

Your answers to the following sample midterm is to be submitted as Assignment #7 by 4 pm on Tuesday, March 9. The material presented at the March 9 lecture will be included in the March 16 midterm but is omitted from Assignment #7: you do not need to answer Q8 below for the assignment, but it is included here for your midterm preparation. As in the first midterm, the eight questions on the March 16 midterm will count equally, and the total time for the midterm will be 60 minutes.

1. A population consists of the 1000 numbers in the range 0 to 100. A random sample of 36 numbers from this population has a mean of 33.0 and an SD of 3.0. A second random sample of 36 numbers is taken from this same population. Is there any information in the first sample about how far from the population mean the second sample mean might be? Explain.
2. In a regression of the second midterm mark on the first midterm mark, a regression line could be used. Explain how a residual plot can help to assess the adequacy of the regression line model. Note: Residual = observed value – regression line estimate.
3. The marks on the first midterm could be used to predict the marks on the second midterm. Two methods that might be used are
 - a) Predict second midterm mark = first midterm mark
 - b) Use the regression line to predict the second midterm mark from the first midterm mark.What is the main advantage of each method?
4. What is Simpson's Paradox and why is it instructive for students of statistics?
5. How does the randomized response technique (such as we described in the survey of marijuana use) protect the privacy of the respondents?
6. In the article "Evaluating School Choice Programs" by Hill (pp 69-87), a "natural experiment" allowed the investigators to perform an ethical experiment on human beings, when usually this is difficult to arrange. Why was this described as a "natural experiment"?
7.
 - a) Why is a placebo group often required in a randomized clinical trial?
 - b) Why is it usual to have "double-blind" assessment in a randomized clinical trial?
8. A wealthy person offers to buy as many tickets as the the BC Lottery Commission (BCLC) expects to sell for a particular issue of the 6/49 Lottery. BCLC must undertake not to sell tickets to anyone else if they accept the offer. Is this a good deal for the BCLC? Is it a good deal for the wealthy person? Provide explanations for your answers.