9.1 review

Name_____

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

Solve the problem.

1) The simple Linear model is given by the equation 1) _____

A) $\hat{y}=a+bx$

B) $y - y_i = m(x - x_i)$

C) $y = \beta_0 + \beta_1 x +$

D) $y_i = \frac{A_i}{B_i} x_i + C_i$

2) When constructing a confidence interval about the slope, the t-distribution is used with _____ degrees of freedom. 2) _____

A) $n - 1$ B) $n_1 + n_2 - 2$ C) $n - 2$ D) $n + k - 2$

Computer output from a regression analysis is provided.

The regression equation is Y = 72.9 - 0.519 X

Predictor	Coef	SE Coef	T	P
Constant	72.909	2.037	35.79	0.000
X	-0.5195	0.1946	-2.67	0.008

3) What is the sample slope for this model? 3) _____

A) **72.909** B) **2.037** C) -0.5195 D) **0.1946**

4) What is the sample intercept for this model? 4) _____

A) **2.037** B) **72.909** C) **0.1946** D) -0.5195

5) What is the standard error of sample slope? 5) _____

A) **72.909** B) -0.5195 C) **0.1946** D) **2.037**

6) What is the p-value for testing if the slope in the population is different from zero? 6) _____

A) **0.1946** B) **0.000** C) 0.5195 D) **0.008**

7) The sample size in this situation is $n = 157$. What are the degrees of freedom for constructing a confidence interval for, or performing a test about, the population slope? 7) _____

A) **157** B) **156** C) **155** D) 153

8) The sample size in this situation is $n = 157$. Construct a 95% confidence interval for the population slope. find $t^* = ?$ 8) _____

A) **2.037** B) -1.654 C) **1.654** D) **1.975**

9) The sample size in this situation is $n = 157$. Construct a 95% confidence interval for the population slope. 9) _____

A) **(-0.7029, -0.1561)** B) **(-0.8396, -0.1994)**
C) **(-0.8029, -0.1461)** D) **(-0.9038, -0.1352)**

10) Use the p-value for testing if the slope in the population is different from zero (and a 5% significance level) to make a clear conclusion about the effectiveness of the model 10) _____

A) There is insufficient evidence that the population slope differs from zero, and thus is an not effective model for predicting this response variable
B) There is very strong evidence that the population slope differs from zero, and thus is an effective model for predicting this response variable
C) There is very strong evidence that the population slope differs from zero, and thus is an not effective model for predicting this response variable
D) There is insufficient evidence that the population slope differs from zero, and thus is an effective model for predicting this response variable)

The correlation between GPA and number of Facebook friends is -0.386. sample size n=30. Use the correlation , at the 2% significance level, test for a linear association between GPA and number of Facebook friends. Include all details of the test.

11) State the null and alternative hypotheses. 11) _____

A) $H_0: \rho < 0$ $H_a: \rho = 0$
B) $H_0: \rho = 0$ $H_a: \rho < 0$
C) $H_0: \rho = 0$ $H_a: \rho > 0$
D) $H_0: \rho = 0$ $H_a: \rho \neq 0$

12) Find test statistic. 12) _____

A) t = 5.003 B) t = -2.214 C) Z = 2.150 D) t = 2.081

13) Find P-value 13) _____

A) 0.0230 B) 0.0560 C) 0.0176 D) 0.0351

14) What is conclusion,at the 2% significance level? 14) _____

A) Reject Ho B) Do not reject Ho

15) Is the correlation significant? 15) _____

A) Yes B) No

Test for evidence of a positive linear association using the sample correlation r=0.68 and the sample size n=10.

16) State the null and alternative hypotheses. 16) _____

A) $H_0: \rho = 0$ $H_a: \rho < 0$
B) $H_0: \rho = 0$ $H_a: \rho \neq 0$
C) $H_0: \rho < 0$ $H_a: \rho = 0$
D) $H_0: \rho = 0$ $H_a: \rho > 0$

17) Find test statistic. 17) _____

A) t = -2.216 B) t = 2.387 C) t = 2.579 D) t = 2.623

18) Find P-value 18) _____

A) 0.9847 B) 0.0153 C) 0.0305 D) 0.0412

19) What is conclusion,at the 2% significance level? 19) _____

A) Do not reject Ho B) Reject Ho

20) Is the correlation significant? 20) _____

A) No B) Yes

Data were collected on the age (in years) and price (in thousands of dollars) of a random sample of 25 used Honda Civic. A scatterplot of the data (with regression line) and computer output from a regression analysis are provided:

