Homework 16

Math 262

due 5:00pm on Wednesday, December 6

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 16 assignment on Moodle.

Book Problems

- Section 4.4 #69, 77 (page 287)

- Section 4.5 #91, 95, 99 (pages 300–302)

Additional Problems

1. Suppose that X is the random variable denoting the number of bacteria per cubic centimeter in water samples and that for a given location, X has a Poisson distribution with mean λ. But λ varies from location to location and has a gamma distribution with parameters α and β. Find expressions for $E(X)$ and $V(X)$ in terms of α and β.

2. Explain in your own words the difference between the Central Limit Theorem and the Law of Large Numbers.

Extra Credit Problem

Two 2-digit numbers and are formed by randomly selecting digits, without replacement, from the digits $1, 2, \ldots, 9$. What is the expected value of the product of the two numbers?