1. **Study all quizzes and hand-in homework for chapter 7&8.**

2. In planning for hot water requirements, the manager of a hotel finds that the expected amount of time that a guest spends in the shower each day is 11.46 min. Assume that the shower times are Normal with a standard deviation of 2.7 min.
   a. What is the probability that a random guest will shower more than 12 min?
   b. If 36 guests are selected randomly, what is the probability that the average shower time for this sample will be more than 12 min?

3. Assume that cans of Diet Sprite are filled by a machine with a mean of 12.193oz and a standard deviation of 0.55oz. If a sample of 35 cans is selected, find the approximate probability that their average will be at least 12oz.

4. According to Mars (the candy company) 20% of M&M plain candies are orange. If we choose a random sample of 100 plain M&Ms, estimate the probability of observing more than 25 that are orange.

5. High school dropouts make up 12.3% of all Americans aged 18-24. A vocational school that wants to advertise decides to mail a flier to 25,000 randomly selected people between the ages of 18-24.
   a. The vocational school can expect to reach how many of high-school drop outs with their flier?
   b. What is the approximate probability that at least 3500 dropouts will receive the flyer?

6. There are 20 multiple choice questions on an exam each having responses a, b, c, and d. Students will score an “B” if they get at least 14 questions correct. If a student simply guesses on the exam, what is the probability that he or she will score an “B”?

7. A car dealership is interested in finding out how many people are considering buying a new car. How many people must be surveyed so they can be 99% confident that the sample proportion is within three percentage points of the true proportion?

8. A researcher wants to study the mean amount of time (in minutes) that kindergartners spend watching TV each day. Find the sample size necessary to estimate the mean with a 10-min margin of error. Assume that a 90% confidence level is desired and that a pilot study showed that the standard deviation is estimated to be 44min.

9. 40 divorced individuals were surveyed regarding how long their first marriage lasted. The mean was found to be 5.7 years. Assuming \( \sigma \) is known to be 2.2 years, construct a 95% confidence interval estimate of the population mean.

10. A veterinarian is studying the level of lead in blood. A sample from fifty dogs yields a mean of 2.76 \( \mu g/dl \) and a standard deviation of .078 \( \mu g/dl \). Construct a 99% confidence interval estimate for the population mean.

11. If a sample of 140 pumpkins has a mean weight of 8lbs and a standard deviation of 1.4lbs, find a 99% confidence interval for population mean weight.

12. In a poll last year from 1025 randomly selected adults, 322 of them said that they used the Internet for shopping at least 5 times during the past year. Find a 90% confidence interval estimate of the proportion of people who actually use the Internet for shopping.

13. A milk dispensing machine is supposed to dispense 32oz per container. The machine needs to be adjusted if the true standard deviation of the amount per container is greater than 0.75oz. A sample of 8 containers gave the following results: \( \bar{x} = 32.088 \) and \( s = 0.7568 \). Using a significance level of .05, test whether or not the machine needs to be adjusted.
For the following problems:

1. State $H_0$, $H_1$.
2. Find the critical value and state the rejection region.
3. Find the test statistic and determine if it is in the rejection region.
4. Find the p-value.
5. Write your conclusion is a complete sentence.

14. A study is trying to prove that the number of SUVs on the road is increasing. At a certain intersection it was observed that 13% of 900 vehicles were SUVs. Using a significance level of 0.05, test the claim that the proportion of SUVs are increasing from the national average of 10%.

15. A tire manufacturer tests 16 of its tires and finds a mean of 39,200 miles and a standard deviation of 8,200 miles. Use a significance level of .01, to test the claim that their tires last longer than the industry average of 38,000 miles.

16. A cigarette manufacturer measures the nicotine content in a particular brand of cigarettes. A sample of 21 cigarettes yields a mean of 22.4; it is known that the population standard deviation is $\sigma = 3.4$. Using a significance level of 0.05, test the claim that this brand of cigarettes has a different mean nicotine content than the national average of 24.

17. Quarters are minted with weights having a mean of 5.522 and a standard deviation of 0.062. New equipment is being tested in an attempt to reduce variation and improve quality. A random sample of 20 quarters obtained from the new equipment was found to have a standard deviation of 0.047. Use a 0.025 significance level to test the claim that the quarters from the new machine have less variation.