# Chapter 5: Probability: What are the chances?

### **Key Vocabulary:**

- Iaw of large numbers
- probability
- simulation
- two -way table
- sample space
- S = {H, T}
- tree diagram
- probability model
- replacement

- event
- P(A)
- complement A<sup>C</sup>
- disjoint
- mutually exclusive event
- Venn diagram
- union (or)
- intersection (and)
- conditional probability



- independent events
- general multiplication rule
- general addition rule
- multiplication rule

## 5.1 Randomness, Probability, and Simulation (pp.282-292)

- 1. What is the *law of large numbers?*
- 2. The *probability* of any outcome...
- 3. How do you interpret a probability?
- 4. Answer the two questions for the Check Your Understanding on page 286.
- 5. What are the two *myths about randomness*? Explain.
- 6. Define *simulation*.
- 7. Name and describe the four steps in performing a simulation:
- 8. What are some common errors when using a table of random digits?

#### 5.2 Probability Rules (pp.299-308)

- 1. In statistics, what is meant by the term *sample space*?
- 2. In statistics, what is meant the term probability model?
- 3. What is an *event*?
- 4. What is the P (A) if all outcomes in the sample space are equally likely?
- 5. Define the *complement* of an event. What is the complement rule?
- 6. Explain why the probability of any event is a number between 0 and 1.
- 7. What is the sum of the probabilities of all possible outcomes?
- 8. Describe the probability that an event does not occur?
- 9. When are two events considered *disjoint* or *mutually exclusive*?

10. What is the *addition rule* for mutually exclusive events?

- 11. What is the probability of two disjoint events?
- 12. Summarize the *five basic probability rules* as outlined on page 302.
- 13. Answer the three questions for *Check Your Understanding* on page 303.
- 14. When is a *two-way* table helpful?
- 15. In statistics, what is meant by the word "or"?
- 16. When can a Venn diagram be helpful?
- 17. What is the *general addition rule* for two events?
- 18. What happens if the general addition rule is used for two mutually exclusive events?

- 19. What does the union of two or more events mean? Illustrate on a Venn diagram.
- 20. What does the intersection of two or more events mean? Illustrate on a Venn diagram.

## 5.3 Conditional Probability and Independence (pp.312-327)

- 1. What is *conditional probability?* What is the *notation* for conditional probability?
- 2. Answer the two questions for the Check Your Understanding on page 314.
- 3. What are *independent events*?
- 4. What is the *notation* used for independent events?
- 5. Answer the three questions for *Check Your Understanding* on page 317.
- 6. When is a *tree diagram* helpful?
- 7. State the *general multiplication rule* for any two events.
- 8. State the *multiplication rule* for independent events.
- 9. How is the *general multiplication rule* different than the *multiplication rule* for independent events?
- 10. Explain the difference between *mutually exclusive* and *independent*.
- 11. State the *formula* for calculating *conditional probabilities*.
- 12. How is the conditional probability formula related to the general multiplication rule?