Date _____ Period _____

<u>Chapter 10 Final Exam Review</u> <u>Correlation and Regression</u>

1. You are given a set of data consisting of hours of sleep and math test scores. As hours of sleep increase, the math test scores tend to increase. If you find the linear correlation coefficient r to be 0.92, what could you say about the relationship of the data values?

- a. Strong negative linear correlation
- b. Strong positive linear correlation
- c. Weak negative linear correlation
- d. No linear correlation

2. Based on 7 pairs of sample data, the regression equation relating percent change in the rate of violent crime (x) and percent change in the rate of imprisonment (y) is $\hat{y} = -3.311 + 0.129x$. From the same data, you find the linear correlation coefficient r = 0.083 and the mean of the percent change in imprisonment rates $\bar{y} = -2.486$. What is the best prediction for the percent change in the rate of imprisonments if you know that the rate of violent crimes has changed by 4.2%?

- a. -2.486
- b. 6.386
- c. 0.083
- d. 0.129
- 3. Choose the error in the stated conclusion:

Given: There is a correlation between the number of pages of notes you've taken in math class and your math average.

Conclusion: The number of pages of notes you've taken in math class causes your math average to rise.

a. Data based on averages b. Property of linearity c. Correlation implied causality

4. Campus security at Ohio State analyzed 20 pairs of sample data from the past 20 years in order to study the relationship between the number of students enrolled and the number of burglaries on campus. The linear correlation coefficient r was found to be 0.753. Assuming a significance level of 0.05, what <u>critical value(s)</u> should be used to determine if there is sufficient evidence to support the claim that there is a linear relationship between the number of students enrolled and the number of burglaries on campus?

- a. 0.444
- b. ±0.444
- c. 0.456
- d. ±0.456

5. An scientist is studying the number of times a cricket chirps per minute (x) and the temperature in degrees Fahrenheit (y). Use the following sample data to answer questions a-e and round your final answers to the *hundredths place* if necessary.

х	882	1188	1104	864	1200	1032	960	900
у	69.7	93.3	84.3	76.3	88.6	82.6	71.6	79.6

a. Construct a scatter plot (by hand) to display the relationship between x and y.



b. Find the linear correlation coefficient for the given sample data.

c. State whether there exists a positive, negative, or no correlation at the 0.01 significance level. (Hint: Be sure to follow the steps to conduct a formal hypothesis test to determine if there is a linear correlation)

d. Find the equation for the regression line.

e. If a cricket chirps 922 times per minute, what is the best predicted temperature in degrees Fahrenheit?