STAT/MA 41600
In-Class Problem Set #25: October 14, 2016

1. Suppose that X and Y have joint probability density function $f_{X,Y}(x,y) = 15e^{-5x-3y}$ for $x > 0$ and $y > 0$, and $f_{X,Y}(x,y) = 0$ otherwise. Find $P(Y > X/2)$.

2a. For the joint pdf in **1**, find $P(\max(X,Y) \leq 1)$.
2b. For the joint pdf in **1**, find $P(1 \leq \min(X,Y))$.

3. Suppose that X and Y have joint density $f_{X,Y}(x,y) = 24e^{-5x-3y}$ for $y > x > 0$, and $f_{X,Y}(x,y) = 0$ otherwise. What is the density of X?

4. Suppose that X and Y have joint probability density function

$$f_{X,Y}(x,y) = \begin{cases} \frac{1}{64}(4-x)(4-y) & \text{if } 0 < x < 4 \text{ and } 0 < y < 4 \\ 0 & \text{otherwise} \end{cases}$$

Calculate $P(X + Y \leq 4)$.