**DUE: 5/3/2012**

**SHOW ALL WORK!!**

1) Our goal is to estimate the average lifespan of a certain bacteria under exposure to extreme heat. We take a sample of 500 bacteria and record an average lifespan of 1.3 minutes. The believed standard deviation of the lifespan of bacteria is 24 seconds.

   a. Develop a 99% Confidence Interval for the true average lifespan.

   b. What assumptions are required for this test to be valid? Are they satisfied here?

   c. Explain what it means to be 99% Confident.


2) You work in the admissions office at a state university. You are in charge of estimating the proportion of in-state students that will be entering the university in the following year. You want to ensure that you are within 5 percent of the true proportion, so that an accurate value can be placed on the budget.

   a. If you wish to construct a 95% Confidence Interval, what sample size would be required assuming you have no prior information about the true proportion of in-state students.

   b. If you look up the current year's admissions, you find that 72% of students paid in-state tuition. Calculate the modified sample size with this new piece of information.


3) **REVIEW QUESTION (FROM CHAPTER 7)**
   You are trying to throw a party for a group of 250 individuals. You want to buy soda for the party, and you get a discount if you buy in bulk and only 1 brand (ie, either Coke or Pepsi). You decide to buy Coke only, since you came across a study that said that 54% of people prefer Coke to Pepsi. Assuming this proportion is correct, what is the probability of having ***more than*** 125 people in your group (ie, a majority) that actually prefer Pepsi to Coke. Use the ***Normal Approximation to the Binomial*** to solve this. Don't forget to check your assumptions!!