

# AMS 310 - Practice Exam for Midterm II

Wednesday, April 20, 2005

1. 5.76, 5.77, 5.78, 5.79 (pg. 188)
2. 5.122 (pg. 202)
3. The weights of a population of workers have mean 167 and standard deviation 27. If a sample of 36 workers is chosen, approximate the probability that the sample mean of their weights lies between 163 and 170.
4. An astronomer wants to measure the distance from her observatory to a distant star. However, due to atmospheric disturbances, any measurement will not yield the exact distance  $d$ . As a result, the astronomer has decided to make a series of measurements and then use their average value as an estimate of the actual distance. If the astronomer believes that the values of successive measurements are independent random variables with a mean of  $d$  light years and a standard deviation of 2 light years, how many measurements need she make to be at least 95% certain that her estimate is accurate to within  $\pm 0.5$  light years?
5. 7.83 (pg. 276)
6. The weights of salmon grown at a commercial hatchery are normally distributed with a standard deviation of 1.2 pounds. The hatchery claims that the mean weight of this year's crop is at least 7.6 pounds. Suppose a random sample of 16 fish yielded an average weight of 7.2 pounds. Is this strong enough evidence to reject the hatchery's claims at the
  - (a) 5 % level of significance?
  - (b) 1 % level of significance?
  - (c) What is the p-value?
7. There is some variability in the amount of phenobarbital in each capsule sold by the manufacturer. However, the manufacturer claims that the mean value is 20 mg. To test this, a sample of 25 pills yielded a sample mean of 19.7 with a sample standard deviation of 1.3. What inference would you draw from these data? In particular, are the data strong enough evidence to discredit the claim of manufacturer? Use the 5 percent level of significance.
8. 7.56 (pg. 258)