Answer on Question #41868, Math, Statistics and Probability

If X is a Poisson variable and p(X = 3) > p(X = 2) then find the minimum value of mean.

Solution

$$p(X = 3) = e^{-\lambda}\frac{\lambda^3}{3!}, \quad p(X = 2) = e^{-\lambda}\frac{\lambda^2}{2!}.$$

$$p(X = 3) > p(X = 2) \rightarrow e^{-\lambda}\frac{\lambda^3}{3!} > e^{-\lambda}\frac{\lambda^2}{2!} \rightarrow \frac{\lambda^3}{3!} > \frac{\lambda^2}{2!} \rightarrow \lambda > 3.$$

The mean

$$E(X) = \lambda > 3.$$

Thus, the minimum value of mean is 3.

Answer: 3.