

Confidence Intervals: Means

1. Use a calculator or the t table to estimate the following:
  - a. The critical value of t for a 90% confidence interval with  $df = 17$
  - b. The critical value of t for a 98% confidence interval with  $df = 88$
  - c. The critical value of t for a 95% confidence interval with  $df = 7$
  - d. The critical value of t for a 99% confidence interval with  $df = 102$
  
2. Given the following information, construct the appropriate confidence interval. Show calculations.
  - a.  $\bar{x} = 32$ ,  $s_x = 3$ ,  $n = 25$ ,  $C = 95\%$
  
  - b.  $\bar{x} = 55.7$ ,  $s_x = 1.2$ ,  $n = 100$ ,  $C = 99\%$
  
  - c.  $\bar{x} = 98.285$ ,  $s_x = 0.6824$ ,  $n = 52$ ,  $C = 90\%$
  
3. Describe how the shape, center, and spread of the t distribution change as the number of degrees of freedom increases.

4. In 1998, as an advertising campaign, the Nabisco Company announced a “1000 Chips Challenge,” claiming that every 18-ounce bag of their Chips Ahoy cookies contained at least 1000 chips. Dedicated Statistics students at the Air Force Academy purchased some randomly selected bags of cookies and counted the chocolate chips. Their data is shown below:

1219 1214 1087 1200 1419 1121 1325 1345  
1244 1258 1356 1132 1191 1270 1295 1135

- a. Create and interpret a 95% confidence interval for the average number of chips in bags of Chips Ahoy cookies.

- b. Interpret the confidence level in context. What does it suggest about Nabisco's claim?

5. Hoping to lure more shoppers downtown, a city builds a new public parking garage in the central business district. The city plans to pay for the structure through parking fees. During a two-month period (44 workdays), daily fees collected averaged \$126, with a standard deviation of \$15.

a. Construct and interpret a 90% confidence interval for the mean daily income this parking garage will generate.

b. Interpret the confidence level.

c. The consultant who advised the city on this project predicted that parking revenues would average \$130 per day. Based on your confidence interval, do you think that the consultant was correct? Why?