STAT 319, TERM 073
Home Work Problems for Chapters 3 and 4

Problem 1. A sales rep for a national clothing company makes 4 calls per day. Based on historical records, the following probability distribution describes the number of successful calls each day:

Successful Calls	Probability
0	0.10
1	0.30
2	0.30
3	0.20
4	0.10

a) What is the probability that the sales rep will have two successful calls in a two-day period?
b) Each successful call earns the sales rep $100. Based on the information provided, what is the expected earnings for a sales rep who makes calls for 10 days?

Problem 2. The following probability distribution has been assessed for the number of accidents that occur in a mid-western city each day:

Accidents	Probability
0	0.25
1	0.20
2	0.30
3	0.15
4	0.10

a) Based on this distribution, what the expected number of accidents in a given day?
b) Based on this probability distribution, what the standard deviation in the number of accidents per day?

Problem 3. A random variable Y, which represent the weight (in ounces) of a product, has probability density function given by

$$f(y) = \begin{cases} y - 8 & for\ 8 \le y \le 9 \\ 10 - y & for\ 9 < y \le 10 \\ 0 & otherwise \end{cases}$$

a) Calculate the mean of the random variable Y.
b) The manufacturer sells the product for a fixed price of $2.00. He guarantees to refund the purchase money to any customer who finds the weight of the product to be less than 8.25 ounces. His cost of production is related to the weight of the product by the relation is y/15 + 0.35. Find the expected profit per product.

Problem 4. A college professor always finishes his lectures within 2 minutes after the bell rings to end the period and the end of the lecture. Let X = the time that elapses between the bell and the end of the lecture and suppose the pdf of X is

$$f(x) = \begin{cases} kx^2 & 0 \le x \le 2 \\ 0 & \text{otherwise} \end{cases}$$

Find the value of k.

b. What is the probability that the lecture ends within 1 minute of the bell ringing?
c. What is the probability that the lecture continues beyond the bell for between 60 and 90 seconds?
d. What is the probability that the lecture continues for at least 90 seconds beyond the bell?