# Homework for Math 211, Summer 2010, Part 5

**P.** Chapter 18: 15, 21, 26, 37, 39b, 47, 48. (recommended: 5, 7, 9, 27, 28, 35, 50.)

Also:

1. The ISA Babcock company supplies poultry farmers with hens, advertising that a mature B300 Layer produces eggs with a mean weight of 60.7 grams. Suppose that egg weights follow a Normal model with standard deviation 3.1 grams.

a. What fraction of the eggs produced by these hens weigh more than 62 grams?

b. What's the probability that a dozen randomly selected eggs average more than 62 grams?

2. Public health statistics indicate that 26.4% of American adults smoke cigarettes.

a. What's the probability that a randomly selected American adult smokes cigarettes?

b. You select 50 American adults at random. What is the probability that less than 25% of them smoke cigarettes?

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**Q**. Chapter 19: 3, 5, 7, 13, 17, 21, 27, 36, 42.

Also:

1. In the 2008 US Presidential election, the official results showed that Barack Obama received 52.9% of the vote and John McCain received 45.7% of the vote. Running as a third-party candidate, Bob Barr received 0.4% of the vote. Suppose you had taken a random sample of 1000 voters in an exit poll and asked them for whom they had voted.

a. Would you always get 457 votes for McCain and 529 votes for Obama?

b. In 95% of such polls, your sample proportion of voters for Obama should be between what two values?

c. In 95% of such polls, your sample proportion of voters for Barr should be between what two values?

d*. Would you expect the sample proportion of Nader votes to vary more, less, or about the same as the sample proportion of Obama votes? Why?

**R.** Chapter 20: 3, 6, 7, 13, 14, 28, 29, 35 (Recommended: 1, 4, 9, 10, 11, 26, 32).

Also:

1. Recently the state of Washington outlawed the use of a cell phone while driving. A local politician claims that the new law has reduced such cell phone use to just 15% of all drivers. To test his claim, you observe a sample of 125 drivers on a busy street in your neighborhood. You notice that 28 of them are talking (or texting) while driving. You would like to know if your observed sample provides strong evidence that the actual rate of people using their cell phones while driving is *higher* than what the politician claimed.

a. Are the conditions for performing a hypothesis test satisfied? Explain.

b. Suppose the conditions for performing a test *are* satisfied. Find the *p*-value and explain in a clear English sentence what it represents.

c. Do you think your sample does in fact provide strong evidence that the actual proportion of people using their phones illegally is higher than the politician's claim? Explain.