

pg. 644 #2-12 even, 20, 22

2.  $\frac{54}{90} = .6$

6.  $\frac{547 + 776}{2501} = .529$

10. Have had a pet

Has a pet now

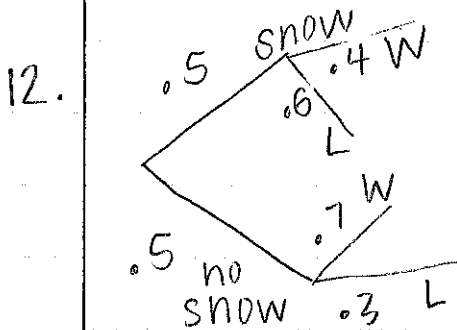
	yes	no	total
yes	39	<sup>14-14</sup> 0	<sup>39+0</sup> 39
no	<sup>61-14</sup> 47	14	61
total	86	<sup>100-86</sup> 14	100

do not have now

all percentages, total must be 100

↑ have had

$\frac{\text{never had}}{\text{doesn't have now}} = \frac{14}{61} = .23$  or 23%



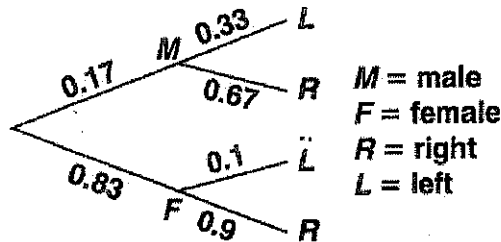
$P(W) = (.5)(.4) + (.5)(.7)$   
 $.2 + .35 = .55$

20. P(S and W)

Answers for Lesson 12-2, pp. 644–646 Exercises

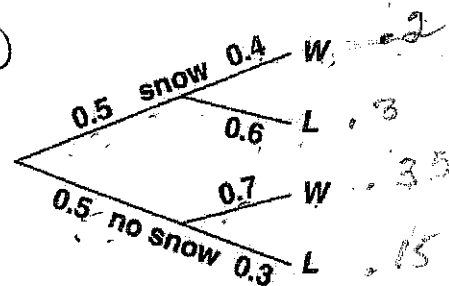
1. 0.9                      2. 0.6                      3.  $0.\bar{6}$   
 4.  $\approx 0.085$               5.  $\approx 0.406$               6.  $\approx 0.529$   
 7.  $\approx 0.568$               8.  $\approx 0.780$               9.  $\approx 45\%$   
 10.  $\approx 23\%$

11.



0.1, 0.114

12.



$P(W) = 0.55$

13. a. 0.15  
 b. 0.60  
 c.  $P(A)$  is equal to  $P(A | B)$   
 d. The fact that  $P(A) = P(A | B)$  illustrates that the probability of  $A$  is the same, regardless of the occurrence of  $B$ .

14–18. Check students' work.

19.  $P(C)$

20.  $P(S \text{ and } W)$               21.  $P(R | W)$               22.  $P(W | S)$

23. a. The four right branches represent probabilities conditional upon the person being an adult or a minor. For example, the top branch represents the probability that a person is licensed given that he or she is an adult.  
 b. No; the probability of a minor being licensed is not the same as the probability of an adult being licensed.  
 c. Check students' work.

