

ECONOMICS 6331 – Probability and Statistics, Fall 2006

Homework 5. Wednesday October 11. Due Monday October 16.

1. Assume you roll a two dice. Let X be the number of times you observe 1, 2, or 3 eyes and let Y be the number of times you observe a 3. Derive
 - a) the joint probability distribution $f(x, y)$ (as in example 5.1).
 - b) $f_X(x)$, the marginal probability function for X .
 - c) $f_Y(y)$, the marginal probability function for Y .
 - d) $P(X < Y)$.
 - e) $P(Y = 2X)$.
 - f) $P(X + Y = 2)$.
 - g) Are X and Y independent or dependent?

2. Let $f(x, y) = (3/16)xy^2$; $0 < x < 2$, $0 < y < 2$, be the joint density function for X and Y . Find the marginal density functions $F_X(x)$ and $F_Y(y)$. Are the two random variables independent?

3. Let $f(x, y) = 1/6 e^{-x/2-y/3}$ be the joint density function for X and Y . Find the marginal density functions $F_X(x)$ and $F_Y(y)$. Are the two random variables independent?