

**12-4 Practice*****Multiplying Probabilities***

**A die is rolled three times. Find each probability.**

1.  $P(\text{three } 4\text{s})$
2.  $P(\text{no } 4\text{s})$
3.  $P(2, \text{ then } 3, \text{ then } 1)$
4.  $P(\text{three different even numbers})$
5.  $P(\text{any number, then } 5, \text{ then } 5)$
6.  $P(\text{even number, then odd number, then } 1)$

**There are 3 nickels, 2 dimes, and 5 quarters in a purse. Three coins are selected in succession at random. Find the probability.**

7.  $P(\text{nickel, then dime, then quarter}), \text{ if no replacement occurs}$
8.  $P(\text{nickel, then dime, then quarter}), \text{ if replacement occurs}$
9.  $P(2 \text{ nickels, then } 1 \text{ quarter}), \text{ if no replacement occurs}$
10.  $P(3 \text{ dimes}), \text{ if replacement occurs}$
11.  $P(3 \text{ dimes}), \text{ if no replacement occurs}$

**For Exercises 12 and 13, determine whether the events are *independent* or *dependent*. Then find each probability.**

12. Serena is creating a painting. She wants to use 2 more colors. She chooses randomly from 6 shades of red, 10 shades of green, 4 shades of yellow, 4 shades of purple, and 6 shades of blue. What is the probability that she chooses 2 shades of green?
13. Kershel's mother is shopping at a bakery. The owner offers Kershel a cookie from a jar containing 22 chocolate chip cookies, 18 sugar cookies, and 15 oatmeal cookies. Without looking, Kershel selects one, drops it back in, and then randomly selects another. What is the probability that neither selection was a chocolate chip cookie?
14. **METEOROLOGY** The Fadeeva's are planning a 3-day vacation to the mountains. A long-range forecast reports that the probability of rain each day is 10%. Assuming that the daily probabilities of rain are independent, what is the probability that there is no rain on the first two days, but that it rains on the third day?

**RANDOM NUMBERS** For Exercises 15 and 16, use the following information.

Anita has a list of 20 jobs around the house to do, and plans to do 3 of them today. She assigns each job a number from 1 to 20, and sets her calculator to generate random numbers from 1 to 20, which can reoccur. Of the jobs, 3 are outside, and the rest are inside.

15. Sketch a tree diagram showing all of the possibilities that the first three numbers generated correspond to inside jobs or outside jobs. Use it to find the probability that the first two numbers correspond to inside jobs, and the third to an outside job.
16. What is the probability that the number generated corresponds to an outside job three times in a row?

**12-5 Practice****Adding Probabilities**

An urn contains 7 white marbles and 5 blue marbles. Four marbles are selected without replacement. Find each probability.

1.  $P(4 \text{ white or } 4 \text{ blue})$
2.  $P(\text{exactly } 3 \text{ white})$
3.  $P(\text{at least } 3 \text{ white})$
4.  $P(\text{fewer than } 3 \text{ white})$
5.  $P(3 \text{ white or } 3 \text{ blue})$
6.  $P(\text{no white or no blue})$

Jason and Maria are playing a board game in which three dice are tossed to determine a player's move. Find each probability.

7.  $P(\text{two } 5\text{s})$
8.  $P(\text{three } 5\text{s})$
9.  $P(\text{at least two } 5\text{s})$
10.  $P(\text{no } 5\text{s})$
11.  $P(\text{one } 5)$
12.  $P(\text{one } 5 \text{ or two } 5\text{s})$

Determine whether the events are *mutually exclusive* or *inclusive*. Then find the probability.

13. A clerk chooses 4 CD players at random for floor displays from a shipment of 24 CD players. If 15 of the players have a blue case and the rest have a red case, what is the probability of choosing 4 players with a blue case or 4 players with a red case?
14. A department store employs 28 high school students, all juniors and seniors. Six of the 12 seniors are females and 12 of the juniors are males. One student employee is chosen at random. What is the probability of selecting a senior or a female?
15. A restaurant has 5 pieces of apple pie, 4 pieces of chocolate cream pie, and 3 pieces of blueberry pie. If Janine selects a piece of pie at random for dessert, what is the probability that she selects either apple or chocolate cream?
16. At a statewide meeting, there are 20 school superintendents, 13 principals, and 6 assistant principals. If one of these people is chosen at random, what is the probability that he or she is either a principal or an assistant principal?
17. An airline has one bank of 13 telephones at a reservations office. Of the 13 operators who work there, 8 take reservations for domestic flights and 5 take reservations for international flights. Seven of the operators taking domestic reservations and 3 of the operators taking international reservations are female. If an operator is chosen at random, what is the probability that the person chosen takes domestic reservations or is a male?

18. **MUSIC** Forty senior citizens were surveyed about their music preferences. The results are displayed in the Venn diagram. If a senior citizen from the survey group is selected at random, what is the probability that he or she likes only country and western music? What is the probability that he or she likes classical and/or country, but not 1940's pop?

