12-4 Additional Practice

Probability Distributions

1. What is the difference between a probability experiment that is a binomial experiment and one that is not a binomial experiment?

2. A light fixture contains 6 light bulbs. With normal use, each bulb has a 0.85 chance of lasting for at least 4 months. What is the theoretical probability that all 6 bulbs will last for 4 months? Round to the nearest whole percent.

3. A marble is chosen at random from a bag containing 8 marbles: 4 blue, 3 green, and 1 red. Define a probability distribution for this experiment on the sample space {B, G, R}.

4. An online game has three possible outcomes: A, B, or C. After playing the game, Leo got A 12 times, B 9 times, and C 4 times. Define an experimental probability distribution based on Leo's results.

Use this information for Items 5–7. There is a 60% probability of rain each of the next 5 days. Find each probability. Round to the nearest whole percent.

5. It will rain on at least 3 of the next 5 days.

6. It will rain on at least 1 of the next 5 days.

7. It will rain on at least 1 of the next 2 days.

12-4 Additional Practice

Probability Distributions

1. What is the difference between a probability experiment that is a binomial experiment and one that is not a binomial experiment?
Sample answer: A binomial experiment has a fixed number of trials, there are two possible outcomes for each trial, the probability of each outcome is the same for every trial, and the results of the trials are independent. If any of these conditions are not met, it is not a binomial experiment.

2. A light fixture contains 6 light bulbs. With normal use, each bulb has a 0.85 chance of lasting for at least 4 months. What is the theoretical probability that all 6 bulbs will last for 4 months? Round to the nearest whole percent.
38%

3. A marble is chosen at random from a bag containing 8 marbles: 4 blue, 3 green, and 1 red. Define a probability distribution for this experiment on the sample space {B, G, R}.
Sample answer: Let P be the function defined on the set {B, G, R} such that $P(B) = 0.5$, $P(G) = 0.375$, and $P(R) = 0.125$.

4. An online game has three possible outcomes: A, B, or C. After playing the game, Leo got A 12 times, B 9 times, and C 4 times. Define an experimental probability distribution based on Leo's results.
Sample answer: Let P be the function defined on the set {A, B, C} such that $P(A) = 0.48$, $P(B) = 0.36$, and $P(C) = 0.16$.

Use this information for Items 5–7. There is a 60% probability of rain each of the next 5 days. Find each probability. Round to the nearest whole percent.

5. It will rain on at least 3 of the next 5 days.
68%

6. It will rain on at least 1 of the next 5 days.
99%

7. It will rain on at least 1 of the next 2 days.
84%