Problems:

1. Section 5.5, exercise 10 [5th edition: Section 4.5, exercise 10]

2. How many ways are there to select 7 cards from a standard deck of 52 playing cards so that there are at least 5 cards of the same suit?

3. Section 5.4, exercise 6 [5th edition: Section 4.4, exercise 6]

4. Section 5.4, exercise 8 [5th edition: Section 4.4, exercise 8]

5. Section 5.4, exercise 28(a) [5th edition: Section 4.4, exercise 28(a)]

6. A deck of 10 cards, each bearing a distinct number from 1 to 10, is shuffled to mix the cards thoroughly, so that each order is equally likely. What is the probability that the top three cards are in increasing order?

7. A fair coin is flipped n times. What is the probability that all the heads occur at the end of the sequence?

8. You are given a 5-card hand from a randomly shuffled deck of 52 cards. Given that you have at least one ace, what's the probability that you have another ace?

9. **Optional**: The 120 seats on a Northeast Airlines flight were completely booked, with each of the 120 passengers having different assigned seats. The passengers entered the plane one-by-one. Unfortunately, the first passenger couldn't read their boarding pass and sat in a (uniformly) random seat. Each subsequent passenger sat in their assigned seat if it was available when they entered and sat in a (uniformly) random empty seat otherwise. What is the probability that the last passenger sat in their assigned seat?