

This assignment is due at the beginning of class on Monday, November 2, 2009.

1. Chapter 4 Problem #1, page 113. Since the random vector $(X, Y, Z)'$ is continuous and the density $f(x, y, z)$ is symmetric in x , y , and z , we can immediately conclude that $P(X < Y < Z) = 1/6$. (Compare this to Problem 6 on Assignment #1.) However, I would like to you write down an iterated integral to represent

$$P(X < Y < Z) = \iiint_{\{x < y < z\}} f(x, y, z) \, dx \, dy \, dz.$$

(There are $3! = 6$ different integrals that you can choose depending on your order of dx , dy , and dz .) Then compute this integral and verify that you do, in fact, get $1/6$.

2. Chapter 4 Problem, pages 113–114, #6 through #11. Problems involving order statistics of uniform random variables are suitable for exams!

3. Chapter 4 Problems, pages 113–116, #3, #5, #15, #16, #17, #19, #20, #21, #22, #24, #27

4. Chapter 4 Problem #27, page 116. The distribution of $V = \max\{X_1, \dots, X_N\}$ is interpreted to be a conditional distribution in the following sense. Suppose that $N = n$ is fixed. Determine the distribution of $\max\{X_1, \dots, X_n\}$ which is really the conditional distribution $V|N = n$. You can now find the distribution of V using the law of total probability. (Don't forget to handle the case $N = 0$ separately.) Also, you will find it easier to calculate $E(V)$ by first calculating $E(V|N = n)$.