STAT/MA 41600
Practice Problems: October 24, 2014

1. Consider a pair of random variables X, Y with constant joint density on the triangle with vertices at $(0, 0)$, $(3, 0)$, and $(0, 3)$.

Find the expected value $\mathbb{E}(X)$. (Notice that, by symmetry, $\mathbb{E}(Y)$ is just the same!)

2. Consider a pair of random variables X, Y with constant joint density on the quadrilateral with vertices $(0, 0)$, $(2, 0)$, $(2, 6)$, $(0, 12)$.

a. Find the expected value $\mathbb{E}(X)$.

b. Find the expected value $\mathbb{E}(Y)$.

3. Let X, Y have joint density $f_{X,Y}(x,y) = 14e^{-2x-7y}$ for $x > 0$ and $y > 0$; and $f_{X,Y}(x,y) = 0$ otherwise.

a. Find the expected value $\mathbb{E}(X)$.

b. Find the expected value $\mathbb{E}(Y)$.

4. Let X, Y have joint density $f_{X,Y}(x,y) = 18e^{-2x-7y}$ for $0 < y < x$; and $f_{X,Y}(x,y) = 0$ otherwise.

a. Find the expected value $\mathbb{E}(X)$.

b. Find the expected value $\mathbb{E}(Y)$.

5. Suppose X, Y has joint density

$$f_{X,Y}(x,y) = \begin{cases} \frac{1}{9}(3-x)(2-y) & \text{if } 0 \le x \le 3 \text{ and } 0 \le y \le 2, \\ 0 & \text{otherwise.} \end{cases}$$

a. Find the expected value $\mathbb{E}(X)$.

b. Find the expected value $\mathbb{E}(Y)$.