

## Stat 518 - Homework 4

Due: Friday, October 13th

- 1) For the data in problem 1 on page 148, by hand, SAS, and S-Plus perform the following:
  - a) Report the p-value for the test of the null hypothesis that the mean weight is 103 against the alternate hypothesis that the mean weight is greater than 103.
  - b) Construct a 90% confidence interval for the mean weight of tenth-grade boys.
  - c) Construct a q-q plot for the data. Were the assumptions for part a and b met? (You do not need to do this part by hand.)
  - d) Report the p-value for the test of the null hypothesis that the median weight is 103 against the alternate hypothesis that the median weight is greater than 103.
  - e) Construct a (near) 90% confidence interval for the median weight of tenth-grade boys. State the exact confidence level for the interval.
  
- 2) If  $X$  is normal, then the assumptions of both the t-test and sign test are met, and the mean and median are identical. Suppose the null hypothesis states that the mean is 0.0, the alternate hypothesis states that the mean is greater than 0.0, the actual mean is 0.25, the population variance is 1.0, and the sample size is 10, and  $\alpha=0.05$ . Use S-Plus to find the exact power of both tests in this case, and to estimate the power using a simulation.
  
- 3) Page 176 #1.