

AP Statistics - Inference for the Slope of a Regression Line - Quiz

Common Core AP STAT 9.1, AP STAT 9.2, AP STAT 9.3, AP STAT 9.4, AP STAT 9.5, AP STAT 9.6, HSS-ID.B.6 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Ten multiple-choice questions test the conditions, the degrees of freedom, and reading regression output. Read each explanation carefully before continuing.

AP Statistics · Common Core State Standards: **AP STAT 9.1, AP STAT 9.2, AP STAT 9.3, AP STAT 9.4, AP STAT 9.5, AP STAT 9.6, HSS-ID.B.6**

Questions

Question 1

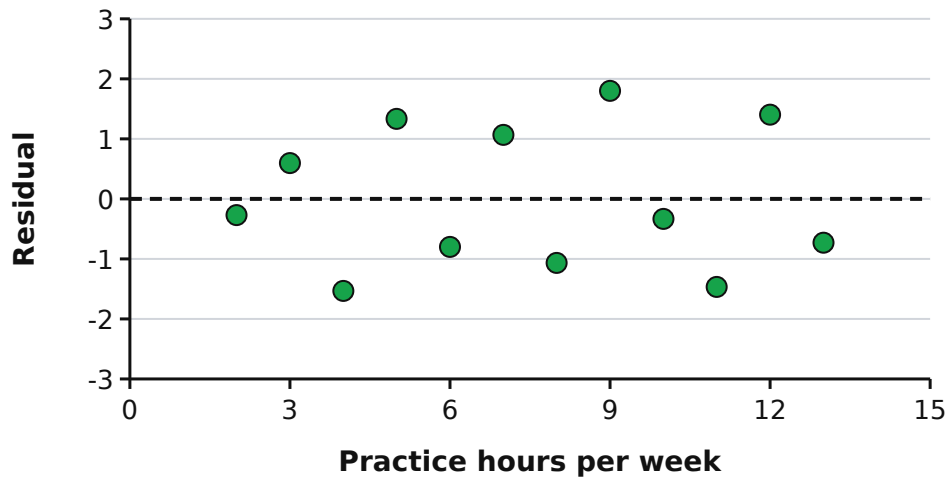
Predictor	Coef	SE Coef	T	P
Constant	0.267	0.489	0.55	0.615
x	1.686	0.126	13.42	0.0002
S = 0.526	R-Sq = 97.8%			

Regression output.

What is the standard error of the slope in this output?

- A. 1.686
- B. 0.126
- C. 0.526
- D. 0.267

Question 2

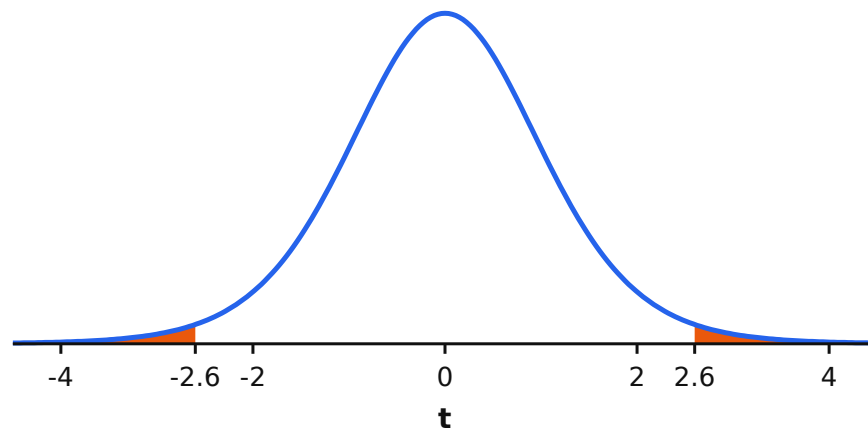


No pattern in the residuals and roughly constant spread: a linear model is appropriate.

This residual plot supports which condition?

- A. Normal only
- B. Independent only
- C. Random sampling only
- D. Linear and equal variance

Question 3



Two-sided p-value.

The two-sided p-value is closest to:

- A. 0.026
- B. 0.013
- C. 0.5
- D. 0.974

Question 4

The degrees of freedom for a t procedure for a slope with $n = 20$ are:

- A. 20
- B. 19
- C. 17
- D. 18

Question 5

A 95% interval for beta is (0.4, 1.2). Which is correct?

- A. The relationship is zero
- B. There is convincing evidence of a positive linear relationship
- C. There is a 95% chance that $\beta = 0.8$
- D. The slope is certainly 0.8

Question 6

In the LINER conditions, 'E' stands for:

- A. Equal variance
- B. Error
- C. Exponential
- D. Estimate

Question 7

A researcher wants to test whether a linear relationship exists. The null hypothesis is:

- A. $\beta = 0$
- B. $\beta = 1$
- C. $r = 1$
- D. $b = 0$

Question 8

A two-sided P value of 0.08 from the output. For $H_a: \beta > 0$ with a positive slope, the p-value is:

- A. 0.08
- B. 0.04
- C. 0.16
- D. 0.92

Question 9

The SE of the slope is 0.5 and $b = 2$. The t statistic for $H_0: \beta = 0$ is:

- A. 1
- B. 0.25
- C. 4
- D. 2.5

Question 10

A curved pattern in the residual plot means:

- A. the Random condition fails
- B. the slope is zero
- C. the Linear condition fails
- D. the sample is too large

Answers

1. **B** - The SE Coef column of the row for the explanatory variable gives SE_b. The Coef column gives the slope itself.
2. **D** - No curve and constant spread support the Linear and Equal variance conditions.
3. **A** - The tail beyond 2.6 with $df = 10$ is 0.0133, doubled is 0.027.
4. **D** - $df = n - 2 = 18$.
5. **B** - 0 is not in the interval and all values are positive.
6. **A** - Equal variance means the spread of residuals is constant across x.
7. **A** - H_0 states that the true slope is 0, which means no linear relationship.
8. **B** - Halve the two-sided p-value because the sample slope is in the direction of H_a .
9. **C** - $t = b/SE_b = 2/0.5 = 4$.
10. **C** - A curve means a straight line is not an appropriate model.

Remember

- Parameter: true slope β ; statistic: sample slope b ; $df = n - 2$.
- Interval: $b \pm t^* SE_b$; test: $t = (b - 0)/SE_b$ for $H_0: \beta = 0$.
- LINER: Linear, Independent, Normal residuals, Equal variance, Random.
- Computer output gives b , SE_b , t , and the two-sided P in the row for the explanatory variable.
- If the interval contains 0, there is no convincing evidence of a linear relationship.