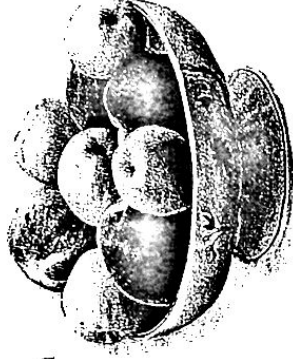


EXERCISES

Practice

Determine if the events are *independent* or *dependent*. Then find the probability.

- There are 3 glasses of diet cola and 5 glasses of regular cola on the counter. Susan drinks 2 of them at random. What is the probability that she drank 2 glasses of diet cola?
- A bowl contains 4 peaches and 5 apricots. Monica randomly selects one, puts it back, and then randomly selects another. What is the probability that both selections were apricots?
- When Tricia plays her video game, the odds are 3 to 4 that she will reach the highest level of the game. What is the probability that she will reach the highest level the next four games?

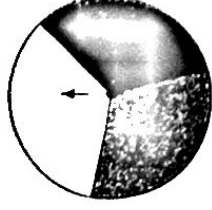


The tiles **A, B, G, I, M, R, and S** of a word game are placed face down in the lid of the game. If two tiles are chosen at random, find each probability.

- P (selecting 2 consonants), if replacement occurs
- P (selecting 2 consonants), if no replacement occurs
- P (selecting the same letter twice), if no replacement occurs
- Suppose you roll one red die and one green die and get a sum of 8.
 - List the different ways in which this can occur.
 - Suppose you know the sum is 8 but not the number on each die. Explain why the probability that you rolled two 4s would be $\frac{1}{5}$.

Corinne takes her 3-year-old son into an antique shop. There are 4 statues, 3 picture frames, and 3 vases on a shelf. The 3-year-old accidentally knocks 2 items off the shelf and breaks them. Find each probability.

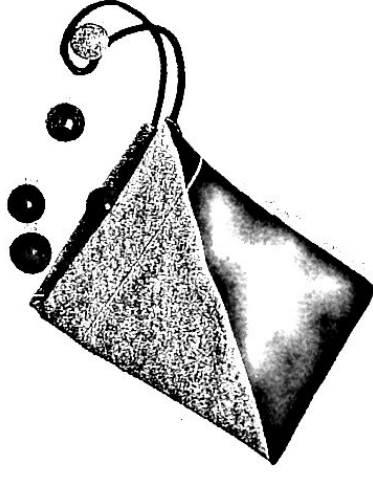
- P (breaking 2 vases)
- P (breaking 2 statues)
- P (breaking a picture frame, then a vase)
- P (breaking a picture frame and a vase)
- Suppose you spin the spinner at the right two times.
 - Sketch a tree diagram showing all of the possibilities and use it to find the probability of spinning a red and then a blue.
 - Sketch an area diagram of the outcomes.
 - Shade the region on your area diagram corresponding to getting the same color twice.
 - What is the probability that you get the same color on both spins?
 - If you know that you got the same color twice, what is the probability that the color was red?



Communicating Mathematics

Study the lesson. Then complete the following.

1. Explain how to find the probability of two independent events.
2. Describe what is meant by *dependent events*.
3. Determine whether events A and B are dependent or independent if a blue die and a red die are rolled and A is the event that the blue die shows 6, and B is the event that the red die shows an even number. Explain your answer.
4. Write an example of two real-life events that are dependent.
5. Examine the problem below and explain your conclusions. You are given a bag containing 10 marbles.
 - a. Ten times you draw a marble, record its color, and put it back. If you don't record any black marbles, can you conclude that there aren't any black marbles in the bag?
 - b. If you do this 50 times and you don't record any black marbles, can you conclude that there aren't any black marbles in the bag?
 - c. How many times do you have to repeat the drawing and replacing of marbles to be absolutely certain that there aren't any black marbles in the bag? Explain.
6. Model the problem in Example 2 using an area diagram.

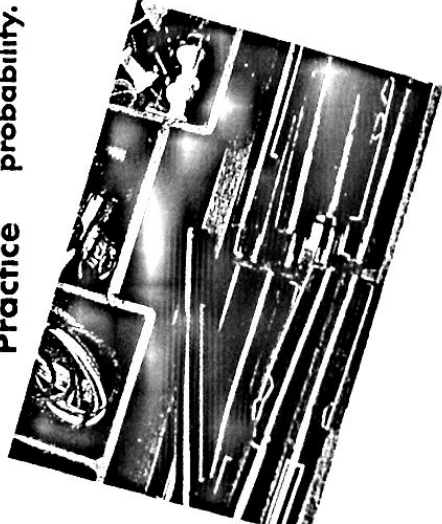


MODELING MATHEMATICS

Guided Practice

Determine if the events are *independent* or *dependent*. Then find the probability.

7. Minal has 7 blue pens, 3 black pens, and 2 red pens in her desk drawer. If she selects three pens at random with no replacement, what is the probability that she will first select a blue pen, then a black pen, and then another blue pen?
8. A green die and a red die are tossed. What is the probability that a 2 shows on the green die and a 6 shows on the red die?
9. José's wallet contains three \$1 bills, four \$5 bills, and two \$10 bills. If three bills are selected in succession, find the probability of selecting one of each if:
 - a. each bill is replaced.
 - b. no bills are replaced.



There are 8 movie videos, 3 exercise videos, and 5 cartoon videos on the shelf. Suppose two videotapes are to be selected at random from the shelf. Find each probability.

10. P (selecting 2 movie videos), if no replacement occurs
11. P (selecting 2 movie videos), if replacement occurs
12. P (selecting an exercise video, then a cartoon video), if no replacement occurs