

11-2 Practice

Probability

Form G

1. A basketball player attempted 24 shots and made 13. Find the experimental probability that the player will make the next shot she attempts.
2. A baseball player attempted to steal a base 70 times and was successful 47 times. Find the experimental probability that the player will be successful on his next attempt to steal a base.

Graphing Calculator For Exercises 3–4, define a simulation by telling how you represent correct answers, incorrect answers, and the quiz. Use your simulation to find each experimental probability.

3. If you guess the answers at random, what is the probability of getting at least three correct answers on a four-question true-or-false quiz?
4. A five-question multiple-choice quiz has four choices for each answer. If you guess the answers at random, what is the probability of getting at least four correct answers?

A group of five cards are numbered 1–5. You choose one card at random. Find each theoretical probability.

5. $P(\text{card is a 2})$
6. $P(\text{even number})$
7. $P(\text{prime number})$
8. $P(\text{less than 5})$

A bucket contains 15 blue pens, 35 black pens, and 40 red pens. You pick one pen at random. Find each theoretical probability.

9. $P(\text{black pen})$
10. $P(\text{blue pen or red pen})$
11. $P(\text{not a blue pen})$
12. $P(\text{black pen or not a red pen})$

11-3

Practice

Form G

Probability of Multiple Events

Classify each pair of events as *dependent* or *independent*.

1. A member of the junior class is selected; one of her pets is selected.
2. A member of the junior class is selected as junior class president; a freshman is selected as freshman class president.
3. An odd-numbered problem is assigned for homework; an even-numbered problem is picked for a test.
4. The sum of two rolls of a number cube is 6; the product of the same two rolls is 8.

Q and R are independent events. Find $P(Q \text{ and } R)$.

5. $P(Q) = \frac{1}{8}, P(R) = \frac{2}{5}$	6. $P(Q) = 0.8, P(R) = 0.2$
7. $P(Q) = \frac{1}{4}, P(R) = \frac{1}{5}$	8. $P(Q) = \frac{3}{4}, P(R) = \frac{2}{3}$

9. Suppose you have seven CDs in a box. Four are rock, one is jazz, and two are country. Today you choose one CD without looking, play it, and put it back in the box. Tomorrow, you do the same thing. What is the probability that you choose a country CD both days?

You randomly select an integer from 1 to 100. State whether the events are mutually exclusive. Explain your reasoning.

10. The integer is less than 40; the integer is greater than 50.
11. The integer is odd; the integer is a multiple of 4.
12. The integer is less than 50; the integer is greater than 40.

M and N are mutually exclusive events. Find $P(M \text{ or } N)$.

13. $P(M) = \frac{3}{4}, P(N) = \frac{1}{6}$	14. $P(M) = 10\%, P(N) = 45\%$
15. $P(M) = 20\%, P(N) = 18\%$	16. $P(M) = \frac{1}{10}, P(N) = \frac{3}{5}$

11-3

Practice (continued)

Form G

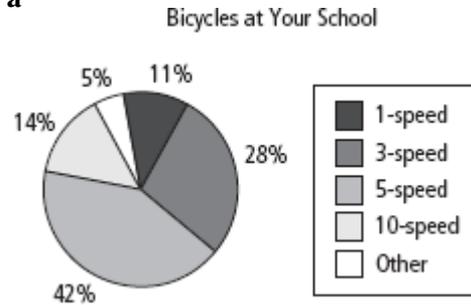
Probability of Multiple Events

17. Exactly 62% of the students in your school are under 17 years old. In addition, 4% of the students are over 18. What is the probability that a student chosen at random is under 17 or over 18?

A fair number cube is tossed. Find each probability.

18. $P(\text{even or } 3)$ 19. $P(\text{less than } 2 \text{ or even})$ 20. $P(\text{prime or } 4)$
21. You randomly choose a natural number from 1 to 10. What is the probability that you choose a multiple of 2 or 3?

The graph at the right shows the types of bicycles in a bicycle rack. Find each probability.



