Linear Regression Definitions and Concepts

1. What is the range of possible numbers for a correlation coefficient?

2. What is the range of possible numbers for the coefficient of determination?

3. If our correlation coefficient equals .78, what is our coefficient of determination? What if our correlation coefficient equals -.23?

4. Describe in words what the slope says about the relation between our x and y variable.

5. If our x variable represents people's heights and y is people's weights, and the smallest height in our data set in 58 inches and the largest height is 77 inches, why can't we use linear regression to predict the weight of a person who is 56 inches tall?

6. If our x variable represents number of wheels on an automobile and y is cost of tolls, why is the y-intercept in our least squares regression line not helpful to interpret?

7. Provide in words the definition of R-squared.

8. Draw two scatterplots, one for which r = 1 and a second for which r = -1.

9. What is wrong with the correlation r = 2.05?

10. For each of the following pairs of variables, indicate whether you would expect a positive correlation, a negative correlation, or a correlation close to 0. Explain your choice.
    a. Maximum daily temperature and cooling costs
    b. Interest rate and number of loan applications
    c. Height and IQ
    d. Height and shoe size
    e. Time spent on homework and time spent watching television during the same day by an elementary school student