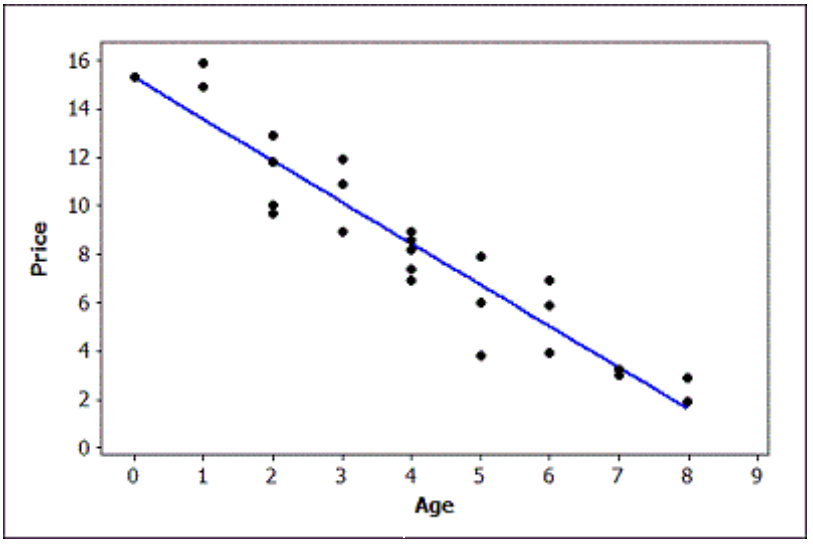
Pearson correlation of the age (in years) and price (in thousands of dollars) =

P-Value =

The regression equation is Price = 15.3 - 1.71 Age

Predictor	Coef	SE Coef	T	P
Constant	15.2912	0.5840		
Age	-1.7126	0.1264		

S = 1.37179 R-Sq = 88.9% R-Sq(adj) = 88.4%



21) Use the scatterplot to determine whether we should have any serious concerns about the conditions being met for using a linear model with these data 21) _____

A) The conditions for using a linear model are not meet, there is curved patten

B) The conditions for using a linear model are not meet, there is fanning pattern

C) There are no concerns

D) The conditions for using a linear model are not meet, there are outliers

22) Based on the available information, what is the correlation between age and price (in thousands of dollars) of used Honda Civic 22) _____

A) 0.889 B) 0.943 C) -0.943 D) -0.889

23) Based on the available information, what is the test statistic for correlation between age and price (in thousands of dollars) of used Honda Civic 23) _____

A) 26.18 B) -13.50 C) -13.59 D) 0.943

24) What is the p-value for testing the correlation between age and price (in thousands of dollars) of used Honda Civic 24) _____

A) 0.050 B) 0.000 C) 0.010 D) 0.020

25) What is the conclusion of testing the correlation between age and price (in thousands of dollars) of used Honda Civic 25) _____

A) We do not reject H_0 and find evidence of a linear relationship between age and price (in thousands of dollars) of used Honda Civic

B) We do not reject H_0 and do not find evidence of a linear relationship between age and price (in thousands of dollars) of used Honda Civic

C) We reject H_0 and find evidence of a linear relationship between age and price (in thousands of dollars) of used Honda Civic

D) We reject H_0 and do not find evidence of a linear relationship between age and price (in thousands of dollars) of used Honda Civic

26) Use the equation of the least squares line to predict the price of a used Honda Civic that is 6 years old 26) _____

A) $5040 B) $5.040 C) $81.54 D) $8154

27) What is the estimated slope for this model? 27) _____

A) -1.7126 B) 15.2912 C) 0.5840 D) 0.1264

28) Interpret the slope of the least squares line. 28) _____

A) For each additional year of age, the predicted price of the car (used Honda) decreases by 1.71 thousand dollars ($1,710).

B) For each additional year of age, the predicted price of the car (used Honda) increases by 1.71 thousand dollars ($1,710).

C) For each additional year of age, the predicted price of the car (used Honda) increases by 15.3 thousand dollars .

