Stat 2216 Spring 2006
Statistical Methods R. Claycombe

First Exam

Write all answers in your blue book and show all work there. Return your exam and printout(s) in your blue book.

14 pts.

1) The "outcomes" committee asks every senior to complete a survey form and gets about 20 percent to respond.

a) Do you consider such a sample to adequately random? Why?

b) How might cluster samples solve the problem that you see in the original approach. What concern do you have with the clustered approach?

c) How might a systematic sample be selected and what advantage and disadvantage would it have?

14 pts.

2) The sampling distribution for $\bar{x}$ is given below.

$\bar{x}$	probabitity
1	.3
2	.3
3	.2
4	.2

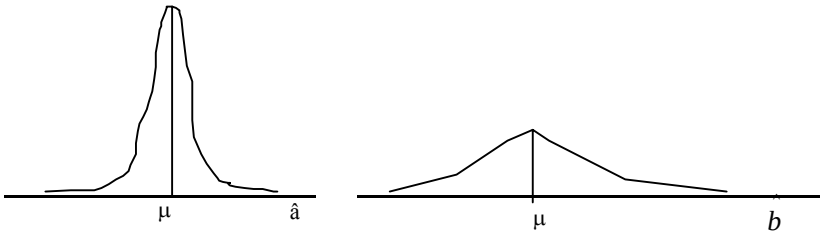
a) What must μ equal?

b) Calculate $\sigma_{\bar{x}}$.

c) If sampling was with replacement and n = 4, what must σ equal?

14 pts.

3) Consider the diagrams below.



3) a) Does $\hat{a}$ appear to be an unbiased estimator of μ? Why?

b) Does the diagram indicate that $\hat{b}$ is a consistent estimator of μ? Why?

c) Do the diagrams indicate that $\hat{a}$ is a more efficient estimator of μ? Why?

24 pts

4) **Computer Problem.** a) Open the "Fast Food" file in the Chapter 8 folder of the 2216 files.

b) Use Excel to get a 99 percent confidence interval for the population mean of the Times.

c) Are the data particularly skewed? Explain?

d) Is the maximum value an outlier? Explain?

e) Now use SPSS to test the hypothesis that the population mean is 5. Show all steps to the test ($\alpha = .10$).

f) If you learn that this sample is half of the population, how does this affect your results? Just describe, don't calculate.

14 pts.

5) a) The CIA thinks that the proportion of Iraq's population injured last year was more than .1. A sample of 1000 finds the proportion to be .11. Is this convincing evidence that the CIA is right ($\alpha = .05$)? Show all steps to the test.

20 pts.

6) The XYZ Corp. thinks that sales in its stores average less than $50000 a week. It has a sample of 100 stores that average $50400 with a standard deviation of 2000.

a) Does the information above make convincing evidence in support of the hypothesis? Show all steps to the test ($\alpha = .05$).

b) If the real mean is $49500, what is the power of the test?

I have neither given nor received unfair aid on this test nor am I aware of anyone else who has. _____