
Chapter 7 Exercises

1. A soft-drink machine is regulated so that the amount of drink dispensed is approximately normally distributed with a standard deviation equal to 1.5 deciliters. A random sample of 36 drinks had an average content of 22.5 deciliters.
 - a. Construct a 95% confidence interval estimate for the mean of all drinks dispensed by this machine.
 - b. Give a practical interpretation for the interval estimate you obtained in part (a).
 - c. Determine how large a sample is needed if we wish to be 95% confident that our estimate will be within 0.1 deciliters of the true mean?
 - d. Construct a 99% confidence interval estimate for the mean of all drinks dispensed by this machine. Interpret your answer.
 - e. Determine how large a sample is needed if we wish to be 99% confident that our estimate will be within 0.1 deciliters of the true mean?
2. The contents of 10 similar containers of a commercial soap are 10.2, 9.7, 10.1, 10.3, 10.1, 9.8, 9.9, 10.4, 10.3, and 9.8 liters. Assume that these values come from a normal population.

- a. Find a 95% confidence interval for the mean soap content of all such containers. Interpret your answer.
 - b. Find a 99% confidence interval for the mean soap content of all such containers. Interpret your answer.
- 3. In the Federal Trade Commission (FTC) “Price Check” study of electronic checkout scanners, the FTC inspected 1,669 scanners at retail stores and supermarkets by scanning a sample of items at each store and determining if the scanned price was accurate. The FTC gives a store a “passing grade” if 98% or more of the items are priced accurately. Of the 1,669 stores in the study, 1,185 passed inspection.
 - a. Find a 90% confidence interval for the true proportion of retail stores and supermarkets with electronic scanners that pass the FTC price-check test. Interpret your result.
 - b. Two years prior to the study, the FTC found that 45% of the stores passed inspection. Use the interval you obtained in part (a) to determine whether the proportion of stores that now pass inspection exceeds 45%.
 - c. Determine the sample size need to have a margin of error of at most 0.01.