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Chapter 10 Test



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DIRECTIONS: For this multiple-choice test, select the most appropriate answer for each statement or question.

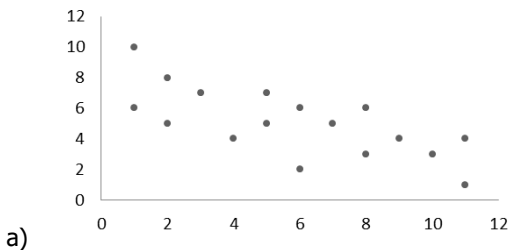
1. The relationship between two quantitative variables is also known as bivariate analysis.
 - a) True
 - b) False

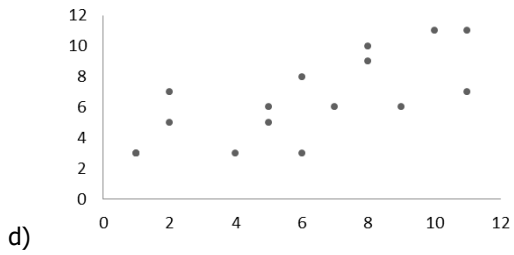
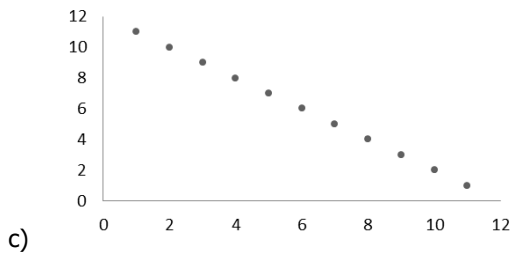
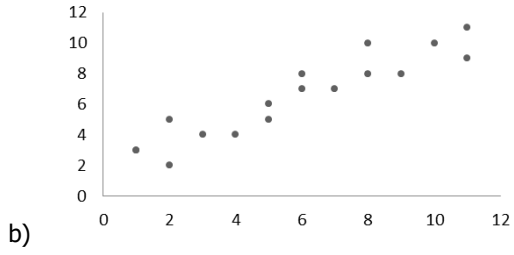
2. A _____ is used to show the relationship between two quantitative variables.
 - a) pareto chart
 - b) histogram
 - c) scatterplot
 - d) ogive

3. The correlation coefficient is a value which represents the strength and direction of the linear relationship between two quantitative variables. What is the official name of r , the correlation coefficient?
 - a) Euclid's correlation coefficient
 - b) Tukey's correlation
 - c) Einstein's correlation coefficient
 - d) Pearson product moment correlation coefficient



4. Researchers would like to use the weight of a car to predict its miles per gallon. Which variable is the response variable?
- The cars
 - Miles per gallon
 - The researchers
 - Weight of the car
5. A medical doctor would like to use a patient's weight to predict his/her body mass index (BMI). Which variable is the explanatory variable?
- The medical doctor
 - Body mass index
 - The patients
 - The patient's weight
6. Which scatterplot has a perfect negative correlation?





7. The correlation coefficient, r , is used to measure linear relationships.
- a) True
 - b) False
8. If the value of the correlation coefficient, r , is greater than 0.75, the variables have a strong negative linear relationship.
- a) True
 - b) False
9. Which of the following is not a valid value for the correlation coefficient, r ?
- a) -0.72
 - b) 0.36
 - c) 1.2
 - d) -1
10. If $r = 1$, it means there is a _____ positive linear relationship between x and y . If $r = -1$, it means there is a _____ negative linear relationship between x and y .
- a) weak
 - b) moderate
 - c) modest
 - d) perfect



11. Statements involving causation should be avoided in correlation analysis.
- a) True
 - b) False
12. Which of the following represents the population correlation coefficient?
- a) σ
 - b) ρ
 - c) Σ
 - d) Δ
13. Is there a significant linear relationship between x and y ? Test at the 1% level of significance and state the conclusion.

