Stat 200A Homework 2

Note, the "Problems" and "Theoretical Exercises" are listed in separate sections at the end of the chapter.

The problem numbers are based on the **9th edition**. (A copy of these problems is available on the course webpage under the folder 'book problems'.)

1. Chapter 2, Problem 52
2. Chapter 2, Theoretical Exercise 11
3. Chapter 2, Theoretical Exercise 20
4. Chapter 3, Problem 15
5. Chapter 3, Problem 46 (Hint: The function $f(x) = x^2$ is convex. (Look this up if you don't know what convex means.)
6. Chapter 3, Theoretical Exercise 6,
7. This problem introduces a simple meteorological model, more complicated versions of which have been proposed in the meteorological literature. Consider a sequence of days and let R_i denote the event that it rains on day i. Suppose that $P(R_i|R_{i-1}) = \alpha$ and $P(R_i^c|R_{i-1}^c) = \beta$. Suppose further that only today's weather is relevant to predicting tomorrow's; that is, $P(R_i|R_{i-1} \cap R_{i-2} \cap ... \cap R_0) = P(R_i|R_{i-1})$.
   (a) If the probability of rain today is p, what is the probability of rain tomorrow?
   (b) What is the probability of rain the day after tomorrow?
   (c) What is the probability of rain n days from now? What happens as $n \to \infty$?

Reading Assignment. Please read Chapters 2 and 3 of the text.