MATH 210 - Test #1 - 2/26/98
Show all work for full credit!

1. You survey 9 sophomores and 9 seniors, asking the question, "On average how many hours do you sleep at night?" The results are as follows:

SOPH. 4.5 5.5 5.7 6.4 6.6 6.7 7.4 7.8 8.6

SR. 6.2 6.6 7.2 7.4 7.4 7.6 7.8 8.0 8.4

a. Construct a back-to-back stemplot for these two sets of data.
[5]

b. Compare these two sets of data, including the *center* of each distribution, the amount of *variation* in each and the *symmetry* (this should be done visually -- you need not calculate anything!)
[5]

c. For the sophomore's data compute:
[12]

Mean

Median

Q_1

Q_3

d. Use the "IQR Test" to demonstrate that there are no outliers in the sophomore's data.
[5]

2. The test scores on the math SAT are normally distributed with a mean of 500 and a standard deviation of 100.

a. Give a range that contains the middle 95% of SAT math scores.

[7]

b. What percent of scores are *greater* than 625?

[7]

c. What percent of scores are *between* 375 and 625?

[7]

d. Determine the 30^{th} percentile for SAT math scores.

[7]

3. You wish to investigate the number of hours full-time Manchester students study per week. You stand outside the library on a Saturday morning and ask people going inside whether they are Manchester students. If they are students you ask, "How many hours do you study in a typical week?" You stop after you have received 30 answers. For this polling situation identify:

a. the population

[3]

b. the sampling frame (HINT: Who has a chance to be included in this poll?)

[3]

c. the sample

[3]

d. three possible sources of bias (Your answers must be specific to this situation and include an explanation of why this bias may occur.)

[9]

4. Miscellaneous

a. State three characteristics of any normal curve.

[6]

b. If you use the mean to measure the center of a distribution then you should use the _____ _____ as your measure of variation.

[3]

c. Are the two measures referred to in (b) resistant or not? **Explain your answer!**

[5]

d. Which of the following have the same units as the original data? (If you need an example consider Page 1. Circle all in the list that are correct.)

[5]

mean median interquartile range

variance standard deviation

e. In the United States men's heights are normally distributed with mean 69 inches and standard deviation 2.5. Suppose that in the nation of Jambaza men's height are also normal with mean 69 inches but with standard deviation of 3. **In which country is it more likely to find a man with a height over 72 inches?** (This question may be answered either with specific calculations **or** with a two- or three-sentence explanation.)

[5]

f. In a skewed left distribution which will be greater -- the mean or the median? **Explain!**

[5]