	59	63	65	69	77	76	69	70	64	58
y	72	67	78	82	87	92	83	87	78	75

- A) 1.02                      B) -1.25                      C) 1.35                      D) 2.02                      E) 11.7

- 19) Find the equation of the regression line for the given data. Round your answer to three decimal places. 19) \_\_\_\_\_

x	-5	-3	4	1	-1	-2	0	2	3	-4
y	-10	-8	9	1	-2	-6	-1	3	6	-8

- A)  $\hat{y} = 2.097x - 0.552$   
B)  $\hat{y} = 0.522x + 2.097$   
C)  $\hat{y} = 0.522x - 2.097$   
D)  $\hat{y} = 2.097x + 0.552$   
E)  $\hat{y} = -0.552x + 2.097$

Provide an appropriate response.

- 20) In an area of the South, records were kept on the relationship between the rainfall (in inches) and the yield of cotton (bushels per acre). The equation of the least squares regression line is found to be  $\hat{y} = 4.267 + 4.379x$ . Use the regression line to predict the yield of cotton for an area with a rainfall of 10 inches. 20) \_\_\_\_\_

Rain fall (in inches), x	10.5	8.8	13.4	12.5	18.8	10.3	7.0	15.6	16.0
Yield (bushels per acre), y	50.5	46.2	58.8	59.0	82.4	49.2	31.9	76.0	78.8

- A) 45 bushels per acre
- B) 47 bushels per acre
- C) 31 bushels per acre
- D) 50 bushels per acre
- E) 48 bushels per acre

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank.

- 21) The \_\_\_\_\_ is a standardized version of the slope. 21) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Select the most appropriate answer.

- 22) The strength of a linear association is described by 22) \_\_\_\_\_
- A) the y-intercept.
  - B) a response variable.
  - C) the correlation.
  - D) the explanatory variable.
  - E) the slope.

- 23) The regression of y on x has a prediction equation of  $\hat{y} = -2.0 + 5.0x$  and a correlation of 0.3. Then, the regression of x on y 23) \_\_\_\_\_
- A) could have a negative slope.
  - B) has  $r^2 = \sqrt{0.3}$ .
  - C) also has a y-intercept of -2.0.
  - D) also has a correlation of 0.3.
  - E) has a correlation of -0.3.

Provide an appropriate response.

- 24) Fast food is often considered unhealthy because much fast food is high in both fat and sodium. Using the table below find the correlation between fat and sodium. Round your answer to three decimals places. 24) \_\_\_\_\_

Fat in grams (x)	19	31	34	35	39	39	43
Sodium in milligrams (y)	920	1500	1310	860	1180	940	1260

- A) 0.199
- B) 0.335
- C) 0.040
- D) -0.199
- E) 0.210

## Answer Key

Testname: CH12PRAC

- 1) statistically independent
- 2) B
- 3) regression
- 4) regression; prediction
- 5) A
- 6) B
- 7) E
- 8) B
- 9) C
- 10) TRUE
- 11) residual
- 12) least squares
- 13) E
- 14) A
- 15) B
- 16) FALSE
- 17) FALSE
- 18) A
- 19) A
- 20) E
- 21) correlation
- 22) C
- 23) D
- 24) A