ARIZONA STATISTICS · UNIT 4 · 25 QUESTIONS

Regression and Experiments — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The regression line is ŷ = 2x + 5. The predicted value of y when x = 10 is**



ANSWER _____

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2 **The regression line is ŷ = 3x - 2. The predicted value of y when x = 7 is**

ANSWER _____

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3 **For the line $\hat{y} = 4x + 1$, the slope means that each increase of 1 in x is associated with an increase of 4 in the predicted y. This is**



A True

B False

C Only for x = 0

D Only for large x

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4 For the line $\hat{y} = 10 - 2x$, the intercept 10 is the predicted y when x equals

- **A** 10
- **B** 2
- **C** 0
- **D** -2

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5 An observed value is 30 and the predicted value is 27. What is the residual?

ANSWER _____

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6 An observed value is 42 and the predicted value is 38. What is the residual?

ANSWER _____

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7 **Which correlation coefficient shows the strongest linear relationship?**



A -0.41

B 0.62

C -0.92

D 0.79

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8 A scatter plot has correlation r = 0.91. This describes a

Question 8

A scatter plot has correlation $r = 0.91$. This describes a

A) Strong positive linear relationship

B) Weak positive linear relationship

C) Strong negative linear relationship

D) No linear relationship

- A Strong positive linear relationship
- B Weak positive linear relationship
- C Strong negative linear relationship
- D No linear relationship

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9 If r = 0.8, then r² is

ANSWER _____

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10 **If r = -0.9, then r^2 is**

ANSWER _____

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11 **The value of r^2 tells roughly what percent of the variation in y is explained by the linear relationship with x. This is**

A True

B False

C Only for r = 1

D Only for negative r

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12 **The least squares line is chosen to minimize the sum of squared**

- A Observed values
- B Predicted values
- C Residuals
- D Slopes

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13 **The regression line always passes through the point**

- A With the largest x
- B With the largest y
- C Of the means of x and y
- D At the origin

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14 The slope is $b = r\, s_y/s_x$. With $r = 0.6$, $s_y = 10$, $s_x = 5$, the slope is

ANSWER _____

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15 The slope is $b = r\, s_y/s_x$. With $r = 0.5$, $s_y = 8$, $s_x = 4$, the slope is

ANSWER _____

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16 Using a regression line far outside the range of the data is called

A. Interpolation

B. Extrapolation

C. Correlation

D. Confounding

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17 **A strong association between two variables does NOT by itself prove**



A Correlation

B Association

C Causation

D Prediction

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18 **A variable that affects both the explanatory and response variables and may explain their association is called a**

A Lurking variable

B Response variable

C Explanatory variable

D Residual

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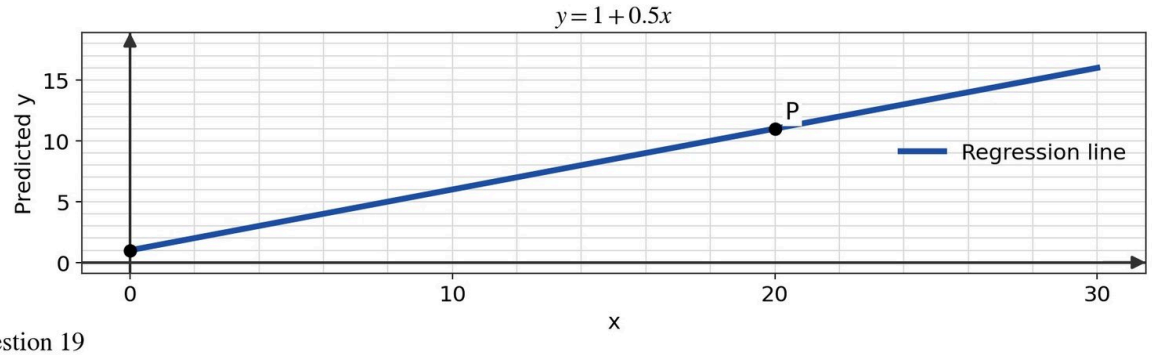
19 **The graph shows a regression line. The predicted value when x = 20 is**



Question 19

The graph shows a regression line. The predicted value when $x = 20$ is

A) 9

B) 11

C) 13

D) 21

A 9

B 11

C 13

D 21

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20 **In an experiment, the researcher deliberately changes the**

- A Response variable
- B Explanatory variable
- C Lurking variable
- D Confounding variable

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21 **In an observational study, the researcher does NOT**

- A Collect data
- B Assign treatments
- C Record outcomes
- D Compare groups

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22 **Randomly assigning subjects to treatments helps to balance out**

A Lurking variables

B Sample size

C Response variables

D Measurement error only

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23 **A control group in an experiment is used to**



A Increase the sample size

B Provide a baseline for comparison

C Hide the treatment

D Remove all variation

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24 **In an experiment, one group receives a treatment that looks real but has no active ingredient. The researchers include this group to control for the**

- A Placebo effect
- B Sample size
- C Confounding only
- D Random assignment

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25 **In a double blind experiment, neither the subjects nor the people measuring outcomes know who got which treatment. This reduces**

- A Sample size
- B Bias
- C Variation
- D Correlation

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ANSWER KEY

1.	25	**10.**	0.81	**19.**	B
2.	19	**11.**	A	**20.**	B
3.	A	**12.**	C	**21.**	B
4.	C	**13.**	C	**22.**	A
5.	3	**14.**	1.2	**23.**	B
6.	4	**15.**	1	**24.**	A
7.	C	**16.**	B	**25.**	B
8.	A	**17.**	C		
9.	0.64	**18.**	A		

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