Assignment 1

1. A man owns a house in town and a cottage in the country. In any one year the probability of the town house being burgled is 0.01 and the probability of the country cottage being burgled is 0.05. In any one year what is the probability that: (a) both will be burgled? (b) one or the other (but not both) will be burgled ?

2. Suppose that for three dice of the standard type all 216 outcomes of a throw are equally likely. Denote the scores obtained by X1, X2 and X3. By counting outcomes in the events find (a) $P(X1+X2+X3 <5)$ (b) $P(X1 + X2 < (X3)^2)$.

3. I have in my pocket ten coins. Nine of them are ordinary coins with equal chances of coming up head and tail when tossed and the tenth has two heads.
   (a) If I take one of the coins at random from my pocket, what is the probability that it is the coin with two heads?
   (b) If I toss the coin and it comes up heads, what is the probability that it is the coin with two heads?
   (c) If I toss the coin one further time and it comes up tails, what is the probability that it is one of the nine ordinary coins? (Explain with reason)

4. Let the random variable X has the following distribution $f(x)=(5- 2x)/12$ for $-1<=x<=2$ and 0 elsewhere. Find the median and lower quartile.

5. Let X be a continuous random variable with PDF $f(x)=x^2(2x+(3/2))$ for $0<x\leq1$ and 0 otherwise. If $Y=(2/X)+3$, find Var(Y).