3.2.1

In an effort to estimate the mean amount spent per customer for dinner at a major Atlanta restaurant, data were collected for a sample of 49 customers. Assume a population standard deviation of $5.

a) At 95% confidence, what is the margin of error?

b) If the sample mean is $24.80, what is the 95% confidence interval for the population mean?

3.2.2

The Wall Street Journal reported that automobile crashes cost the United States $162 billion annually (The Wall Street Journal, March 5, 2008). The average cost per person for crashes in the Tampa, Florida, area was reported to be $1,599. Suppose this average cost was based on a sample of 50 persons who had been involved in car crashes and that the population standard deviation is $\sigma = 600$

a) What is the margin of error for a 95% confidence interval?

b) What would you recommend if the study required a margin of error of $150 or less?

3.2.3

The National Quality Research Center at the University of Michigan provides a quarterly measure of consumer opinions about products and services (The Wall Street Journal, February 18, 2003). A survey of 10 restaurants in the Fast Food/Pizza group showed a sample mean customer satisfaction index of 71. Past data indicate that the population standard deviation of the index has been relatively stable with $\sigma = 5$.

a) What assumption should the researcher be willing to make if a margin of error is desired?

b) Using 95% confidence, what is the margin of error?

c) What is the margin of error if 99% confidence is desired?

3.1.4

Playbill magazine reported that the mean annual household income of its readers is $119,155 (Playbill, January 2006). Assume this estimate of the mean annual household income is based on a sample of 80 households, and based on past studies, the population standard deviation is known to be $\sigma = \$30,000$.

a) Develop a 90% confidence interval estimate of the population mean.

b) Develop a 95% confidence interval estimate of the population mean.

c) Develop a 99% confidence interval estimate of the population mean.

d) Discuss what happens to the width of the confidence interval as the confidence level is increased. Does this result seem reasonable? Explain.