Section 4 & 5: Hypothesis Testing, Confidence Intervals, Regression

Quiz:

1. For any given data set and sampling situation, is a 95% confidence interval wider than a 99% confidence interval?
   A. yes
   B. no

   Answer: No, as alpha decreases the confidence interval widens due to z_alpha/2 and as alpha increases, confidence interval shrinks and beta decreases (Type II) since less likely to reject

2. Assume that you are an emergency paramedic called in to rescue victims of an accident. You need to help a patient who is bleeding profusely. The patient is also considered to be at a high risk for having the HIV virus. Assume that the null hypothesis is that the patient does not have the HIV virus. A Type I error is: “We conclude that the patient _____ have the HIV virus when, in fact, the patient _____ .”

   A. does not, does

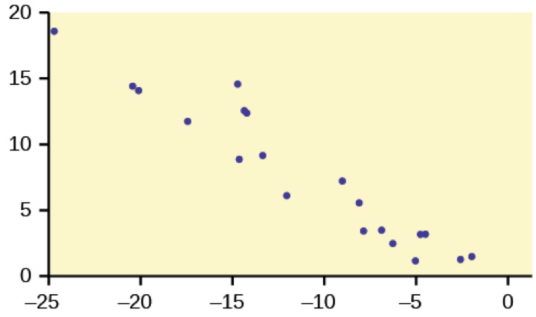
   B. does, does not

   C. may not, may

   D. may, may not

   Answer B, reject H0 when it is true

3. Describe the pattern in the scatter plot in Figure 2, and decide whether the X and Y variables would be good candidates for linear regression.



   A. The X and Y variables have a strong positive linear relationship.

   B. The X and Y variables have a strong negative linear relationship.

C. The X and Y variables have a strong nonlinear relationship.

D. The X and Y variables do not have a clear relationship.

Answer: B

A study relating the grams of potassium (Y) to the grams of fiber (X) per serving in enriched flour products (bread, rolls, etc.) produced the equation: $\hat{y}=25+16x$

4. For a product with five grams of fiber per serving, what are the expected grams of potassium per serving?

A. 105
B. 25
C. 5
D. 16

ANSWER: 105
EXPLANATION: $\hat{y}=25+16(5)=105$