- Be able to determine what is/is not a statistic.
- Be able to define all aspects of the distribution of $\bar{X}$

- Given a sample of $n = X$ from a population having $\mu = Y$ and $\sigma = Z$, the Empirical Rule would state 95% fall within?
- Given $\pi$, be able to determine the smallest value of $n$ for which the distribution of $p$ would be reasonably approximated by a normal distribution.
- Know everything inside & out concerning The Central Limit Theorem & its application to the sampling distribution $\bar{X}$ & the sampling distribution of $p$.
- Know what the sampling distribution of the sample variance is based on:
- Which of the following statements concerning the Central Limit Theorem is true?
- Be able to determine when the distribution of $p$ will tend to be closest to $\pi$.
- Know which are biased & unbiased statistics.
- Know when a statistic tends to produce an accurate estimate of a population characteristic when.
- Suppose a specific confidence interval is computed for $\mu$ resulting in the interval $(X, Y)$. Then be able to describe the meaning of the interval & the meaning of the accuracy.
- Be able to describe the bound on the error of estimation associated with a specific confidence interval for $\mu$.
- Given $\sigma$, be able to determine the sample size required to estimate a population mean $\mu$ to within $B$ with a specific confidence level.
- Given choices, be able to determine which confidence interval formulas are based on the Central Limit Theorem.
- Be able to determine the conservative sample size required to estimate a population proportion $\pi$ to within $B$ with specific confidence.
- The large sample confidence interval formula for estimating $\pi$ should only be used under what circumstances.
- Know the properties of the $t$ distribution.
- Know what influences the width of a large sample confidence interval for $\mu$.
- Given a mean & standard deviation, be able to determine the mean & standard deviation of the sampling distribution of $\bar{X}$ for a particular samples of size $n$ and be able to determine $P(\bar{X} < \text{some #})$.

- Given $\pi$ for a sample of size $n$, be able to determine the mean & standard deviation of the sampling distribution of $p$ and be able to determine the approximate probability that the sample proportion $p$ is between $X$ and $Y$.

- Given a previous sample mean & standard deviation along with a target to reach & sample size, be able to determine $P(x \leq \text{some percentage})$.
- For a combination of $n$ and $\pi$, be able to calculate the standard error of the sampling distribution of the sample proportion $p$.
- Suppose it is known that 70% of students at a particular college are smokers. A sample of 400 students from the college is selected at random. Approximate the probability that at least 320 of these students are smokers.
- The chairman of a statistics department in a certain college believes that 80% of the department's graduate assistantships are given to international students. A random sample of 60 graduate assistants is taken. Assume that the chairman is correct and that $\pi = 0.80$. Find the expected value and the standard error of the sampling distribution of $p$.
- A producer of a juice drink advertises that it contains 10% real fruit juices. A sample of 75 bottles of the drink is analyzed and the percent of real fruit juices is found to be 6.2%. If the true proportion is actually 0.10, what is the probability that the sample percent will be 6.2% or less?
- A recent study investigated the effects of a campaign. Investigators observed 190 out of 600 comply. Assume it is reasonable to regard this sample as representative of the population. Compute the point estimate of the true proportion & construct and interpret a 95% confidence interval for $\pi$.
- Ten animals were exposed to ambient temperatures of 30 degrees Celsius. Their body temperatures were 24.33, 24.61, 24, 25, 22, 27, 25, 23, 20, 24. It is reasonable to regard these data as a random sample from the population. Calculate a point estimate of the population mean and construct and interpret a 90% confidence interval for $\mu$. 

Chapter 8-9 Study Guide
Local health authorities are concerned that the hectic pace in their city has elevated the stress, and thus the blood pressure of women. The authorities have decided to study this issue by measuring the blood pressure of a random sample of patients in the city over the next year and estimating the mean blood pressure \( \mu \) of women in the city. Blood pressure is approximately normally distributed in humans, and a 15-year-old study suggests the standard deviation of women's blood pressure is about 10 mm Hg. Suppose the health authorities accept this value as a reasonable estimate of the standard deviation of blood pressure of today's women in this city. If it is desired to estimate \( \mu \) to within 2.0 mm Hg with 90% confidence, what sample size is necessary?

- A random sample of is taken 3, 7, 11, 6, 7, 3, 9, 8, 11, 8. Calculate a point estimate of the population mean, create a dotplot of the data, construct and interpret a 95% confidence interval for \( \mu \). Does your work provide evidence that the mean level in the population differs from 6.0

Counselors select a random sample of 100 students and scored their PSAT tests by hand before sending them for computer processing. For this sample, \( \bar{x} = 500 \) and \( s = 30 \). Construct a 95% confidence interval for \( \mu \)

- A random sample of 25 yielded a mean of 2,200 and standard deviation of 72. What are the point estimates for the true mean and the point estimate for the variance of this population?

- A simple random sample of 15 is selected & the number of days each was absent is 2, 3, 5, 5, 7, 3, 5, 0, 3, and 1. What is the point estimate for \( \mu \)?

- A simple random sample of 8 is selected 3, 4, 8, 1, 2, 6, 1, and 5. What is the point estimate for the variance of the mean.

- Determine the limits of the 95% confidence interval for \( \mu \) given that \( n = 150; \bar{x} = 11; \) and \( \sigma = 1.52 \).

A light is advertised to last up to 3 1/2 hours per charge and to recharge overnight. A random sample of 15 lights has a mean time of 2.25 hours and a standard deviation of 1.30 hours. What is the 95% confidence interval estimate for the population mean?

- Determine the limits of the 85% confidence interval for \( \pi \), given that \( n = 60; \) and \( p = 0.18 \).

A survey of 9,500 residents showed that 7,500 favored a downtown arena. Construct a 80% confidence interval.

- In a survey of 530, 56% indicated a positive response. Prepare a 93% confidence interval for the population proportion.

What is the difference between an unbiased statistic and a biased statistic?

- Be able to define a "point estimate" and "interval estimate" of a population characteristic. What is the difference between the two?

Under what conditions is it reasonable to use the \( z/ t \) confidence interval to estimate a population mean?

- How does one determine if a sample size is large enough so that the statistic \( p \) has an approximately normal sampling distribution.

Briefly be able to explain how a \( z \) distribution and a \( t \) distribution differ.

Given 2 confidence intervals for \( \mu \) be able to determine which is 80% and 90%. CI & why

- Be able to indicated under what conditions a confidence interval for \( \mu \) can be computed when \( \sigma \) is unknown