

STAT/MA 41600
Practice Problems: October 17, 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 $P(X + Y > 2)$.

2. Consider a pair of random variables X, Y with constant joint density on the quadrilateral with vertices $(0, 0)$, $(2, 0)$, $(2, 6)$, $(0, 12)$. Find $P(Y \geq 3X)$.

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. Find $P(X > Y)$.

4. Suppose X, Y has joint density

$$f_{X,Y}(x, y) = \begin{cases} 1/16 & \text{if } -2 \leq x \leq 2 \text{ and } -2 \leq y \leq 2, \\ 0 & \text{otherwise.} \end{cases}$$

Find $P(|X - Y| \leq 1)$.

5. Suppose X, Y has joint density

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

Find $P(Y > X)$.