HW #33: Confidence Intervals

1.) Mr. Young wants to find the average height of all residents of Providence. To do so Mr. Young takes a simple random sample of 250 residents and measures their height. The average height of these residents is

x = 68.7 inches. It is known that the heights of these residents is normally distributed with a standard deviation (population) of σ = 1.62 inches.

a.) Find a 95% confidence interval for the average height (μ) of Providence residents? What is the margin of error?

b.) Interpret Your Results:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2.) When ten cars of a new model are tested for gas mileage, the results showed a mean of 27.2 miles per gallon with a standard deviation (s) of 1.8 miles per gallon. Compute a 95% confidence interval for the true mean of the gas mileage for this particular car? (assume the data is normally distributed).

What are the degrees of freedom?

3.) Coca Cola conducted a study to see if people preferred Regular Coke or Coke Zero. They sampled 150 people and 62% said that they preferred Regular Coke. What can Coca Cola conclude from his survey? (Find a 95% confidence interval for the percent of the population that prefers Regular Coke to Coke Zero)

4.) Mr. Young decides to do a study to see if students like the lunches at Moses Brown. He conducted a SRS of 40 students and 18 said yes, they like the lunches. What can Mr. Young conclude from his survey? (Find a 95% confidence interval for the percent of students that like the lunches at Moses Brown)

5.) ROLL A DICE 25 times (you can go online and find a program that will roll a dice for you). Count the number of times that it lands on the number 6. Construct a 95% confidence interval for the true percent chance that a die will land on the number 6 when rolled. Remember this is a proportion problem!

6.) Use your data from the pulse of the class (HW 32). Write down the sample mean and sample standard deviation that you calculated. Construct a 95% confidence interval for the true mean of the junior class pulse at MB (you will need to use the t-table because it is a sample).

Part c of problem #1: Look back to problem #1.

c.) BONUS (optional) - **SAMPLE SIZE:** Find the sample size necessary for a 95% confidence level with a maximal error of estimate E = 1.0 inches for the mean height of ALL Providence residents. (i.e. solve for n. How many people