

Homework 2

Math 262

due 5:00pm on Friday, February 18

Write your solutions to the following problems clearly and neatly. Make sure to explain your reasoning and provide mathematical details that support your answers. For a few tips on writing solutions, see [this helpful guide for mathematical writing](#).

You may write or type your solutions electronically, or write them on paper and scan or photograph them. Upload a single file containing your solutions to the [Homework 2](#) assignment on Moodle.

Book Problems

- Section 1.2 #17, 24 (pages 18–20)
- Section 1.3 #31, 32, 33, 34 (pages 31–33)

Additional Problems

1. There are n socks (3 of which are red) in a drawer. What is the value of n such that when 2 of the socks are chosen, the probability that both are red is $\frac{1}{2}$? What assumptions are being made?
2. A poker hand consists of 5 cards dealt from a standard 52-card deck.* If it is assumed that all poker hands are equally likely, what is the probability of being dealt:
 - (a) A flush? (A hand is said to be a flush if all 5 cards are of the same suit.)
 - (b) One pair? (This occurs when the cards have ranks a, a, b, c, d , where a, b, c , and d are all distinct.)
 - (c) Two pairs? (This occurs when the cards have ranks a, a, b, b, c , where a, b , and c are all distinct.)
 - (d) Three of a kind? (This occurs when the cards have ranks a, a, a, b, c , where a, b , and c are all distinct.)
 - (e) Four of a kind? (This occurs when the cards have ranks a, a, a, a, b , where a and b are distinct.)

*A standard 52-card deck consists of 13 cards of each of the four *suits*: clubs (\clubsuit), diamonds (\diamond), hearts (\heartsuit), and spades (\spadesuit). Within each suit, each of the 13 cards has a different *rank*: ace, king, queen, jack, 10, 9, \dots , 2.