24.  $P(I | N) = 0.2$                       25. C

26. H    27. D

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12-2

1.  $54/59 \sim .92$

2.  $54/90 \sim .6$

3.  $54/81 = .6$

5.  $1016/2501 \sim .406$

6.  $1323/2501 \sim .529$

4.  $5/59 \sim .085$

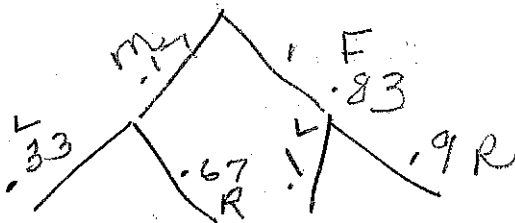
7.  $322/567 \sim .568$

8.  $P(\text{not ass} | \text{male}) = 792/1016 \sim .78$

9.  $P(\text{Pet} | \text{had pet}) = .39/.86 \sim .45$  or 45%

10.  $P(\text{Never} | \text{not now}) = .14/.61 \sim 23\%$

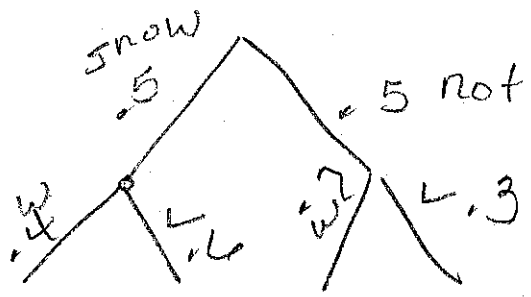
11.



a)  $P(F+L) = .83 \times .1 = .083$   
 $\sim 1\%$

b)  $P(M, R) = .17 \times .67 = .114$

12.



$P(\text{snow} | W) = .5 \times .4 = .2$

$P(\text{Not snow} | W) = .5 \times .7 = .35$

$P(\text{win}) = .2 + .35 = .55$

13. a)  $P(A+B) = P(A) \cdot P(B) = .60 \times .25 = .15$

b)  $P(A|B) = \frac{P(A \text{ and } B)}{P(B)} = \frac{.15}{.25} \sim .6$

c) Equal

12. 2 2-23 even

2)  $P(\text{dip and Exp}) = \frac{54}{90} = .6$

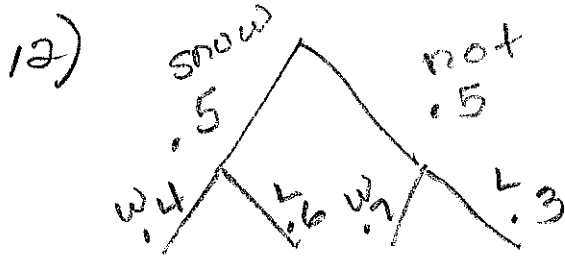
From Sample Space (not event)

4)  $P(\text{no dipl. / exp}) = \frac{5}{59} = \sim .085$

6)  $P(\text{deg is Bach}) = \frac{547+776}{2501} \sim .529$

8)  $P(\text{Not Assoc / male}) = \frac{547+245}{1016} \sim .78$

10)  $P(\text{Never put / none now}) = \frac{14}{61} \sim .229$  or 23%



Win = .5 x .4 = .20  
 .5 x .7 = .35  
 .2 + .35 = .55

14) omit      16) —      18)

20)  $P(S \text{ and } W)$       22)  $P(W | S)$

## Practice 1-6

## Probability

1. You select a number at random from the sample space  $\{1, 2, 3, 4, 5\}$ . Find each theoretical probability.

a.  $P(\text{the number is } 2) = 1/5$

b.  $P(\text{the number is even}) = 2/5$

c.  $P(\text{the number is prime}) = 3/5$

d.  $P(\text{the number is less than } 5) = 4/5$

2. In a class of 19 students, 10 study Spanish, 7 study French, and 2 study both French and Spanish. One student is picked at random. Find each probability.

a.  $P(\text{studying Spanish but not French}) = 8/19$

b.  $P(\text{studying neither Spanish nor French}) = 4/19$

c.  $P(\text{studying both Spanish and French}) = 2/19$

d.  $P(\text{studying French}) = 7/19$

3. In a telephone survey of 150 households, 75 respondents answered "Yes" to a particular question, 50 answered "No," and 25 were "Not sure." Find each experimental probability.

a.  $P(\text{answer was "Yes"}) = 1/2$

b.  $P(\text{answer was "No"}) = 1/3$

c.  $P(\text{answer was "Not sure"}) = 1/6$

d.  $P(\text{answer was not "Not sure"}) = 5/6$

4. A wallet contains four bills with denominations of \$1, \$5, \$10, and \$20. You choose two of the four bills from the wallet at random and add the dollar amounts.

