

Math 477, Homework 7

Name: _____

Net ID: _____

1. Two dice are rolled. Let X be the random variable representing the result of the first die, and Y be the random variable representing the largest value rolled on either die. Describe the joint probability density function for X and Y .

2. Let X and Y be continuous random variables with joint probability density function $f(x, y) = \frac{12}{7}(x^2 + xy)$ for $x, y \in [0, 1]$ and 0 otherwise.
 - (a) Find $P(X < 1/2)$.

 - (b) Find $P(X < Y)$.

 - (c) Find $P(X + Y < 1)$.

3. Let X, Y, Z be uniformly distributed random variables on the interval $[0, 2]$. Calculate the probability that they are ordered as $X < Y < Z$. That is, calculate $P(X < Y < Z)$.

4. Suppose that X is exponentially distributed with density function $f(x) = \lambda e^{-\lambda x}$ and Y is uniformly distributed on the interval $[0, L]$. Find the probability density function for the random variable $X + Y$.