Sec.1.7: #8. An elevator in a building starts with 5 passengers and stops at 7 floors. If every passenger is equally likely to get off at each floor and all the passengers leave independently of each other, what is the probability that no two passengers will get off at the same floor?

Sec.1.8: #2. Which of the following two numbers is larger: \( \binom{93}{30} \) or \( \binom{93}{31} \)?

Sec.1.9: #4. If the letters \(s, s, s, t, t, t, i, a, c\), are arranged in a random order, what is the probability that they will spell the word “statistics”?

Sec.1.10: #6. A box contains 30 red balls, 30 white balls, and 30 blue balls. If 10 balls are selected at random, without replacement, what is the probability that at least one color will be missing from the selection?

Sec.1.12: #4. Suppose that in a deck of 20 cards, each card has one of the numbers 1, 2, 3, 4, or 5 and there are four cards with each number. If 10 cards are chosen from the deck at random, without replacement, what is the probability that each of the numbers 1, 2, 3, 4, and 5 will appear exactly twice?

Sec.2.1: #4. Each time a shopper purchases a tube of toothpaste, he chooses either brand A or brand B. Suppose that for each purchase after the first, the probability is 1/3 that he will choose the same brand that he chose on his preceding purchase, and the probability is 2/3 that he will switch brands. If he is equally likely to choose either brand A or brand B on his first purchase, what is the probability that both his first and second purchases will be brand A and both his third and fourth purchases will be brand B?

Sec.2.2: #6. Suppose that 10,000 tickets are sold in one lottery and 5000 are sold in another lottery. If a person owns 100 tickets in each lottery, what is the probability that she will win at least one first prize?

Sec.2.2: #12. Suppose that \( A, B, \) and \( C \) are three independent events such that

\[ P(A) = 1/4, \quad P(B) = 1/3, \quad \text{and} \quad P(C) = 1/2. \]

(a) Determine the probability that none of these three events will occur. (b) Determine the probability that exactly one of these three events will occur.