

EXAM 2
(Take home portion)
Stat 201
March 19, 2009

Name _____

1. For a population of 17-year-old boys and 17-year-old girls the means and standard deviations, respectively of their subscapular skinfold thickness values are as follows: boys, 9.7 and 6.0, girls, 15.6 and 9.5. Simple random samples of 40 boys and 30 girls are selected from the population. What is the probability that the difference between the sample means $\bar{x}_{girls} - \bar{x}_{boys}$ will be greater than 8? State any necessary assumptions then calculate the 99% confidence interval for $\mu_{girls} - \mu_{boys}$. (20 pts)
2. Measurements of gastric secretion of hydrochloric acid (milliequivalents per hour) in 16 normal subjects and 10 subjects with duodenal ulcer yielded the following results:
Normal subjects: 6.3, 2.0, 2.3, 0.5, 1.9, 3.2, 4.1, 4.0, 6.2, 6.1, 3.5, 1.3, 1.7, 4.5, 6.3, 6.2
Ulcer subjects: 13.7, 20.6, 15.9, 28.4, 29.4, 18.4, 21.1, 3.0, 26.2, 13.0
Construct a 95% confidence interval for the difference in the mean values of the populations. (13 pts)
3. In a certain area of a large city it is hypothesized that 40 percent of the houses are in a dilapidated condition. A random sample of 75 houses from this section and 90 houses from another section yielded a difference, $\hat{p}_1 - \hat{p}_2$ of .09. If there is no actual difference between the two areas in the proportion of dilapidated houses, what is the probability of observing a difference this large or larger? Find a 90% confidence interval for the true difference in the proportion of dilapidated houses? (12 pts)
4. In a study of myocardial transit times, appearance transit times were obtained on a sample of 30 patients with coronary artery disease. The sample variance was found to be 1.03. Construct 99% confidence intervals for σ^2 and for σ . State any assumptions you made in order to do this. (15 pts)