

Discrete Random Variables

A Review

Distinguishing Between Discrete and Continuous Random Variables

In Exercises 13–20, decide whether the random variable x is discrete or continuous. Explain your reasoning.

- 13.** x represents the number of motorcycle accidents in one year in California.
- 14.** x represents the length of time it takes to get to work.
- 15.** x represents the volume of blood drawn for a blood test.
- 16.** x represents the number of rainy days in the month of July in Orlando, Florida.
- 17.** x represents the number of home theater systems sold per month at an electronics store.
- 18.** x represents the tension at which a randomly selected guitar's strings have been strung.
- 19.** x represents the amount of snow (in inches) that fell in Nome, Alaska last winter.
- 20.** x represents the total number of die rolls required for an individual to roll a five.

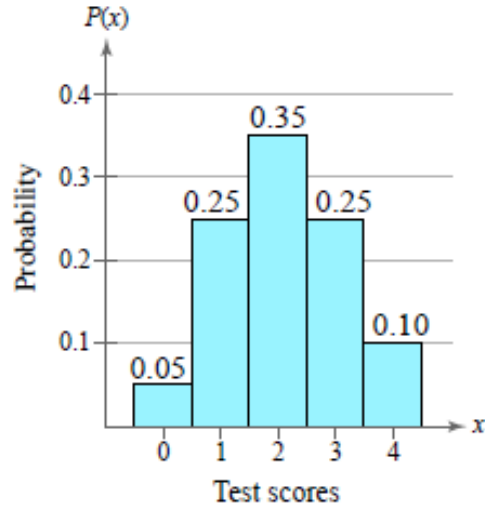


FIGURE FOR EXERCISE 21

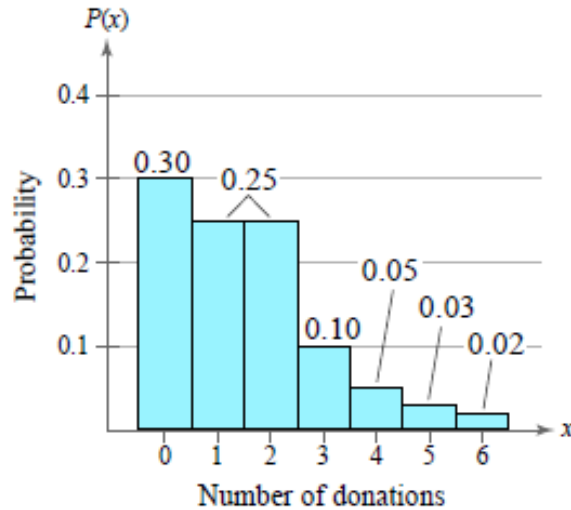


FIGURE FOR EXERCISE 22

■ Using and Interpreting Concepts

- 21. Employee Testing** A company gave psychological tests to prospective employees. The random variable x represents the possible test scores. Use the histogram to find the probability that a person selected at random from the survey's sample had a test score of (a) more than two and (b) less than four.
- 22. Blood Donations** A survey asked a sample of people how many times they donate blood each year. The random variable x represents the number of donations for one year. Use the histogram to find the probability that a person selected at random from the survey's sample donated blood (a) more than once in a year and (b) less than three times in a year.

Identifying Probability Distributions In Exercises 25–28, decide whether the distribution is a probability distribution. If it is not a probability distribution, identify the property (or properties) that are not satisfied.

- 25. Tires** A mechanic checked the tire pressures on each car that he worked on for one week. The random variable x represents the number of tires that were underinflated.

x	0	1	2	3	4
$P(x)$	0.30	0.25	0.25	0.15	0.05

- 26. Phone Lines** A company recorded the number of phone lines in use per hour during one work day. The random variable x represents the number of phone lines in use.

x	0	1	2	3	4	5	6
$P(x)$	0.135	0.186	0.226	0.254	0.103	0.64	0.032

Constructing Probability Distributions In Exercises 29–34, (a) use the frequency distribution to construct a probability distribution, find the (b) mean, (c) variance, and (d) standard deviation of the probability distribution, and (e) interpret the results in the context of the real-life situation.

29. Dogs The number of dogs per household in a small town

Dogs	0	1	2	3	4	5
Households	1491	425	168	48	29	14

30. Cats The number of cats per household in a small town

Cats	0	1	2	3	4	5
Households	1941	349	203	78	57	40

Finding Expected Value In Exercises 35–40, use the probability distribution or histogram to find the (a) mean, (b) variance, (c) standard deviation, and (d) expected value of the probability distribution, and (e) interpret the results.

35. Quiz Students in a class take a quiz with eight questions. The number x of questions answered correctly can be approximated by the following probability distribution.

x	0	1	2	3	4	5	6	7	8
$P(x)$	0.02	0.02	0.06	0.06	0.08	0.22	0.30	0.16	0.08

36. 911 Calls A 911 service center recorded the number of calls received per hour. The number of calls per hour for one week can be approximated by the following probability distribution.

x	0	1	2	3	4	5	6	7
$P(x)$	0.01	0.10	0.26	0.33	0.18	0.06	0.03	0.03