1 Probability

1. The random variable X has the following probability distribution where a and b area some constants:

X	1	2	3	4	5
$P(X)$	0.2	a	a	0.2	b

   If the mean $E(X) = 3$, then find values of a and b and hence determine $P(X \geq 3)$.

2. A departmental store sends bills to charge its customers once a month bill in time. The store also found that 70% of its customers pay their first month bill in time has the probability of 0.8 of paying in time next month and the customer who doesn't pay in time has the probability of 0.4 of paying in time the next month.
   Based on the above information, answer the following questions:

   (i) Let E_1 and E_2 respectively denote the event of customer paying or not paying the first month bill in time.
   Find $P(E_1)$, $P(E_2)$.

   (ii) Let A denotes the event of customer paying second month's bill in time, then find $P(A|E_1)$ and $P(A|E)$.

   (iii) Find the probability of customer paying second month's bill in time.

   (iv) Find the probability of customer paying first month's bill in time if it is found that customer has paid the second month's bill in time.