Tutorial 02a

01)

Let $X \sim Binomial(n, p)$. Using Markov's inequality, find an upper bound on $P(X \geq \alpha n)$, where $p < \alpha < 1$. Evaluate the bound for $p = \frac{1}{2}$ and $\alpha = \frac{3}{4}$.

02)

Let $X \sim Binomial(n, p)$. Using Chebyshev's inequality, find an upper bound on $P(X \geq \alpha n)$, where $p < \alpha < 1$. Evaluate the bound for $p = \frac{1}{2}$ and $\alpha = \frac{3}{4}$.

03)

Marks $\boldsymbol{Y}$ of an examination has $\boldsymbol{E(Y) = 58}$ and $\boldsymbol{Var(Y) = 16}$. Give a lower bound for the probability that a mark of a student is between $\mathbf{40}$ and $\mathbf{76}$.