Review Questions 1

Q1. You flip a coin repeatedly until getting at least a Head and a Tail. What is the expected number of required flips?

Q2. One of the 6 keys which looks similar open a lock. If you choose the keys one by one without replacement what would be the expected number of trials to open the lock?

Q3. We take 10 samples of X with the pdf $f(x) = \frac{1}{x^2}$, $x > 1$. How many of them are expected to be greater than 2?

Q4. If $f(x) = 1 - |x|$, $-1 < x < 1$, find $Var(X)$.

Q5. If $f(x) = 4x^3$, $0 < x < 1$, find pdf for $Y = 2lnx^4$.

Q6. Random variable X is the maximum results of tossing a die twice. Find $P(X < 4)$.

Q7. If the regression lines for X and Y are given by $y = x + 1$ and $x = \frac{1}{2}y - 1$, find $Corr(X, Y)$.

Q8. If $X_i s$are iid with $Var(X) = 1$ and $Corr(X_i, X_j) = \frac{1}{4}$, find $Var(\sum_i^n X_i)$.

Q9. If $f(x) = \theta x^{\theta-1}, 0 < x < 1,$ and $Y = -ln X$, find Mean and Variance of Y.

Q10. In a Poisson RV, $P(X = 4) = \frac{1}{3} P(X = 2)$. Find $P(X \geq 2)$.