Math 222 - Midterm 3 Review

Midterm 3 will focus on the following topics.

Bootstrap Method Understand that bootstrapping lets us make confidence intervals for parameters without knowing the sampling distribution. The bootstrap distribution simulates the shape and spread of the sampling distribution of our statistic. You won't need to write any R-code for bootstrapping, but you should understand R code and be able to explain it if it is on the test. You should also know the formula for a bootstrap confidence interval:

$$\text{statistic} \pm t^* SE_{\text{bootstrap}}.$$

Comparing two proportions using both the two sample z-test, and using permutation tests. Related topics: plus-4 confidence intervals for the difference in two proportions.

Recommended Practice Problems: 6.23, 6.26, 6.29, 6.31

Chi-squared test for goodness of fit You should be able to calculate χ^2 by hand, and know how many degrees of freedom there are. You can use the R functions `pchisq()` and `qchisq()` to express your answers if you need to work with percentiles on the chi-squared distribution.

Recommended Practice Problems: 6.41, 6.43

Chi-squared test for association Make sure you are comfortable working with two way tables and understand row and column proportions, segmented bar graphs, and mosaic plots.

Recommended Practice Problems: 6.45, 6.47, 6.49

Correlation Remember that the correlation coefficient r only measures the strength of a linear trend.

Recommended Practice Problems: 7.5, 7.6, 7.7, 7.17

Least Squares Regression Make sure you can interpret the slope of a regression line in words. Also, understand regression to the mean, and that r^2 represents the percent of the variance in y-values that is explained by the trend.

Recommended Practice Problems: 7.19, 7.25, 7.29