Group Work - Chapter 5

1 A small town does a census of pet ownership. They find the following distribution of number of dog per household (the data file "dogs.csv" on D2L)...

Number of dogs	Probability
0	0.394
1	0.342
2	0.16
3	0.067
4	0.036
5	0.001

(a) Is this a probability distribution? What is the expected number of dogs per household? What is the standard deviation? What is the variance?

(b) What is the probability of a household having at most one dog? Is this unusual? What is the probability of having four or more dogs? Is this unusual?

2 The best player on the Metro State basketball team successfully makes 85% of her free throws. During a typical game she attempts 15 free throws. (If she attempts a different number of free throws, it is not a typical game.)

(a) Is the number of free throws she makes in a typical game a proper binomial random variable? What are the values of n, p and q?

(b) What is the expected number of free throws made per game? What is the standard deviation?

(c) What is the probability she makes all her free throws in a typical game? Is that unusual? What is the probability she makes at least 12 free throws? Less than 12?

(d) What are unusual numbers of free throws made per game?

3 Our taco restaurant, which is open 12 hours a day, get an average of 720 customers a day. For staffing purposes, they are interested in understanding how many customers they might get between 1 and 2 PM. They want to use a Poisson random variable of customers per hour.

(a) What is the rate of customers per hour (λ)? If $X \sim Pois(\lambda)$ is the random variable to be used, what is the expected value of X? What is the standard deviation?

(b) What is the probability that the restaurant will get 70 or more customers in an hour? What is the probability they will get less than 55?

(c) What are unusually high or low numbers of customers per hour?

(d) What is wrong with using this method to predict customers during the hour between 1 and 2 pm?