

MA 587/687

Name (Print last name first):

Double Quiz 5

Question 1

If X is exponential with mean $1/\lambda$, show that $Y = \lfloor X \rfloor + 1$ is geometric. What is the parameter of the geometric random variable Y ?

Question 2

Aaron, Betty, and Charles enter a store with two clerks, and Aaron and Betty go directly to the clerks. What is the probability that Aaron is the last one to leave if the two clerks have independent exponential service times with mean $1/\lambda$?

Question 3

A doctor has an appointment at 1pm and 2pm. The appointments are independent exponentials with mean 30 minutes. If both patients are on time, what is the expected amount of time the second patient spends at the doctor's office?

Question 4

Consider an arbitrary point P_1 in a 2-dimensional Poisson process with parameter λ . Let $D = |P_1 - P_2|$ denote the Euclidean distance from this point to the next nearest point P_2 . Calculate

(a) $P(D > t)$

(b) Let X denote the difference between the x -coordinates of P_1 and P_2 and let Y denote the difference of y -coordinates. Calculate $P(|X| + |Y| > t)$