CEE 110

Discussion Week 8

Ex 22. Suppose that calls are received at a 24-hour "suicide hotline" according to a Poisson process with rate $\alpha = .5$ call per day. Then the number of days T between successive calls has an exponential distribution with parameter value 0.5

a. What is the probability that more than 2 days elapse between calls?

b. What is the expected time between successive calls?

Ex. Suppose the survival time X in weeks of a randomly selected mouse exposed to 240 rads of gamma radiation has a gamma distribution with $\alpha = 8$, $\beta = 15$. What is the probability that a mouse survives at least 30 weeks?

7. The joint probability distribution of the number *X* of cars and the number *Y* of buses per signal cycle at a proposed left-turn lane is displayed in the accompanying joint probability table.

p(*x*, *y*)		*y* = 0	*y* = 1	*y* = 2
x	0	.025	.015	.010
	1	.050	.030	.020
	2	.125	.075	.050
	3	.150	.090	.060
	4	.100	.060	.040
	5	.050	.030	.020

a. What is the probability that there is exactly one car and exactly one bus during a cycle?

b. What is the probability that there is at most one car and at most one bus during a cycle?

c. What is the probability that there is exactly one car during a cycle? Exactly one bus?

d. Suppose the left-turn lane is to have a capacity of five cars, and that one bus is equivalent to three cars. What is the probability of an overflow during a cycle?

e. Are X and Y independent rv's? Explain.