

First Exam

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

12 pts.

- 1) Mr. X is collecting data. He has selected a sample using a random selection procedure in his computer but only 30% of the intended sample have responded to his survey. Anticipating that this might happen, Mr. X instructed his collection crew to keep track of how hard it was to get each of their respondents to respond.
- Briefly explain one good thing that you like about Mr. X's sample and one thing that you don't like.
 - What use do you expect Mr. X to make of the information about how hard it was to get the responses?

20 pts.

- 2) Suppose that we have a trivially small population of (3,6,9) and we take a sample of 2 without replacement.
- Show the possible samples and their means and probabilities.
 - Use this information to show that the sample mean is an unbiased estimator.
 - Use this information to show that our formula for $\sigma_{\bar{x}}$ works.

14 pts.

- 3) Suppose that we have this sample {0,0,1,5,9}.
- Are the data skewed? Why?
 - Calculate the skewness coefficient and interpret it.

14 pts

4) **Computer Problem.**

- Use the Fast Food in the Chapter 8 folder of the 2216 files to construct a 90% confidence interval for μ . Use either Excel or SPSS and print your results with your name typed into it.
- Does the population need to be normally distributed for this? Explain.

20 pts.

- 5) a) Your company changes its advertising effort if surveys give convincing evidence that market share (your proportion of the market) is less than .20. What will it do if a sample of 10000 people give it a share of .18 and $\alpha = .01$. Show all steps to the test.
- b) What is the power of the test if the real proportion is .19?

20 pts

6 Suppose that you think that the average age of the McDaniel faculty is 47 and you take a sample of 30 and the mean is 44 and standard deviation is 10.

a) Use this information to test your hypothesis at the 5 percent level of significance.

Show all steps to the test.

b) If the faculty size is 90, how does this change your calculations? Show the new ones.

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