Math 160 H

FIRST HOUR EXAM

NAME_____

General Notes:

1. Show work.
2. Look over the test first, and then begin.
3. Calculators are permitted on this exam. You may carry out any calculations to the point at which you would need a calculator and then punch in the numbers except as noted.

Friday, February 19, 2010
100 pts.

I. Some definitions (5 pts. each) Give brief definitions of the following:

a. Explanatory variable

b. Distribution

c. Residual

d. Lurking variable

e. Outlier

II. General questions

1. Several of the questions below refer to the following data set of exam scores:

42 / 62 / 68 / 70 / 72 / 75 / 94

a. (5 pts.) Using the techniques in the book, find the five number summary for this dataset by hand. Please do not use a calculator, and show your work.

b. (10 pts.) Calculate the IQR for the distribution and use it to determine if 42 is or is not an outlier. Say why or why not 42 is an outlier.

c . (10 pts.) Calculate the average and standard deviation for this dataset. It will be sufficient to leave your standard deviation in the form of a final expression, so that all that needs to be done is to enter the numbers in the expression into a calculator. Writing down the formulas will be sufficient for some partial credit, but not full credit (by themselves). Please give the average as a number

d. (10 pts.) Suppose temperature data has been collected in Aberystwyth, Wales in degrees centigrade and an average and standard deviation of $\bar{x} = 10, s_x = 5$ calculated. We would like these figures in degrees Fahrenheit. Using the formula $F = \frac{9}{5}C + 32$, what is the average and standard deviation in degrees Fahrenheit?

III. Distributions

a. (5 pts.) What is the 68-95-99.7 rule for a normal distribution?

b. (5 pts.) (from example 1.27). The combined SAT scores is approximately normal with a mean of 1026 and standard deviation 209. Suppose a student has a combined SAT score of 1150. What is the corresponding z-score?

c. (5 pts.) Use table A to determine the percentage of the population has a combined SAT score of 1150 or above.

IV. Regression

a. (5 pts.) Write the formula for the correlation coefficient **r** between variables x and y, saying what the terms in the formula mean.

b. Suppose that we have $r = 0.5, \bar{x} = 1, \bar{y} = 3, s_x = 1, s_y = 4$.

1. (10 pts.) Write the equation of the least squares linear regression line as a numerical equation involving x and y, giving b_0 and b_1 as numbers.

(problem b continued)

2. (5 pts.) What would be the computed value for y if x=2?

3. (5 pts.) Why is it called a **least squares** regression line?