

Problems:

1. Section 5.5, 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
4. Section 5.4, exercise 8
5. Section 5.4, 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?

Please write about how many hours it took you to complete this assignment near where you write your name on the first page.