a. What is the sample space? How many outcomes are there?  $6 \text{ outcomes}$

b. What is the probability of getting \$15?  $1/6$

c. What is the probability of getting \$50?  $0$

d. What is the probability of getting at least \$25?  $1/3$

5. A basketball player has attempted 24 shots and made 13. Find the experimental probability that the player will make the next shot that she attempts.

$$\frac{13}{24}$$

6. 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.

$$\frac{47}{70}$$

For Exercises 7-8, define a simulation by telling how you represent correct answers, incorrect answers, and the quiz. Use your simulation to find each experimental probability.

7. If you guess the answers at random, what is the probability of getting at least three correct answers on a four-question true-false quiz?

vary

8. 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?

vary

9. A circular pool of radius 12 ft is enclosed within a rectangular yard measuring 50 ft by 100 ft. If a ball from an adjacent golf course lands at a random point within the yard, what is the probability that the ball lands in the pool?

~.09

10. Five people each flip a coin. What is the theoretical probability that all five will get heads?

 $1/32$

# Practice 9-7

## Probability of Multiple Events

Integers from 1 to 100 are randomly selected. State whether the events are mutually exclusive.

- 1. Even integers and multiples of 3 **no**
- 2. Integers less than 40 and integers greater than 50 **y**
- 3. Odd integers and multiples of 4 **y**
- 4. Integers less than 50 and integers greater than 40 **n**

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

- 5. A member of the junior class and a second member of the same class are randomly selected. **dependent**
- 6. A member of the junior class and a member of another class are randomly chosen. **independent**
- 7. An odd-numbered problem is assigned for homework, and an even-numbered problem is picked for a test. **independent**
- 8. The sum and the product of two rolls of a number cube **dependent**

Find each probability.

- 9. A flavored-water company wants to know how many people prefer its new lemon-flavored water over two competitors' brands. The company hires you to survey 1000 people and ask them to rank the three drinks in order of preference. After conducting the survey, you find that 35% prefer the lemon-flavored water over Competitor A, 38% prefer the lemon-flavored water over Competitor B, and 47% did not prefer the lemon-flavored water over either competitor's brand. What is the probability that someone prefers the lemon-flavored water over both competitors' brands? **20%**
- 10. A natural number from 1 to 10 is randomly chosen.
  - a.  $P(\text{even or } 7)$  **.06**
  - b.  $P(\text{even or odd})$  **1**
  - c.  $P(\text{multiple of 2 or multiple of 3})$  **.7**
  - d.  $P(\text{odd or less than 3})$  **.6**
- 11. A standard number cube is tossed.
  - a.  $P(\text{even or } 3)$  **2/3**
  - b.  $P(\text{less than 2 or even})$  **2/3**
  - c.  $P(\text{prime or } 4)$  **2/5**
  - d.  $P(2 \text{ or greater than } 6)$  **1/6**
- 12. Only 93% of the airplane parts Salome is examining pass inspection. What is the probability that all of the next five parts pass inspection? **69.6%**
- 13. There is a 50% chance of thunderstorms the next three days. What is the probability that there will be thunderstorms each of the next three days? **12.5%**

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

- 14.  $P(Q) = \frac{1}{8}, P(R) = \frac{2}{5}$  **1/20**
- 15.  $P(Q) = 0.8, P(R) = 0.2$  **1/5**
- 16.  $P(Q) = \frac{1}{4}, P(R) = \frac{1}{5}$  **1/20**

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

- 17.  $P(M) = \frac{3}{4}, P(N) = \frac{1}{6}$  **1/12**
- 18.  $P(M) = 10\%, P(N) = 45\%$  **55%**
- 19.  $P(M) = \frac{1}{5}, P(N) = 18\%$  **38%**

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