Exam 3 Objectives

For Exam 3, a well-prepared student should be able to

- distinguish between a population distribution and a sampling distribution
- define sample count and sample proportion
- describe the binomial setting and the binomial distribution
- use a table or computing technology to compute a binomial probability or a cumulative probability
- understand the connection between the sampling distribution of the count of successes in a SRS and the relevant binomial distribution
- compute and use the mean and standard deviation for a binomial count or proportion
- understand and use the connection between a binomial distribution and the approximating normal distribution when the number of trials is large
- describe the connection between
  - the mean and standard deviation of a population
  - the mean and standard deviation of the sample mean distribution
- understand and use the fact that if the population distribution is normal, then the sample mean distribution is normal
- state the central limit theorem and describe its relevance to using the sample mean as a statistic
- understand and use the fact that if the sample size is large, then the sample mean distribution is approximately normal
- interpret the meaning of a confidence interval, including the confidence level, the estimate, and the margin of error
- compute a confidence interval for a population mean using the population standard deviation and the sample mean for a SRS assuming the population is normal or the sample size is large
- understand and use the relationship among margin of error, confidence level, sample size, and population standard deviation for a sample mean distribution that is normal or approximately normal
- form an appropriate null hypothesis and alternative hypothesis
- describe the structure of a significance test, including the roles of the test statistic, the P-value, and the significance level
- use the z-statistic appropriately to test a null hypothesis concerning the value of an unknown population mean
- use a P-value to supplement the choice between rejecting or accepting a null hypothesis
- interpret the result of a significance test in real-world terms