

First Exam

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

16 pts.

- 1) Briefly describe one sampling flaw in each of the following and describe the conditions that we need for this flaw not to be serious and an advantage of the approach.
- Mr X wants to study McDaniel students so he sets up a table outside the cafeteria and where he gives students a small reward if they complete his form.
 - Ms Y wants to study farms in her state and she lives in a farming community. So she randomly selects a sample from her community.
 - Mr. Z's town has 5 neighborhoods that are substantially different. He has a list of residences that are organized by neighborhood and he takes a random sample from the entire list.

20 pts.

- 2) Suppose that we have a trivially small population of (4,7,10) and that we sample without replacement and $n = 2$.
- Show the sampling distribution for \bar{x} and show that it is unbiased.
 - Now show the sampling distribution for \bar{x} when sampling with replacement and show that it is unbiased.
 - Find the variances for each of the distributions above (including the population).
 - Use the standard formulas for $\sigma_{\bar{x}}$ to confirm your results for part c.

12 pts.

- 3) Construct a 99% confidence interval for p , given that \bar{p} is .6. ($n = 36$)

14 pts.

- 4) You have a sample mean equal to 125. Is this convincing evidence that μ is greater than 120, if $s = 10$ and $n = 25$. Show all steps to a hypothesis test where α is .05.

20 pts.

5) Consider the data below to estimate a demand curve.

Price	Quantity
7	1
6	3
4	5
2	7

- Find by hand (show work) the regression equation where Quantity is a function of Price .
- Find the r^2 . Interpret it.
- Calculate a statistic that measures how well the data are correlated. Use it to test for the significance of the correlation. ($\alpha = .01$, show all steps to the test)

18 pts

- 6) **Computer Problem.** a) Use the Boots file in the Chapter 14 folder of the 2216 files with your choice of SPSS or Excel for a regression where price is a function of support. Be sure to type your name into the printout.
- Write the regression equation by hand on to the printout,.
 - Does there seem to be a significant relationship? Use two of the statistics in the printout to conduct the test and lay out all the steps of the test ($\alpha = .05$).

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