

SM 316 – Spring 2019

Homework 4

Due: Monday 11 FEB 2019

PLEASE READ THE INSTRUCTIONS/SUGGESTIONS ON THE COURSE WEBPAGE.

Hand in the following problems:

1. From the text book, 4.2, 4.12, 4.20, 4.34.
2. Suppose that X is a random variable with mean 2 and variance 3.
 - (a) Compute $E(X - 1)^2$.
 - (b) Compute $\text{Var}(2X + 1)$.

3. Consider these two random variables X and Y ,

$$P(X = 0) = \frac{1}{2}, \quad P(X = 1) = P(X = -1) = \frac{1}{4},$$

and

$$P(Y = 0) = \frac{1}{2}, \quad P(Y = 10) = P(Y = -10) = \frac{1}{4}.$$

Find $E[X]$ and $E[Y]$. Next find the variance of X and variance of Y . Discuss why the mean of X and Y don't tell the whole story about the random variables.

4. The length of time, in minutes, for an airplane to obtain clearance for takeoff at a certain airport is a random variable $Y = 3X - 2$, where X has the density function

$$f(x) = \begin{cases} \frac{1}{4}e^{-x/4}, & x > 0 \\ 0, & \text{elsewhere.} \end{cases}$$

Find the mean and variance of the random variable Y .