MTH 115 Practice Problems 4

1. To study the relationship between blood pressure and exercise, women who were fifty years of age were randomly selected and agreed to participate in a modest training program. Five women were included in the study and exercised daily for a predetermined amount of time. Let x = length of each workout (minutes) and y = systolic blood pressure (mm Hg) measured at the end of a sixty day period for each participant. The data are given in the following table:

x (min)	y (mm Hg)
5	145
25	140
30	130
10	145
45	120

a. Construct a scatterplot of the data.
b. Compute the sample correlation coefficient.
c. Do x and y have a positive or negative relationship? Please explain.

2. Refer to Problem 1 above.
a. Find the equation of the least-squares regression line.
b. Overlay the least-squares regression line on the scatterplot found in Problem 1.
c. Do the intercept and slope have meaningful interpretations in this problem? Please explain.
d. What is the predicted systolic blood pressure for a fifty year-old women who has a 20 minute daily workout routine?

3. Suppose an investigator recorded gender and systolic blood pressure for each person in a random sample of 200 people. Let x = gender and y = systolic blood pressure.

a. Is this an example of bivariate data?
b. Is the above data categorical? Please explain.
c. Describe how data the may appear on a (x, y) scatterplot.

4. To examine the shopping habits of consumers, a study was performed on the number of shoppers at Walmart, Kohl's, Home Depot, Target, and Best Buy at 8:00 am on the Friday after Thanksgiving. The sample results were as follows: 85, 50, 80, 77, and 56.

Test the null hypothesis, at $\alpha = 0.01$, that all five stores were equally popular.

5. Consider the data in Problem 4. Test the null hypothesis, at $\alpha = 0.05$, that Kohl's and Best Buy are equally popular and that Walmart, Home Depot, and Target had twice as many customers as Kohl's. State your conclusion in the context of the problem.