STAT/MA 41600
In-Class Problem Set #28: October 20, 2017

1. Suppose that the probability density function for X is $f_X(x) = x/9$ for $0 \leq x \leq 3$, and $f_X(x) = 2/3 - x/9$ for $3 \leq x \leq 6$, and $f_X(x) = 0$ otherwise. Find $\mathbb{E}(X)$.

2. Suppose that X and Y have joint probability density function $f_{X,Y}(x, y) = (3/4)(x - y)$ for $0 < y < x < 2$, and $f_{X,Y}(x, y) = 0$ otherwise.
2a. What is the expected value of X?
2b. What is the expected value of Y?

3. Suppose that X and Y have joint probability density function $f_{X,Y}(x, y) = 69e^{-3x-8y}$ for $0 < 5y < x$, and $f_{X,Y}(x, y) = 0$ otherwise. What is $\mathbb{E}(Y)$?

4. Consider a pair of random variables X and Y whose joint probability density function is constant on the triangle with vertices at the points $(-4, 0)$, $(0, 2)$, and $(8, 0)$.
4a. What is the expected value of X?
4b. What is the expected value of Y?