Homework Set 11

DUE: MAY 11, 2020 (VIA BLACKBOARD BY 11:00AM)

To be handed in:

Please write your solution to Problems 1, 2, 3 on a single sheet of paper!

1. Let X be a uniform random variable on the interval $(0, 1)$.
   a) Find a formula for the moment generating function $M_X(t)$ of X.
   b) Compute the first 3 moments of X by differentiating $M_X(t)$.
   c) Use the first 2 moments to recover the variance of X.

2. Let Y be a Poisson random variable with parameter $\lambda = 5$.
   a) Find a formula for the moment generating function $M_Y(t)$ of Y.
   b) Compute the first 3 moments of Y by differentiating $M_Y(t)$.
   c) Use the first 2 moments to recover the variance of X.

3. Assume that the random variables X and Y in the above problems are independent. What is the moment generating function $M_{X+Y}(t)$ of their sum?