x	10	14	16	28
y	8	10	18	32

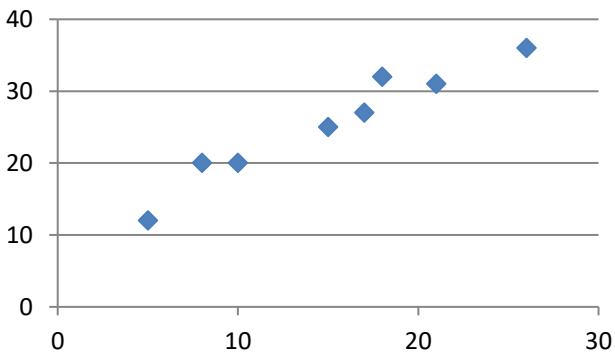
- a) There is a linear relationship between x and y .
 - b) There is not a linear relationship between x and y .
14. Regression analysis should only be used if the linear relationship is determined to be statistically significant.
- a) True
 - b) False



15. The _____ of the residuals of a least-squares regression line is equal to 0.
- a) variance
 - b) standard deviation
 - c) mean
 - d) range
16. In regression analysis, _____ means minimizing the sum of the squared residuals.
- a) least-cubes
 - b) most-cubes
 - c) most-squares
 - d) least-squares
17. Determine the equation of the least-squares regression line given the following statistics:
- Mean of $x = 66$
Mean of $y = 10$
Standard deviation of $x = 4$
Standard deviation of $y = 2$
 $r = 1$
- a) $\hat{y} = -23 + 0.5x$
 - b) $\hat{y} = 23 + 0.5x$
 - c) $\hat{y} = 23 - 0.5x$
 - d) $\hat{y} = -23 - 0.5x$



18. What is the equation of the least-squares regression line that corresponds to the following scatterplot?



- a) $\hat{y} = -9.15 + 1.08x$
b) $\hat{y} = -9.15 - 1.08x$
c) $\hat{y} = 9.15 + 1.08x$
d) $\hat{y} = 9.15 - 1.08x$
19. The equation for a least-squares regression line is the following: $\hat{y} = 2.3x + 61$. What is the slope?
- a) 0.94
b) 0.97
c) 61
d) 2.3
20. If $\hat{y} = 60 + 10x$, determine the predicted y-value given $x = 25$.
- a) 1750
b) 200
c) 25
d) 310



21. A track and field coach wanted to determine if the leg length (in inches) of an athlete corresponded to the distance jumped (in feet) in the long jump competition. The equation of the least-squares regression line is the following: $\hat{y} = 3.5 + 0.31x$. Use the equation of the least-squares regression line to predict the distance jumped in the long jump competition for an athlete who has a leg length of 32 inches.
- 15.4 ft.
 - 12.23 ft.
 - 13.42 ft.
 - 10.1 ft.
22. Extrapolation is a practice in which one uses x-values that are beyond the range of the observed x-values of the data set to make predictions.
- True
 - False
23. The coefficient of determination is the percent of the _____ that is explained by the least-squares regression line.
- variation in x
 - variation in y
 - variation in xy
 - variation in z
24. Given $r = 0.92$, what would be the value of the coefficient of determination?
- 0.6147
 - 0.9200
 - 0.8464
 - 0.2133

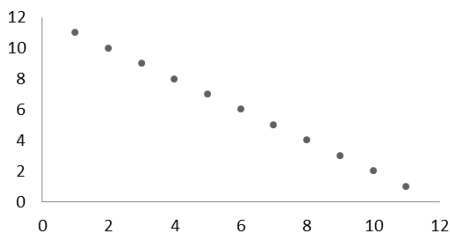


25. The standard error of estimate is the _____ of the observed y-values about the predicted y-value for a specific x-value.
- a) mean
 - b) median
 - c) variance
 - d) standard deviation



Answers

1. True
2. Scatterplot
3. Pearson product moment correlation coefficient
4. Miles per gallon
5. The patient's weight



- 6.
7. True
8. False
9. 1.2
10. Perfect
11. True
12. ρ
13. There is not a linear relationship between x and y .
14. True
15. Mean
16. Least-squares
17. $\hat{y} = -23 + 0.5x$
18. $\hat{y} = 9.15 + 1.08x$
19. 2.3
20. 310
21. 13.42 ft.
22. True
23. Variation in y
24. 0.8464
25. Standard deviation

