

Homework 7

Do the problems on webwork and turn the following problems in class on Mar. 29th.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

Problem 1. Let X be a random variable with pdf

$$f_X(x) = \begin{cases} 2x, & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$$

Compute the moment generating function of X . Use the moment generating function to compute the mean of X .

Problem 2. Let $p > 0$ be a real number. Consider function f ,

$$f(t) = \begin{cases} Ct^{-p}, & \text{for } t \geq \frac{1}{2} \\ 0, & \text{otherwise.} \end{cases}$$

- (a) For which values of p is there a constant C so that this function f is a probability density function for some continuous random variable? What is the corresponding C ?
- (b) For which values of p will this random variable have finite expectation?
- (c) For which values of p will this random variable have finite variance?