HW #6A

Section 5.1 in textbook

1. Suppose that the following table represents the joint probability distribution of the discrete random variable (X,Y). Evaluate all the marginal and conditional distributions. Are X and Y independent?

Y \ X	1	2	3
1	$\frac{1}{12}$	$\frac{1}{6}$	0
2	0	$\frac{1}{9}$	$\frac{1}{5}$
3	$\frac{1}{18}$	$\frac{1}{4}$	$\frac{2}{15}$

2. For $f(x,y) = k(3x+9y)$; $0 \le x \le 1$, $0 \le y \le 1$

   a) find k

   b) find the joint probability that $0 \le X \le \frac{1}{2}$ and $\frac{1}{2} \le Y \le 1$

   c) find the marginal distributions for X and Y

   d) Are X and Y independent?

3. Pick X at random between 0 and 2. Independently, pick Y at random between 0 and 3. Find the probability that $X + Y < 1$.

(4.) If X and Y are random variables with joint pdf:

$$f(x,y) = \begin{cases} 6e^{-2x-3y} & \text{for } x_1, x_2 > 0 \\ 0 & \text{elsewhere} \end{cases}$$

What is: a) $P(X < 2 \text{ and } Y > 2)$?

b) the marginal density for X?

c) the marginal density for Y?

d) Are X and Y independent?