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