Homework 7

Math 262

due 5:00pm on Friday, March 13

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 PDF file containing your solutions to the Homework 7 assignment on Moodle.

Book Problems

- Section 2.5 #77, 81, 85, 87, 88 (pages 111–114)

  Note: In #87(c), the radius is 0.1 mile.

- Section 2.6 #91, 93, 98, 103 (pages 120–123)

Additional Problem

A forest is home to a population of N raccoons. Twelve of these raccoons were captured, marked, and released. After a week, 20 raccoons were captured; of these, X had been marked in the first capture. Assume that each capture is a random sample of the population, and that the same N raccoons were in the forest for both capture operations.

(a) If $N = 50$, what is the probability that no more than 5 of the raccoons in the second capture were marked from the first capture?

(b) Suppose that 9 raccoons in the second capture were marked from the first capture. What is the most likely value of N? That is, what is the value of N that would result in the largest probability that exactly 9 marked raccoons would appear in the second capture?