IME625: Stochastic Processes

2021-22 Sem-II

Homework-3

A stick of length 1 meter is broken into three pieces in a random manner, i.e., all possibilities are equally likely. With respect to one end, let X denote the first break-point and Y denote the second (so that $X < Y$). Determine joint distribution and density functions of (X, Y). Obtain marginal distribution and density functions of X and Y. Calculate conditional density function of $X|Y$ and verify that $E_Y\big[E[X|Y]\big] = E[X]$. Find $Cov(X, Y)$.

Hint: In a plane plot the values that (X, Y) can take. These values are equally likely.