Quiz # 2 **Stat 3445, Due Feb 8**

Name:

1. The efficiency ratings (in lumens per watt) of light bulbs of a certain type have a population mean of 9.5 and a standard deviation of 0.5, according to production specifications. The specifications for a room in which eight of these bulbs are to be installed call for the average efficiency of the eight bulbs to exceed 10.

   (a) Find the probability that this specification for the room will be met, assuming efficiency measurements are normally distributed.

   (b) What should the mean efficiency per bulb equal if the specification for the room is to be met with probability approximately 0.90? (Assume the standard deviation of efficiency measurements remains at 0.5.)

2. In constructing an aptitude test for a job, it is important to plan for a fairly large variance in test scores so the best applicants can be easily identified. For a certain test, scores are assumed to be normally distributed with a mean of 80 and a standard deviation of 10. A dozen applicants are to take the aptitude test.

   (a) Find the approximate probability that the sample standard deviation of the scores for these applicants will exceed 15.

   (b) Find an interval in which the sample variance of test scores should lie with probability .90 (with 5% in each tail).