

# Lesson 17: Inference for One Proportion

## Preparation

**Directions:** Please fill in Part I as you study the Reading Assignment. Once you finish the reading, complete the questions on Part II. You may use your notes, the key, and the help videos. Be sure to take this completed assignment to your group meeting where you can ask and help answer questions on this assignment.

## Problems

**Part I:** Use the information in the reading assignment to complete these questions.

1. When given a sample, what is the formula for the point estimate ( $\hat{p}$ ) for a population proportion? Explain which each variable stands for in your formula.
2. What is the formula for the one-proportion confidence interval for one proportion?
3. What is the condition required to build the one-proportion confidence interval above?
4. If no prior estimate for the population proportion,  $p$ , is available what is the sample size formula to get the needed sample based on desired margin of error? Explain what each variable stands for in your formula.
5. What is the test statistic for a hypothesis test regarding the population proportion?
6. What are the conditions that need to be satisfied so the sample size is large enough that the Central Limit Theorem suggests the sample proportion,  $\hat{p}$  is approximately normal?

**Part II:** You will complete Part II with your group at Group Preparation

7. **Confidence Interval** - In an October 2008 poll, 684 of 1006 randomly selected college students reported that they had been involved in an automobile accident within the last 5 years.
  - a. Find the proportion of those surveyed who have been in an automobile accident in the last 5 years.
  - b. Check requirements in constructing a confidence interval for this data.
  - c. Determine the margin of error for a 95% confidence interval based on these data.
  - d. Construct and interpret the 95% confidence interval for the proportion of those who have been involved in an automobile accident in the last 5 years.
  - e. How many college students should you survey if you want a 95% confidence interval with a margin of error of no more than 0.015.
8. **Hypothesis Test** - Now you are interested in testing a claim that over 60% of all students have been in a car accident within the last 5 years. Use the same information as above and use a level of significance of  $\alpha = 0.05$ .
  - a. State the null and alternative hypotheses

- b. Compute the Test Statistic
- c. Determine P-Value based on Test Statistic. Sketch your P-value on the normal distribution curve with the Test statistic labeled.
- d. What decision do you make about the null hypothesis?
- e. State your conclusions.