Name:_____ AP Stats Group Assignment:Ch12.2 Testing About a Population Proportion:

Question 1)

Anyone who plays or watches sports has heard of the "home field advantage." Teams tend to win more often when they play at home. Or do they?

If there were no home field advantage, the home teams would win about half of all games played. In 2002 major league baseball season there were 2425 regular season games. It turns out that the home team won 1314 of the 2425 games, or 54.2% of the time. Could this deviation from 50% be explained just from natural sampling variability, or is this evidence to suggest that there really is a home field advantage, at least in professional baseball?

a) State the Null and alternative hypothesis
b) Identify the conditions for conducting a significance test. Verify that all the conditions are met
c) Carry out the inference procedure and interpret your results

Question 2)

Eleven percent of the products produced by an industrial process over the past several months fail to conform to the specifications. The company modifies the process in an attempt to reduce the rate of nonconformities. In a trial run, the modified process produces 16 nonconforming items out of a total of 300 produced.

Do these results demonstrate that the modifications is effective? Support your conclusions with a test of significance.

Question #3) A basketball player usually makes 53.3% of his freethrows. In the offseason, the player works on his shot and made 26 out of 39 free throws.

a) Do these results provide evidence the player has significantly improved his free throw shooting. Justify your answer with appropriate evidence
b) Describe a Type I error and Type II error in this situation
c) Suppose the player actually improves his free throw percentage to 60%. What is the probability that you will correctly reject the claim that p=0.533? Use a 5% significance level.
d) Find the probability of a Type I error and Type II error

Question #4) Each of 50 subjects tastes two unmarked cups of coffee and says which he or she prefers. One cup in each pair contains instant coffee; the other, fresh brewed coffee. 31 of the subjects prefer fresh brewed coffee. Take "p" to be the proportion of the population who would prefer fresh brewed coffee in a blind tasting test.

a) Test the claim that a majority of people prefer the taste of fresh brewed coffee. Is your result significant at the 5% level What is your practical conclusion?
b) Find a 90% confidence interval for “p”
c) When you do an experiment like this, in what order should you present the two cups of coffee to the subjects?