Quiz # 4 STA2023
Confidence Intervals and Hypothesis Tests for Proportions

Name_____

Times/Days attend class_____

Date_____

Provide all of your work and answers in the spaces provided. However, you may attach additional work if you want to. ***Show all work for full credit***. Your submitted quiz should *not* be a rough draft. You are allowed to seek out help from the Math Support Center, study groups, and/or the class instructor, but you must submit only your own work: do not copy! Remember, even though you may work with other people, you are graded individually. Write up your final draft by yourself and in your own style. Your work/responses must be your own. There are three printed pages to this quiz.

1. (11 pts. total) An Associated Press article on potential violent behavior reported the results of a survey of 750 workers who were employed full time (*San Luis Obispo Tribune*, Sept. 7, 1999). Of those surveyed, 125 indicated that they were so angered by a co-worker during the past year that he or she felt like hitting the person (but didn't). Assuming that it is reasonable to regard this sample of 750 as a random sample from the population of full-time workers, we can use this information to construct an estimate for p, the true proportion of full-time workers so angered in the last year that they wanted to hit a colleague.
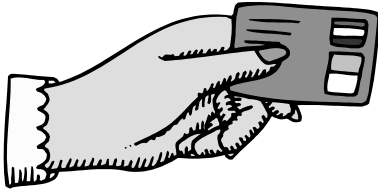
   a. Construct, showing all values substituted into your formula, a 90% confidence interval for p. The confidence interval should be given in interval notation.

   b. Interpret the confidence interval given in part a. Remember to interpret the result in full english sentences (no notation, use story problem situation with units of measure where applicable).

   c. State in detail, citing values from the story problem situation, all of the reasons why we are allowed to construct the confidence interval from part a.

2. (7 pts. total) The article "Credit Cards and College Students: Who Pays, Who Benefits?" (*J. College Student Development* (1998): 50-56) described a study of credit card payment practices of college students. According to the authors of the article, the credit card industry asserts that at most 50% of college students carry a credit card balance from month to month. However, the authors of the article report that, in a random sample of 310 college students, 217 carried a balance each month. Does this sample provide sufficient evidence to reject the industry claim?

State the appropriate H_0 and H_a to test this suspicion. Carry out the test at the 5% level, showing all steps clearly labeled, including giving the test statistic value derived from its formula with substituted values, and including the calculated P-value showing proper inputs to normalcdf. Remember to interpret the result in full english sentences (no notation, use story problem situation with units of measure where applicable).

3. (7 pts. total) According to the article "Which Adults Do Underage Youth Ask for Cigarettes?" (*American Journal of Public Health* (1999): 1561—1564), 43.6% of the 149 18- to 19-year-olds in a random sample have been asked to buy cigarettes for an underage smoker. Is there convincing evidence that fewer than half of 18- to 19-year-olds have been approached to buy cigarettes by an underage smoker?

State the appropriate H_0 and H_a to test this suspicion.

Carry out the test at the 1% level, showing all steps clearly labeled, including giving the test statistic value derived from its formula with substituted values, and including the calculated P-value showing proper inputs to normalcdf. Remember to interpret the result in full english sentences (no notation, use story problem situation with units of measure where applicable).