1. Which of the following is NOT one of the four assumptions in a simple linear regression model.

- The pairs are independent of each other.
- The variance of the responses is constant.
- The values of the explanatory variable have a normal distribution.
- The data is linear.

2. The principle of least squares produces an estimated regression line such that the sum of all squared vertical distances is a minimum.

- True
- False

3. In a simple linear regression model, all of the points lie on the estimated regression line.

- True
- False

4. The coefficient of determination is defined as _____ . I want the formula for how it is calculated, not the symbol.

5. The coefficient of determination measures the proportion of the average response that is explained by the regression model.

- True
- False

6. A scatter plot should be considered prior to finding an estimated regression line because

- **a.** it is necessary to be sure that the linear model is reasonable.
- **b.** the regression line is determined directly from the plot.
- **c.** it is common practice so everyone expects that it be done.
- **d.** There is no reason to consider a scatter plot prior to estimating the regression line.

7. In the following situation, choose which is the explanatory variable and which is the response variable.
The amount of alcohol that a person drinks and their physical reaction time.

- The amount of alcohol is the explanatory variable and the reaction time is the response variable.
- Both variables are indistinguishable with regard to their response-explanatory characteristics.
- The amount of alcohol is the response variable and the reaction time is the explanatory variable.

Would you expect the relationship to be positive or negative?

- positive
- negative

In the following situation, choose which is the explanatory variable and which is the response variable.
The amount of sugar added to a cup of coffee and how sweet the coffee tastes.

- The amount of sugar is the explanatory variable and the sweetness is the response variable.
- The amount of sugar is the response variable and the sweetness is the explanatory variable.
- Both variables are indistinguishable with regard to either response-explanatory characteristics.

Would you expect there relationship to be positive or negative?

- positive
- negative

8. Agricultural research suggests that the final corn yield in bushels per acre (y) is linearly related to the number of inches between rows (x). Suppose that the true regression line is y = 197.5 - 6.1 x.

Fill in the blank. (Give your answer to 1 decimal place .)
The final corn yield when the number of inches between the rows = 0 is _____ bushels per acre.
Does this value make sense?

- Yes
- No

Agricultural research suggests that the final corn yield in bushels per acre (y) is linearly related to the number of inches between rows (x). Suppose that the true regression line is y = 197.5 - 6.1 x.

Fill in the blank. (Give your answer to 1 decimal place .)
The expected yield when there are 15 inches between rows is ___

Agricultural research suggests that the final corn yield in bushels per acre (y) is linearly related to the number of inches between rows (x). Suppose that the true regression line is y = 197.5 - 6.1 x.

Fill in the blank. (Give your answer 1 decimal place .)
The change in yield that is expected if the distance between rows decreases by 2 inches is ___

9. A recent study suggests that the number of steps walked per day is strongly associated with good health. A person's heart rate indicates how hard the heart is working to circulate blood throughout the body and is a measure of health. A lower resting heart rate may reduce the risk of heart attack and stroke, and also increase endurance. A random sample of adults between 35 and 40 years old was obtained, and each person wore a pedometer for a day. The number of steps taken, x, was recorded, and the next day the resting pulse rate (beats/minute), y, for each person was also measured. The summary statistics are:
n = 18, S_{XX} = 51,475,597, S_{YY} = 273.7778, S_{XY} = -69,436.4, $\bar{x}$=4636.7778, $\bar{y}$=69.8889

Find the estimated regression line. (4 decimal places)
$\hat{y}$ = _____ + _____ x

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Fill in the following ANOVA table. The degrees of freedom are integers and the rest of the entries should have 2 decimal places.

Source of Error	Sum of Squares	Degrees of Freedom	Mean Square
Regression	___	__	____
Error	____	__	____
Total	____	__	

The estimated variance is ____ . (2 decimal places)

The proportion of the variance in the resting pulse rate that is explained by the number of steps the previous day is _____ . (4 decimal places)