

# Homework 7

Math 262

due 5:00pm on Friday, September 25

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 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?