

HOMEWORK 8 (4653, FALL 2008)

Solve: Problems 11.4, 11.10, 11.20, and the following problems:

I. (10 points) Let $f(x, y) = c(y^2 - x^2)$ for all $0 \leq x \leq y \leq 1$ and $f(x, y) = 0$ otherwise. Compute constant c and the correlation coefficient.

II. (10 points) Two points a, b are chosen uniformly and independently from the unit disc $x^2 + y^2 \leq 1$. Compute the probability that $\angle aOb$ is obtuse, where $O = (0, 0)$ is the center of the disc.

III. (10 points) Suppose X has $\text{Exp}(1)$ distribution and $Y = X^2$. Compute the correlation coefficient $\rho(X, Y)$.

This Homework is due Tuesday December 9 at 4:40 pm. (right before the class). You **MUST** box all the answers. Remember that the answers are not enough, you also need to provide all intermediate calculations exhibiting your logic. However, no written explanations are necessary unless the problem asks for them.