Confidence Intervals. ***In Exercises 9–24, construct the confidence interval.***

9. Earthquake Depths Data Set 16 in Appendix B lists the depths (km) of a sample of 50 earthquakes. Those 50 depths have a mean of 9.808 km and a standard deviation of 5.013 km. Construct a 98% confidence interval estimate of the mean of all such depths. Is the confidence interval affected by the fact that the data appear to be from a population that is not normally distributed? (*Hint:* If using Table A-3 to find the critical value $t_{\alpha/2}$, that table does not include 49 degrees of freedom, so use the closest value for 50 degrees of freedom.)

10. Mercury in Sushi Listed below are the amounts of mercury (in parts per million, or ppm) found in tuna sushi sampled at different stores in New York City. The study was sponsored by the *New York Times,* and the stores (in order) are D'Agostino, Eli's Manhattan, Fairway, Food Emporium, Gourmet Garage, Grace's Marketplace, and Whole Foods. The sample mean is 0.719 ppm and the standard deviation is 0.366 ppm. Construct a 90% confidence interval estimate of the mean amount of mercury in the population.

0.56 0.75 0.10 0.95 1.25 0.54 0.88

11. CEO Compensation Listed below are the recent annual compensation amounts (in thousands of dollars) for a random sample of chief executive officers (Mulally from Ford, Jobs from Apple, Kent from Coca-Cola, Otellini from Intel, and McNerney from Boeing). The mean of the sample is 12,898 (thousand dollars) and the standard deviation is 7719 (thousand dollars). Construct a 95% confidence interval estimate of the mean of the population of all such chief executive officers. Is there anything notable about the sample data that might have an effect on the result?

17,688 0.001 19,629 12,408 14,765

12. Chocolate Chip Cookies The Chapter Problem for Chapter 3 includes the numbers of chocolate chips in a sample of 40 Chips Ahoy regular cookies. The mean is 23.95 chocolate chips and the standard deviation is 2.55 chocolate chips. Construct a 99% confidence interval estimate of the mean number of chocolate chips in all such cookies. How does the confidence interval not contradict the fact that most of the original values do not fall between the confidence interval limits?

13. Mean Body Temperature Data Set 3 in Appendix B includes a sample of 106 body temperatures having a mean of 98.20°F and a standard deviation of 0.62°F. Construct a 95% confidence interval estimate of the mean body temperature for the entire population. What does the result suggest about the common belief that 98.6°F is the mean body temperature?

14. Atkins Weight Loss Program In a test of weight loss programs, 40 adults used the Atkins weight loss program. After 12 months, their mean weight *loss* was found to be 2.1 lb, with a standard deviation of 4.8 lb. Construct a 90% confidence interval estimate of the mean weight loss for all such subjects. Does the Atkins program appear to be effective? Does it appear to be practical?

15. Garlic for Reducing Cholesterol In a test of the effectiveness of garlic for lowering cholesterol, 49 subjects were treated with raw garlic. Cholesterol levels were measured before and after the treatment. The changes (before minus after) in their levels of LDL cholesterol (in mg/dL) had a mean of 0.4 and a standard deviation of 21.0 (based on data from "Effect of Raw Garlic vs Commercial Garlic Supplements on Plasma Lipid Concentrations in Adults with Moderate Hypercholesterolemia," by Gardner et al., *Archives of Internal Medicine,* Vol. 167). Construct a 98% confidence interval estimate of the mean net change in LDL cholesterol after the garlic treatment. What does the confidence interval suggest about the effectiveness of garlic in reducing LDL cholesterol?

16. Insomnia Treatment A clinical trial was conducted to test the effectiveness of the drug zopiclone for treating insomnia in older subjects. Before treatment with zopiclone, 16 subjects had a mean wake time of 102.8 min. After treatment with zoplicone, the