D) For New Car, the predicted price of the car will be $15291

29) Use the computer output to test the slope to determine whether *age* is an effective predictor of *price*. State the null and alternative hypotheses. 29) _____

A) $H_0: \beta_0 = 0$ $H_a: \beta_0 \neq 0$

B) $H_0: \beta_1 = 0$ $H_a: \beta_1 < 0$

C) $H_0: \beta_1 = 0$ $H_a: \beta_1 \neq 0$

D) $H_0: \beta_1 = 0$ $H_a: \beta_1 > 0$

30) What is test statistic to test the slope to determine whether *age* is an effective predictor of *price*. 30) _____

A) 0.5840 B) 26.18 C) 0.1264 D) -13.55

31) What is the p-value for a test of the slope? 31) _____

A) 0.0500 B) 0.0200 C) 0..0100 D) 0.0000

32) What is the conclusion of testing the slope between age and price (in thousands of dollars) of used Honda Civic 32) _____

A) We reject H_0 . There is very strong evidence that age is an effective predictor of price of used Honda Civic

B) We do not reject H_0 and do not find evidence that age is an effective predictor of price of used Honda Civic

C) We do not reject H_0. There is very strong evidence that age is an effective predictor of price of used Honda Civic

D) We reject H_0 and do not find evidence that age is an effective predictor of price of used Honda Civic

33) What is the relationship between the p-value of the correlation test and the p-value of the slope test? 33) _____

A) They are the same. B) They are different.

34) What are the degrees of freedom for constructing a confidence interval for, or performing a test about, the population slope? 34) _____

A) 25 B) 24 C) 23 D) 22

35) To construct a 90% confidence interval for the population slope. find t^* = ? 35) _____

A) 1.708 B) 1.714 C) 1.711 D) 1.319

36) What is stand error of the slope? 36) _____

A) -13.55 B) 26.18 C) 0.5840 D) 0.1264

37) Construct a 90% confidence interval for the population slope. 37) _____

A) (-1.8006, -1.4706) B) (-1.989, -1.454)

C) (-0.8396, -0.1994) D) (-1.929 , -1.496)

38) Interpret the 90% confidence interval for the population slope. 38) _____

A) We are 90% sure that for each additional year of age, the cost of Honda Civic in this sample decreases by between 1.496 and 1.929 thousand dollars ($1,496 and $1,929)

B) We are 90% sure that for each additional year of age, the predicted cost of Honda Civic decreases by between 1.496 and 1.929 thousand dollars ($1,496 and $1,929)

C) 90% of Honda Civic in this sample will decreases by between 1.496 and 1.929 thousand dollars ($1,496 and $1,929)

39) What is the R^2 for this mode? 39) _____

A) 94.3% B) 26.18% C) 88.9% D) 58.40%

40) Interpret the R^2 for this mode 40) _____

A) The age of the cars explains about 89% of the variability in the prices of the cars in this sample

B) the prices of the cars explains about 89% of the variability in the age of the cars in this sample

C) The age of the cars explains about 94% of the variability in the prices of the cars in this sample

D) the prices of the cars explains about 58% of the variability in the age of the cars in this sample

Solve the problem.

41) The _____ measures the percentage of total variation in the response variable that is explained by the least squares regression line. 41) _____

A) Coefficient of linear correlation
B) Sum of the residuals squared
C) Slope of the regression line
D) Coefficient of determination

42) The coefficient of determination is the _____ of the linear correlation coefficient. 42) _____

A) Opposite
B) Reciprocal
C) Square root
D) Square

43) Each year a nationally recognized publication conducts its "Survey of America's Best Graduate and Professional Schools." 43) _____

An academic advisor wants to predict the typical starting salary of a graduate at a top business school using GMAT score of the school as a predictor variable. A simple linear regression of SALARY versus GMAT using 25 data points shown below.

$b_0 = -92040$ $b_1 = 228$ $s = 3213$ $R^2 = .66$ $r = .81$ $df = 23$ $t = 6.67$

Give a practical interpretation of $R^2 = .66$.

A) We estimate SALARY to increase $.66 for every 1-point increase in GMAT.
B) We can predict SALARY correctly 66% of the time using GMAT in a straight-line model.
C) 66% of the sample variation in SALARY can be explained by using GMAT in a straight-line model.
D) We expect to predict SALARY to within $2\left[\sqrt{.66}\right] = \$1{,}620$ of its true value using GMAT in a straight-line model.