1. What is the variable under study? Is it a random variable?

2. How many people were in the study?

3. Complete the table.

4. From the information given, what is the probability that a student will drop a class because of illness? Money? Change of major?

5. Would you consider the information in the table to be a probability distribution?

6. Are the categories mutually exclusive?

7. Are the categories independent?

8. Are the categories exhaustive?

9. Are the two requirements for a discrete probability distribution met?

See page 297 for the answers.

Exercises 5–1

1. Define and give three examples of a random variable.

2. Explain the difference between a discrete and a continuous random variable.

3. Give three examples of a discrete random variable.

4. Give three examples of a continuous random variable.

5. What is a probability distribution? Give an example.

For Exercises 6 through 11, determine whether the distribution represents a probability distribution. If it does not, state why.

6.
X	2	5	6	8	10
P(X)	$\frac{2}{11}$	$\frac{1}{11}$	$\frac{3}{11}$	$\frac{3}{11}$	$\frac{1}{11}$

7.
X	3	6	8	12
P(X)	0.3	0.5	0.7	−0.8

8.
X	3	6	8
P(X)	−0.3	0.6	0.7

9.
X	1	2	3	4	5
P(X)	$\frac{3}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$

10.
X	20	30	40	50
P(X)	0.05	0.35	0.4	0.2

11.
X	5	10	15
P(X)	1.2	0.3	0.5

For Exercises 12 through 18, state whether the variable is discrete or continuous.

12. The speed of a jet airplane

13. The number of cheeseburgers a fast-food restaurant serves each day

14. The number of people who play the state lottery each day

15. The weight of a Siberian tiger

16. The time it takes to complete a marathon

17. The number of mathematics majors in your school

18. The blood pressures of all patients admitted to a hospital on a specific day

For Exercises 19 through 26, construct a probability distribution for the data and draw a graph for the distribution.

19. **Medical Tests** The probabilities that a patient will have 0, 1, 2, or 3 medical tests performed on entering a hospital are $\frac{6}{15}$, $\frac{5}{15}$, $\frac{3}{15}$, and $\frac{1}{15}$, respectively.

20. **Student Volunteers** The probabilities that a student volunteer hosts 1, 2, 3, or 4 prospective first-year students are 0.4, 0.3, 0.2, and 0.1, respectively.

21. **Birthday Cake Sales** The probabilities that a bakery has a demand for 2, 3, 5, or 7 birthday cakes on any given day are 0.35, 0.41, 0.15, and 0.09, respectively.

22. **DVD Rentals** The probabilities that a customer will rent 0, 1, 2, 3, or 4 DVDs on a single visit to the rental store are 0.15, 0.25, 0.3, 0.25, and 0.05, respectively.

23. **Loaded Die** A die is loaded in such a way that the probabilities of getting 1, 2, 3, 4, 5, and 6 are $\frac{1}{2}$, $\frac{1}{6}$, $\frac{1}{12}$, $\frac{1}{12}$, $\frac{1}{12}$, and $\frac{1}{12}$, respectively.

24. **Item Selection** The probabilities that a customer selects 1, 2, 3, 4, and 5 items at a convenience store are 0.32, 0.12, 0.23, 0.18, and 0.15, respectively.

25. **Student Classes** The probabilities that a student is registered for 2, 3, 4, or 5 classes are 0.01, 0.34, 0.62, and 0.03, respectively.

26. **Garage Space** The probabilities that a randomly selected home has garage space for 0, 1, 2, or 3 cars are 0.22, 0.33, 0.37, and 0.08, respectively.