Probability Homework #4

(Coverage: 3.4, 3.5)

1. A stack of cards consists of six red and five blue cards. A second stack of cards consists of nine red cards. A stack is selected at random and three of its cards are drawn. If all of them are red, what is the probability that the first stack was selected?

2. An urn contains five red and three blue chips. Suppose that four of these chips are selected at random and transferred to a second urn, which was originally empty. If a random chip from this second urn is blue, what is the probability that two red and two blue chips were transferred from the first urn to the second urn?

3. A fair die is rolled twice. Let A denote the event that the sum of the outcomes is odd, and B denote the event that it lands 2 on the first toss. Are A and B independent? Why or why not?

4. Three missiles are fired at a target and hit it independently, with probabilities 0.7, 0.8, and 0.9, respectively. What is the probability that the target is hit?

5. An event occurs at least once in four independent trials with probability 0.5904. What is the probability of its occurrence in one trial?

6. A fair die is rolled six times. If on the ith roll, $1 \leq i \leq 6$, the outcome is i, we say that a *match* has occurred. What is the probability that at least one match occurs?

7. An experiment consists of first tossing a fair coin and then drawing a card randomly from an ordinary deck of 52 cards with replacement. If we perform this experiment successively, what is the probability of obtaining heads on the coin before an ace from the cards?