

Chapter 12.2 Homework  
ALL FULL PROCESSES!

- 1) In a consumer taste test, a random sample of 100 regular Pepsi drinkers are given blind taste of Coke and Pepsi; 48 of these subjects **preferred Coke**.
  - a. a. Give a 90% confidence interval for the percent of consumers **who still prefer Pepsi**.
  - b. At the 10% level of significance, write a pair of hypotheses and then use your confidence interval to test the claim that ~~Coke~~ **PEPSI** is preferred by 50% of Pepsi drinkers who participate in such blind taste tests.
  - c. How large a sample would be needed to reduce the margin of error for part "a" to 1%?
  
- 2) According to the article "Which Adults Do Underage Youth Ask for Cigarettes?" 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 more than 30% of 18-19 year olds are asked to buy cigarettes for underage smokers?
  
- 3) Mrs. Skaff is running against Ryker for President of the United States. Data from an exit poll shows 53% of voters voting for Mrs. Skaff. The exit poll asked a total of 1,500 voter. Pretend the electoral college does not exist and a candidate only needs a simple majority to win the presidency. Do we have evidence at the 5% level of significance that Mrs. Skaff is going to be the next president of the United States?
  
- 4) Mrs. Skaff believes that chin-ups are much easier than pull-ups. To test her claim, she decides to take her students out on two different days, have them complete chin-ups and pull-ups, and then compare the differences in their totals. She has a total of 62 students.
  - a. Describe how randomization should play a role in her study design.
  - b. Describe another way that Mrs. Skaff could have designed her experiment (still using matched-pairs!)
  - c. Mrs. Skaff finds that the mean difference ( $\#chin\text{-}ups - \#pull\text{-}ups$ ) is 2.5. The standard deviation of the differences is 5.104 <- this is the standard deviation of the difference of the sample data. Does she have evidence to support her claim?
  
- 5) Rachel has started a company manufacturing love potions. For quality control purposes, she routinely analyzes bottles from each batch of her potions to verify the concentration of the active ingredient. If the concentration is too high, the product results in unhealthy obsession. If the concentration is too low, the product does not work. The ingredient should be present at a concentration of 0.79 grams per liter. The distribution of the concentrations is known to be Normal, with a standard deviation of 0.0068 grams per liter. Rachel test 10 random bottles of her potions from her most recent batch and gets the following concentrations:  
0.82 0.83 0.80 0.82 0.79 0.81 0.71 0.72 0.88 0.76

Is there evidence that the concentration of the concentration of the active ingredient in this batch is not .79?

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