Question 4

a) Prob[a packet sent by A is successfully received by B] $= (1 - q)^N$; denote this probability by $p_{success}$.

b) Assuming that only host A performs retransmissions then X is a geometric random variable with success probability $= p_{success}$. Thus, $E[X] = \frac{1}{p_{success}}$ (and $Var[X] = \frac{1 - p_{success}}{p_{success}^2}$).