

Homework 16

Math 262

due 5:00pm on Monday, May 9

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