Statistics Name _____

LSR Review #2

1. Netbooks are a hybrid of a laptop computer and a tablet. They are smaller and have better battery life than a traditional laptop. They also have a separate keyboard, unlike most tablets. *Consumer Reports* did a study of 22 netbooks in their February 2010 issue. Among the variables measured were battery life (hours), weight (pounds), and cost. The data appear in the table.

Battery life (hours)	**Weight (pounds)**	**Cost (dollars)**
6.00	2.8	370
7.75	2.9	350
7.25	2.8	330
5.50	2.4	370
8.25	2.9	360
9.50	2.9	400
7.75	2.9	340
7.75	2.7	340
8.00	2.8	350
7.00	2.8	350
6.50	3.2	360
6.25	2.7	310
5.25	2.9	330
5.00	2.7	320
3.75	2.6	380
4.50	2.8	335
2.75	2.4	350
2.75	2.4	300
2.50	2.6	280
2.50	2.5	500
2.00	2.5	290
2.75	2.5	500

a. If we want to use a linear model to predict battery life of a new netbook based on its cost, what is the explanatory variable and what is the response variable?
b. Make a scatterplot. Describe it.
c. Find the LSR. State what the slope and y-intercept mean in context to the data
d. List r. Interpret the meaning of the correlation in context to the data.
e. Calculate the residual for x = 310. Discuss what the value of the residual tells you about the point in relationship to the LSR line.
f. Predict the battery life if the netbook costs $600.
g. How reliable is your prediction? Is it appropriate to extrapolate here? Explain
h. Sketch the residual plot for this data. What does the plot tell you about the data?
i. Are there any outliers? If so, are they influential and how do you know?

2. Identify what is wrong with each of the following statements.

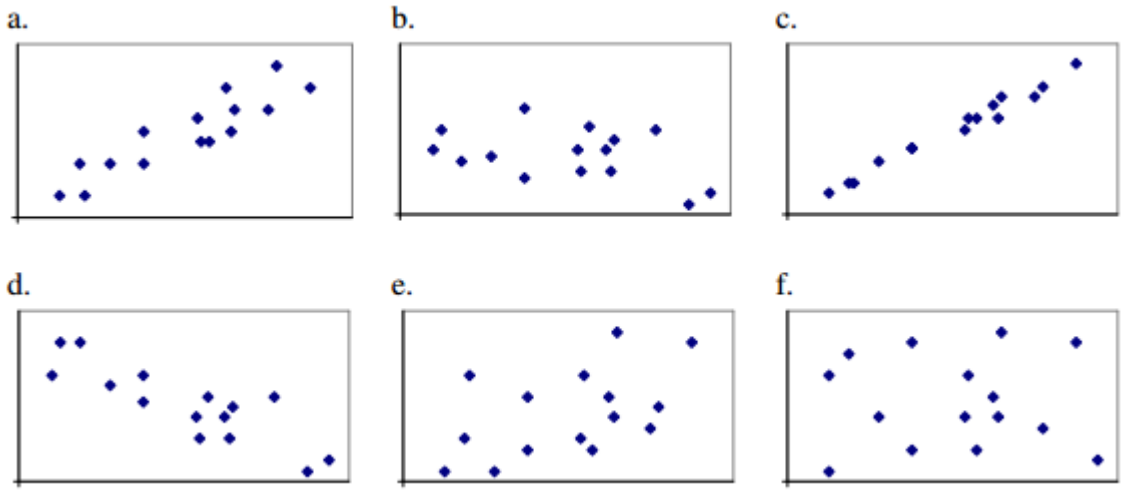
a. The correlation between tire pressure and gas mileage is 1.32.
b. The correlation between eye color and height is 0.34.
c. Since the correlation between the height and weight of this bird species is –0.31, a longer bird will weigh less than a shorter bird.

3. The mean height of married American women in their early twenties is 64.5 inches and the standard deviation is 2.5 inches. The mean height of married men the same age is 68.5 inches with standard deviation 2.7 inches. The correlation between the heights of husbands and wives is about r = 0.5

a. Find the equation of the least-squares regression line for predicting a husband's height from his wife's height for married couples in their early 20s. (Hint: Use the formula)

b. Suppose that the height of a wife was 1 standard deviation below average. Predict the height of her husband.

4. The correlation coefficients for the six scatter plots shown below are -0.85, -0.40, 0, 0.50, 0.90 and 0.99. Match each scatter plot with the correct correlation coefficient.



5. The correlation between Age and Income as measured on 100 people is r = 0.75. Explain whether or not each of these possible conclusions is justified:

a. When Age increases, Income increases as well.
b. The form of the relationship between Age and Income is straight.
c. There are no outliers in the scatterplot of Income vs. Age.
d. Whether we measure Age in years or months, the correlation will still be 0.75.

6. When using midterm exam scores to predict a student's final grade in a class, the student would prefer to have a (choose the best answer)

a. positive residual, because that means the student's final grade is higher than we would predict with the model.
b. positive residual, because that means the student's final grade is lower than we would predict with the model.
c. residual equal to zero, because that means the student's final grade is exactly what we would predict with the model.
d. negative residual, because that means the student's final grade is higher than we would predict with the model.