

Quiz #5

Please, show your work and write legibly. Recall the following R commands:

`dpois(x, lambda)`:  $P(X = x)$  for  $X \sim \text{Poisson}(\lambda)$

`ppois(q, lambda)`:  $P(X \leq q)$  for  $X \sim \text{Poisson}(\lambda)$

(1)[4 Pts] A delivery company found that the number of complaints was 12 per years on average. Assuming that the number of complaints follows a Poisson distribution, calculate the probability of having

- (a) at most 8 complaints in all of next year;
- (b) 8 complaints or more in all of next year.

(2) [6 Pts] Let  $X$  and  $Y$  have the following joint p.d.f.

<b>y</b>	<b>x</b>		
	1	2	3
1	0.10	0.15	0.15
2	0.05	0.10	0.10
3	0.10	0.20	0.05

- (a) Calculate the means with respect to  $X$  and  $Y$
- (b) Are  $X$  and  $Y$  dependent or independent? Justify our answer.
- (c) Are  $x$  and  $Y$  positively correlated? negatively correlated? uncorrelated? Justify your answer?