**Math 180 Fall, 2014 Assignment 8**

This assignment is due on Tuesday, November 4.

1. Honest Markets wants to make sure that its 3-pound bags of apples actually do contain at least 3 pounds 99% of the time. If the standard deviation of a 3-pound bag is 2 ounces, what is the minimum mean weight of apples it must put into a “3-pound” bag to meet its goal?

2. Professor Jane Doe at Legal Eagle Law School in Lawville sends each member of her class of 100 students out to survey student monthly rental costs as part of a cost-of-living survey. Suppose each student is told to ask exactly 10 randomly chosen students about their monthly costs. Professor Doe does not ask the students to report all their findings, but only the average monthly cost and the standard deviation of the costs in each of the 100 reports. To get a best estimate of the average (mean) cost, is the professor justified in averaging the 100 averages? What about the standard deviation? Does this depend on how the professor told the students to compute the standard deviation?

a) Suppose that the grand average of monthly costs was $1145 and that the average of the reported standard deviations was $150. What is the probability that a student would report an average of $1100 or less?

b) (*This part is a real challenge*.) Suppose that 98 of the students quit, saying that this assignment is too hard, and that only John and Mary report. If John reports an average rental of $1145 with a standard deviation of $150 and Mary reports an average rental of $1100 with a standard deviation of $100, what is the best estimate of the mean rental and the overall standard deviation of rental costs? What is the probability that the two reports of average rental would differ by $45 or more?

*We’ll discuss what you need to do this assignment in class tomorrow.*