

12. **Parking.** 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 weekdays), daily fees collected averaged \$126, with a standard deviation of \$15.
- What assumptions must you make in order to use these statistics for inference?
 - Write a 90% confidence interval for the mean daily income this parking garage will generate.
 - Explain in context what this confidence interval means.
 - Explain what "90% confidence" means in this context.
 - 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 the consultant could have been correct? Why?

- 14. Parking II.** Suppose that for budget planning purposes the city in Exercise 12 needs a better estimate of the mean daily income from parking fees.
- a) Someone suggests that the city use its data to create a 95% confidence interval instead of the 90% interval first created. How would this interval be better for the city? (You need not actually create the new interval.)
 - b) How would the 95% interval be worse for the planners?
 - c) How could they achieve an interval estimate that would better serve their planning needs?
 - d) How many days' worth of data must they collect to have 95% confidence of estimating the true mean to within \$3?

- 25. Marriage.** In 1960, census results indicated that the age at which American men first married had a mean of 23.3 years. It is widely suspected that young people today are waiting longer to get married. We want to find out if the mean age of first marriage has increased during the past 40 years.
- Write appropriate hypotheses.
 - We plan to test our hypothesis by selecting a random sample of 40 men who married for the first time last year. Do you think the necessary assumptions for inference are satisfied? Explain.
 - Describe the approximate sampling distribution model for the mean age in such samples.
 - The men in our sample married at an average age of 24.2 years with a standard deviation of 5.3 years. What's the P-value for this result?
 - Explain (in context) what this P-value means.
 - What's your conclusion?

7. **Meal plan.** After surveying students at Dartmouth College, a campus organization calculated that a 95% confidence interval for the mean cost of food for one term (of three in the Dartmouth trimester calendar) is (\$780, \$920). Now the organization is trying to write its report, and considering the following interpretations. Comment on each.
- a) 95% of all students pay between \$780 and \$920 for food.
 - b) 95% of the sampled students paid between \$780 and \$920.
 - c) We're 95% sure that students in this sample averaged between \$780 and \$920 for food.
 - d) 95% of all samples of students will have average food costs between \$780 and \$920.
 - e) We're 95% sure that the average amount all students pay is between \$780 and \$920.