Ch 6.4 Determining Sample Size

Name:_____

1. A researcher wants to estimate the mean of a population by taking a random sample and computing the sample mean. He wants to be 95 percent confident that the maximum error of the estimate is 2. If the population standard deviation is 20, how many observations need to be included in the sample?

2. An experimenter is investigating a population of measurements whose range is about 50. She will use the mean of a random sample to estimate the population mean. How large must the sample size be if she wants to be 99 percent confident that the error will be at most 2?

3. A state's fish and game commission wants to estimate the mean number of fish caught this year during the fishing season. From previous surveys, it estimates that the standard deviation will be about 10. How many license holders will need to be surveyed if the commission wants the sample mean to be off from the true mean by at most 2 with 95 percent confidence?

4. A newspaper reporter is preparing a story on automobile inspection stations, and she wants to estimate the average cost of a state inspection (excluding the cost of repairs). She believes that costs will vary from $10 to $25. How many inspection stations should be surveyed if she wants the error of the estimate to be at most $1 with 95 percent confidence?

5. Consistent with the trend toward fewer children and more single-parent families, the U.S. Census Bureau reported that the average size of households declined to a record low in 1989. In order for the estimate of the average size to be in error by at most 0.1 with confidence 95 percent, how many families would have to be surveyed? Assume that $\sigma = 1.5$.

Create a confidence interval without a calculator for the following.

6. The U.S. Department of Education claims that the average teacher puts in 50-hour work week. Suppose a superintendent of schools wants to estimate the average work week of teachers in his district. 25 teachers are randomly selected, and it is found that they work on average 52.7 hours a week. The standard deviation is 4.2 hours. Estimate with 95% confidence the mean work week of teaches in his district.

7. A coffee company has decided to use the vacuum brick method instead of cans. To check its new packaging equipment, it takes 31 packages and obtains a sample mean of 13.36 ounces and a standard deviation of 0.22 ounces. Construct a 99% confidence interval to estimate the actual mean weight of packages filled by this machine.

8. A normal pregnancy and hospital delivery now costs and average of $4,334 (1990). To see how charges in a particular state compare to this figure, a sample of 29 recent births was investigated. The mean cost was $4,725 and standard deviation was $197. Construct a confidence interval with 90% confidence to estimate the true mean of a normal delivery in this state.

9. A sample of 35 patients at an alcohol rehab center revealed that the average stay is 27.8 days with a standard deviation of 3.2 days. Estimate with 95% confidence the mean length of a stay for a patient at this center.

10. The survey of 15 plumbers in midwestern state revealed the following hourly rate. Create a confidence interval for the average hourly rate charged by plumbers in this sate at 95%.

18.50	17.50	17.50	16.00	17.00	15.00	16.00	15.50
15.00	18.00	18.50	15.50	17.00	17.50	19.00	