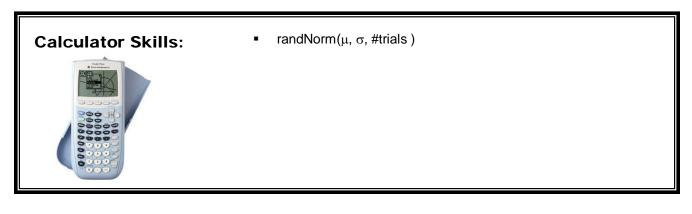
# **Chapter 9: Sampling Distributions**

## **Key Vocabulary:**

- parameter
- statistic
- sampling variability
- sampling distribution
- unbiased
- central limit theorem
- law of large numbers





### 9.1 Sampling Distributions (pp.562-580)

- 1. Explain the difference between a *parameter* and a *statistic*?
- 2. What is *sampling variability*?
- 3. Explain the difference between  $\mu$  and  $\overline{x}$ , and between p and  $\hat{p}$ ?
- 4. What is meant by the *sampling distribution* of a statistic?
- 5. When is a statistic considered *unbiased*?
- 6. How is the size of a sample related to the *spread* of the sampling distribution?

#### 9.2 Sample Proportions (pp.581-589)

- 1. In an SRS of size *n*, what is true about the sampling distribution of  $\hat{p}$  when the sample size *n* increases?
- 2. In an SRS of size *n*, what is the mean of the sampling distribution of  $\hat{p}$ ?
- 3. In an SRS of size *n*, what is the standard deviation of the sampling distribution of  $\hat{p}$ ?
- 4. What happens to the standard deviation of  $\hat{p}$  as the sample size *n* increases?
- 5. When does the formula  $\sqrt{\frac{p(1-p)}{n}}$  apply to the standard deviation of  $\hat{p}$ ?
- 6. When the sample size *n* is large, the sampling distribution of  $\hat{p}$  is approximately normal. What test can you use to determine if the sample is large enough to assume that the sampling distribution is approximately normal?

### 9.3 Sample Means (pp.591-604)

- 1. The mean and standard deviation of a population are *parameters*. What symbols are used to represent these *parameters*?
- 2. The mean and standard deviation of a sample are *statistics*. What symbols are used to represent these *statistics*?
- 3. Because averages are less variable than individual outcomes, what is true about the standard deviation of the sampling distribution of  $\overline{x}$ ?
- 4. What symbols are used to represent the mean and standard deviation of the sampling distribution of  $\overline{x}$ ?
- 5. What is the mean of the sampling distribution of  $\overline{x}$ , if  $\overline{x}$  is the mean of an SRS of size *n* drawn from a large population with mean  $\mu$  and standard deviation  $\sigma$ ?
- 6. What is the standard deviation of the sampling distribution of  $\overline{x}$ , if  $\overline{x}$  is the mean of an SRS of size *n* drawn from a large population with mean  $\mu$  and standard deviation  $\sigma$ ?
- 7. To cut the standard deviation of  $\overline{x}$  in half, you must take a sample \_\_\_\_\_ times as large.
- 8. When should you use  $\frac{\sigma}{\sqrt{n}}$  to calculate the standard deviation of  $\overline{x}$ ?
- 9. What does the **Central Limit Theorem** say about the shape of the sampling distribution of  $\overline{x}$ , no matter what shape the population distribution has?