

HW #5

Please, write clearly and justify all your steps, to get proper credit for your work.

(1)[3 Pts] On average, 2.5 telephone calls per minute are received at the UH's switchboard. Assuming that the number of incoming calls per minute follows a Poisson distribution, compute the probability that at any given minute there will be more than 2 calls.

(2)[3 Pts] Suppose that in one year the number of industrial accidents X follows a Poisson distribution with mean 3.0. If each accident leads to an insurance claim of \$5,000, how much money would an insurance company need to keep in reserve to be 95 % certain that the claims are covered?

(3)[4 Pts] A delivery company found that the number of complaints was six per years on average. Assuming that the number of complaints follows a Poisson distribution, calculate the probability of having no complaints in

(a) all of next year;

(b) the next quarter.

(4)[6 Pts] Let X and Y have the following joint p.d.f. Compute μ_X , μ_Y , σ_X , σ_Y and ρ in each case:

(a)

	x	
y	1	2
1	0.5	0
2	0	0.5

(b)

	x	
y	1	2
1	0.25	0.25
2	0.25	0.25

(c)

	x	
y	1	2
1	0.1	0.4
2	0.4	0.1

(5)[6 Pts] Let X and Y have the following joint p.d.f.

	x		
y	1	2	3
1	0.05	0.15	0.15
2	0.10	0.10	0.10
3	0.15	0.15	0.05

- (a) Calculate the marginal densities. Are X and Y are independent?
- (b) Compute the means and variances.
- (c) Are X and Y positively correlated? negatively correlated? uncorrelated?