Homework #6: Significance Tests
(small & large n; means & proportions)

- Be as complete and explicit as possible in your answers. On this and all assignments, show all work done, including any calculations, and write all answers in prose (sentence/paragraph) form; single-word or phrase answers are not sufficient, and points *will* be deducted for incomplete answers.

- Note: You need not elaborate all of the steps of the hypothesis test for these first four problems (except where asked), but you *must* do so for the problems from the book.

- *Hint for all problems: Draw a picture first!!* .

Part I
- From the Agresti & Finlay problems for chapter 6 (pp. 171-182), do problems 2, 8, 14, & 52.

Part II
- Do the following four problems:

1. State the null hypothesis H_o and the alternative hypothesis H_a that would be used for a hypothesis test related to each of the following statements. Clearly specify whether they are one- or two-tailed tests:
    a. The mean age of students enrolled in evening classes at Piedmont Community College is greater than 26 years.
    b. The mean distance from a hotel room in Amsterdam to the nearest museum is less than 200 yards.
    c. The mean life of a carburetor is 10,000 miles.
    d. The mean weight of college football players is no more than 210 lbs.
    e. One in ten CSUN students has been arrested for public drunkenness

2. For a large-sample test of H_o: Mu = 0 against H_a: Mu is not equal to 0, the z statistic equals 1.07.
    a. Find the p-value, and interpret it.
    b. Suppose z = -2.51 rather that 1.07 – Find the p-value and interpret it.
    c. Does the larger z score mean stronger or weaker evidence *in re* the null hypothesis? Explain.

3. Find and interpret the p-value for testing Ho: Mu = 10 against Ha: Mu is not equal to 10, if...
    a. ... a sample of 40 observations has a standard deviation of 4 and a mean of 10.3
    b. ... a sample of 40 observations has a standard deviation of 4 and a mean of 9.7
    c. ... a sample of 160 observations has a standard deviation of 4 and a mean of 9.7
    d. ... a sample of 160 observations has a standard deviation of 2 and a mean of 9.7

4. Out of a random sample of 500 individuals who are planning to vote in a student council election, 260 plan on voting for Jefferson and 240 plan on voting for Smith.
    a. Construct a 95% confidence interval for the proportion of votes that Jefferson will receive, and make a conclusion about whether Jefferson will win the election.
    b. Calculate a z-score and interpret the probability (using 0.05 as the alpha level) in order to make a conclusion about whether Jefferson will win.
    c. Compare your results from a and b – do you think Jefferson will win the election?