22. A bicycle is a 1-speed.
23. A bicycle is a 3-speed or a 5-speed.
24. A bicycle is not a 10-speed.
25. A bicycle is not a 1-, 3-, or 10-speed.

You have a drawer with five pairs of white socks, three pairs of black socks, and one pair of red socks. You choose one pair of socks at random each morning, starting on Monday. You do not put the socks you choose back in the drawer. Find the probability of each event.

26. You select black socks on Monday and white socks on Tuesday.
27. You select red socks on Monday and black socks on Tuesday.
28. You select white socks on Monday and Tuesday.
29. You select red socks on Monday.
30. Only 93% of the airplane parts being examined pass inspection. What is the probability that all of the next 5 parts examined will pass inspection?

11-4

Practice

Form G

Conditional probability

Use the table at the right to find each probability.

- $P(\text{has less than high school education})$
- $P(\text{earns over } \$30,000 \text{ and has less than high school education})$
- $P(\text{earns over } \$30,000 \mid \text{has only high school education})$
- $P(\text{has high school education or less} \mid \text{earns over } \$30,000)$

Education and Salary of Employees

	Under \$20,000	\$20,000 to \$30,000	Over \$30,000
Less than high school	69	36	2
High school	112	98	14
Some college	102	193	143
College degree	13	178	245

Use the table below to find each probability. The table gives information about students at one school.

Favorite Leisure Activities

	Sports	Hiking	Reading	Phoning	Shopping	Other
Female	39	48	85	62	71	29
Male	67	58	76	54	68	39

- $P(\text{sports} \mid \text{female})$
- $P(\text{reading} \mid \text{male})$
- $P(\text{hiking} \mid \text{female})$
- $P(\text{male} \mid \text{shopping})$
- $P(\text{female} \mid \text{sports})$
- $P(\text{male} \mid \text{reading})$
- $P(\text{hiking} \mid \text{male})$
- $P(\text{female} \mid \text{shopping})$
- The senior class is 55% female, and 32% of the class are females who play a competitive sport. What is the probability that a student plays a competitive sport, given that the student is female?
- A softball game has an 80% chance of being cancelled if it rains and a 30% chance of being cancelled if there is fog when there is no rain. There is a 70% chance of fog with no rain and a 30% chance of rain.
 - Make a tree diagram based on the information above.
 - Find the probability that there will be fog and the game will be cancelled.
 - Find the probability that there will be rain and the game will be played.
 - Find the probability that the game will be cancelled.

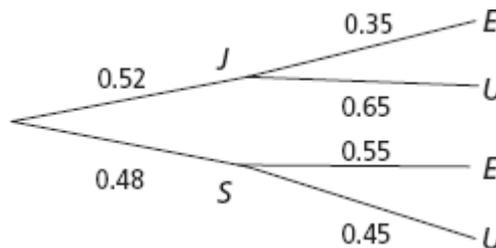
11-4 Practice (continued)

Conditional probability

Form G

15. The population of a high school is 51% male. 45% of the males and 49% of the females attend concerts.
- Make a tree diagram based on the information above.
 - Find the probability that a student is male and attends concerts.
 - Find the probability that a student is female and does not attend concerts.
 - Find the probability that a student attends concerts.
16. **Reasoning** A student says that if $P(A) = P(A | B)$, then A and B must be independent events. Is the student correct? Explain.
17. A school's colors are blue and gold. At a pep rally, 65% of the students are wearing both blue and gold, and 90% of the students are wearing blue.
- What percent of students wearing blue are also wearing gold?
 - Writing** Describe how a tree diagram could help you solve this problem.

You survey a group of juniors and seniors. The tree diagram relates student's class and whether a student is employed after school. Find each probability. Let J, S, E, and U represent junior, senior, employed, and unemployed, respectively.



- $P(E)$
- $P(S | E)$
- $P(S | U)$
- $P(J \text{ and } U)$
- $P(J | U)$
- $P(J | E)$