

## Midterm 3 Study Guide

This is meant to be a representative sampling of the key concepts you will need to know, and it is not meant to be exhaustive. You should make sure that you are comfortable with Quizzes 10-11 and Homework Assignments 15-17.

1. What are the mean and standard deviation of  $X$  and  $\hat{p}$  in a binomial setting?
2. What condition must  $n$ ,  $p$  satisfy in order for us to be able to use the normal distribution for the computations in a binomial setting?
3. What conditions must hold in order for us to be in the IID setting?
4. What do  $\mu$  and  $\sigma$  represent in the IID setting?
5. What are the formulas for the mean and standard deviation of  $\bar{x}$  in the IID setting?
6. What does the Central Limit Theorem say?
7. What do we refer to when we talk about the *sampling distribution* of  $\bar{x}$ ?
8. What quantities do we refer to as *parameters*, and what quantities do we refer to as *statistics*?
9. What is the general goal of a *confidence interval*?
10. State precisely what the confidence interval for the population mean  $\mu$  says, describing all the terms needed along the way.
11. What are the options we have when we want to reduce the *margin of error*? What are the tradeoffs?
12. How do we compute the sample size needed to achieve a specific margin of error?
13. What is the general idea behind a hypothesis test?
14. What are the two kinds of conclusions we can get from a hypothesis test?
15. What errors do we refer to as Type I errors? What about Type II errors?
16. What three parts of our work in a hypothesis test or confidence interval are affected by the sample size and a change in the sample size?