LESSON 6.4

Exercise Set A

MM1D2a Find the probabilities of mutually exclusive events.

MM1D2b Find the probabilities of dependent events.

MM1D2c Calculate conditional probabilities.

In Exercises 1–4, you draw a card from a bag that contains 4 yellow cards numbered 1–4 and 5 blue cards numbered 1–5. Tell whether the events *A* and *B* are *mutually exclusive* or *overlapping*. Then find *P*(*A* or *B*).

1. **Event *A*:** You choose a card with an even number.
Event *B*: You choose a number 4 card.

2. **Event *A*:** You choose a yellow card.
Event *B*: You choose a number 5 card.

3. **Event *A*:** You choose a blue number 3 card.
Event *B*: You choose a blue card.

4. **Event *A*:** You choose a card with an odd number.
Event *B*: You choose a blue card.

In Exercises 5 and 6, tell whether the events *A* and *B* are *dependent* or *independent*. Then find *P*(*A* and *B*).

5. A bag contains 6 red balls and 5 green balls. You randomly draw one ball, replace it, and randomly draw a second ball.
Event *A*: The first ball is green.
Event *B*: The second ball is green.

6. You write each of the letters of the word BRILLIANT on pieces of paper and place them in a bag. You randomly draw one letter, do not replace it, then randomly draw a second letter.
Event *A*: The first letter is an L.
Event *B*: The second letter is a T.

7. **Eating Habits** A survey of 500 students in a school found that about 100 households consist of only vegetarians, 240 consist of vegetarians and non-vegetarians, and 160 consist of only non-vegetarians.

a. What is the probability that one of the households surveyed, chosen at random, consists of only vegetarians or only non-vegetarians?

b. What is the probability that one of the households surveyed, chosen at random, consists of vegetarians and non-vegetarians?

c. *Explain* how your answers to parts (a) and (b) are related.

8. **Coordinating Time** You study with a group for an upcoming math competition on Mondays, Tuesdays, and Thursdays. You volunteer at a hospital on Mondays, Wednesdays, and Thursdays.

a. Make a Venn diagram that shows the days of the week that you participate in each activity.

b. Your class is taking a field trip that could be scheduled for any day of the week (Monday through Friday). Find the probability that it is scheduled for a day when you are studying with your group or are volunteering.

LESSON 6.4

Exercise Set B

MM1D2a Find the probabilities of mutually exclusive events.

MM1D2b Find the probabilities of dependent events.

MM1D2c Calculate conditional probabilities.

In Exercises 1–4, you draw a card from a bag that contains 6 yellow cards numbered 1–6 and 5 blue cards numbered 1–5. Tell whether the events *A* and *B* are *mutually exclusive* or *overlapping*. Then find *P*(*A* or *B*).

1. **Event *A*:** You choose a blue card.
   Event *B*: You choose a number 6 card.

2. **Event *A*:** You choose a blue card.
   Event *B*: You choose a card with a prime number.

3. **Event *A*:** You choose a yellow card.
   Event *B*: You choose a card with an odd number.

4. **Event *A*:** You choose a card with an odd number.
   Event *B*: You choose a blue card.

In Exercises 5 and 6, tell whether the events *A* and *B* are *dependent* or *independent*. Then find *P*(*A* and *B*).

5. A bag contains 4 red balls, 3 yellow balls, and 6 green balls. You randomly draw one ball, replace it, and randomly draw a second ball.
   Event *A*: The first ball is green.
   Event *B*: The second ball is yellow.

6. You write each of the letters of the word MASTERMIND on pieces of paper and place them in a bag. You randomly draw one letter, do not replace it, then randomly draw a second letter.
   Event *A*: The first letter is an N.
   Event *B*: The second letter is an M.

7. **Multiple Representations** You practice with your debate team on Tuesdays, Wednesdays, and Thursdays. You volunteer at a food kitchen on Mondays, Wednesdays, and Fridays.
   a. Making a Table Make a table that shows your schedule for the week.
   b. Drawing a Diagram Make a Venn diagram that shows the days of the week that you participate in each activity.
   c. Using a Formula Your class is taking a field trip that could be scheduled for any day of the week (Monday through Friday). Find the probability that it is scheduled for a day when you are practicing with the debate team or are volunteering.

8. **Driving** You and five friends have rented a minivan for a road trip. To decide who will drive the first leg of the trip, you place 6 slips of paper in a bag, each of which is labeled with the position in the minivan. Everyone chooses a slip of paper from the bag at random.
   a. What is the probability that you will have to drive?
   b. What is the probability that you will have to drive and your best friend will be in the passenger seat next to you?
   c. *Explain* how you could solve the problem in part (b) by using permutations.