POLS 7014
INTERMEDIATE POLITICAL METHODOLOGY
HOMEWORK 2

For questions 1-3, assume a variable is normally distributed with a mean of 180 and a standard deviation of 25. Please show all work, and use the table found inside the back cover of your textbook.

1. What is the probability that a single draw from this distribution, labeled X, will be greater than 210?

2. What is the probability that a single draw from this distribution, labeled Y, will be less than 182?

3. What is the probability that a single draw from this distribution, labeled Z, will be between 160 and 192?

4. Being hit by a chair is a common occurrence in WWE professional wrestling. The number of people hit upside the head with chairs can vary from program to program. Suppose that the number of chair-bashings per program is Normally distributed, with mean thirty-five (35) bashings and standard deviation of eight (8) bashings. What is the probability that one WWE program will contain less than nineteen (19) bashings or more than forty (40) bashings?

5. We have collected data to better understand ticket scalping at Georgia football games. We randomly sampled n=32 ticket brokers ("scalpers"), and recorded the amount charged for a seat in the Club Level. From our sample we computed a sample mean of \$72 with a variance of \$169. Construct both a 90% and 99% confidence interval for the average ticket price for these seats.

6. For this problem you will need to use statistical software to simulate a sampling distribution and generate a graph displaying that distribution. Do your best to make your graph "publication ready." A title, labels for the two distributions, and labels for the axes are all nice touches. Figure 4.12 in Agresti and Finlay provides an example of what the graph should look like.

   - Create a graph of a normal distribution such that $\mu = 100$ and $\sigma = 10$.
   - Use statistical software to draw 100 samples of 40 observations each from the above normal distribution. Calculate the mean of each of your 100 samples. Create a density plot of these means to graphically display your "sampling distribution".
   - Repeat the above step, but draw 100 samples of 1000 observations each. How did your "sampling distribution" change? Why?
   - Calculate the standard deviation of the sample where $n = 40$. Calculate the standard deviation you get from the formula we learned in class. Are these two numbers similar? If not, why?