College Prep Stats
Extra Practice 8.5

5. Do the Screws Have a Length of 3/4 in.? A simple random sample of 50 stainless steel sheet metal screws is obtained from those supplied by Crown Bolt, Inc., and the length of each screw is measured using a vernier caliper. The lengths are listed in Data Set 19 of Appendix B. The sample mean length is 0.7468 in. and sample standard deviation of all such lengths is 0.0123 in. Use a 0.05 significance level to test the claim that the screws have a mean length equal to 3/4 in. (or 0.75 in.), as indicated on the package labels. Do the screw lengths appear to be consistent with the package label?

6. Power Supply Data Set 13 in Appendix B lists measured voltage amounts supplied directly to the author's home. The Central Hudson power supply company states that it has a target power supply of 120 volts. Those home voltage amounts have a sample mean is 123.6625 volts and assuming that the standard deviation of all voltage amounts is 0.24 V, test the claim that the mean voltage is 120 volts. Use a 0.01 significance level.

7. The high school athletic director is asked if football players are doing as well academically as the other student athletes. We know from a previous study that the average GPA for the student athletes is above 3.10. After an initiative to help improve the GPA of student athletes, the athletic director took a simple randomly samples of 40 football players and finds that the average GPA of the sample is 3.18 with a sample standard deviation of 0.54. Is there a significant improvement? Use a 0.05 significance level.

8. Duracell manufactures batteries that the CEO claims will last an average of 300 hours under normal use. A researcher randomly selected 35 batteries from the production line and tested these batteries. The tested batteries had a mean life span of 270 hours with a standard deviation of 50 hours. Do we have enough evidence to suggest that the claim of an average lifetime of 300 hours is false?