Stat 351 Fall 2006
Assignment #1

This assignment is due at the beginning of class on Monday, September 11, 2006. You must submit all problems that are marked with an asterix (*).

1. * Send me an email to say "Hello." If I have never taught you before, tell me a bit about your background in math and statistics. (I ask for everyone to send me an email so that I can create a mailing list for this class.)

2. * Suppose that X and Y are independent random variables. Suppose further that $X \sim \text{Exp}(2)$ and $Y \sim \text{Unif}[0, 4]$.

(a) Determine $F_{X,Y}(x, y)$, the joint distribution function for (X, Y).

(b) Show directly (by computing the indicated partial derivative) that

$$\frac{\partial^2}{\partial x \partial y} F_{X,Y}(x, y) = f_X(x) f_Y(y).$$

Is this surprising? Why or why not?

(c) If $Z \sim \mathcal{N}(0, 1)$ is independent of X and Y, determine the joint density of (X, Y, Z).

3. * On the top of page 10, Gut writes: "The joint distribution function can be expressed in terms of the joint probability function and the joint density function, respectively, in the obvious way." Write down these two (obvious) expressions for the joint distribution function.