

Answer each question.

1. What is the difference between a point estimate and an interval estimate?

2. What is margin of error?

3. How do know when to use the standard normal distribution or when to use a t-distribution to construct a confidence interval for the population mean?

Solve each problem. Show all work and box al final answers.

4. The data set represents the weights (in pounds) of 10 randomly selected black bears from northwest Alaska. Assume the weights are normally distributed.
170, 220, 180, 132, 301, 195, 270, 176, 205, 297
 - a. Find the sample mean and sample standard deviation. EXPLAIN how you found each.

 - b. Construct a 95% confidence interval for the population mean. Interpret the results.

 - c. Construct a 99% confidence interval for the population mean. Interpret the results.

5. The data set represents the scores of 12 randomly selected students on the SAT Physics Subject Test. Assume the population test scores are normally distributed and the population standard deviation is 104.

590, 450, 490, 680, 380, 500, 570, 620, 640, 530, 780, 720

- a. Find the point estimate of the population mean. Show work.

- b. Construct a 90% confidence interval for the population mean. Interpret the results.

- c. Does it seem possible that the population mean could equal 667? Explain.

- d. Does it seem possible that the population mean could be within 5% of the sample mean? Explain.

- e. Determine the minimum sample size required to be 95% confident that the sample mean test score is within 10 points of the population mean test score.

6. **Tell** whether you would use the standard normal distribution or the t-distribution to construct a confidence interval for the population mean of each data set. **Justify your decision.** If neither distribution can be used, **explain why.**

a. In a random sample of 50 patients, the mean waiting time at a dentist's office was 20 minutes and the standard deviation was 7.5 minutes.

b. In a random sample of 17 cracker boxes, the mean weight was 11.12 ounces. Assume the weights of the cracker boxes are normally distributed and the population standard deviation is 0.04 ounce.

c. The gas mileages (in miles per gallon) of 10 randomly selected sports cars are listed. Assume the mileages are not normally distributed.

21, 30, 19, 20, 21, 24, 18, 24, 27, 20