

## Chapter 8 FRQ Review

Name \_\_\_\_\_

1. How much do the volumes of bottles of water vary? A random sample of 50 “20 oz” water bottles is collected and the contents are measured. A 90% confidence interval for the population mean  $\mu$  is 19.10 to 20.74.

a. Interpret the confidence interval in context.

b. Interpret the confidence level in context.

c. Based on this interval, what can you say about the contents of the bottles in the sample? What can you say about the contents of bottles in the population?

2. A large company is interested in developing a new bake ware product for consumers. In an effort to determine baking habits of adults, a researcher selects a random sample of 50 addresses in a large, Midwestern, metropolitan area. She calls each selected home in the late morning to collect information on their baking habits. The proportion of adults who bake at least twice a week is calculated and a 90% confidence interval is constructed.

Discuss whether or not each of the conditions for constructing a confidence interval has been met. If any have not been met, discuss the implications on the interpretation of the interval.

3. According to a recent study, not everyone can roll their tongue. A researcher observed a random sample of 300 adults and found 68 who could roll their tongue. Use the four-step process to construct and interpret a 90% confidence interval for the true proportion of adults who can roll their tongue.

4. A researcher would like to estimate the proportion of adults who can roll their tongues. However, unlike the previous example, she'd like the estimate to be within 2% at a 95% confidence level. How large a sample is needed?

5. Use the  $t$  table to determine the critical value  $t^*$  that you would use for a confidence interval for a population mean  $\mu$  in the following situations:

a. An 80% confidence interval from a sample with size  $n = 19$

b. A 95% confidence interval from 248 degrees of freedom

c. A 99% confidence interval for a sample with size  $n = 30$

6. The amount of sugar in soft drinks is increasingly becoming a concern. To test sugar content, a researcher randomly sampled 8 soft drinks from a particular manufacturer and measured the sugar content in grams/serving. The following data were produced:

26    31    23    22    11    22    14    31

Use these data to construct and interpret a 95% confidence interval for the mean amount of sugar in this manufacturer's soft drinks.

7. A researcher would like to estimate the mean amount of time it takes to accomplish a particular task. A previous study indicates the time required varies in the populations with a standard deviation of 4 seconds. He would like to estimate the true mean time within 0.5 seconds at 95% confidence. How large a sample is needed?