Question #68505, Math / Statistics and Probability

The number of gamma rays emitted per second by a certain radioactive substance is a random variable having Poisson distribution with $\lambda = 5.8$. If a recording instrument becomes inoperative when there are more than 12 rays per second, what is the probability that this instrument becomes inoperative during any given second.

Answer.

$$\mathbf{P(X > 12) = 1 - P(X \leq 11) = 1 - e^{-\lambda} \sum_{n=0}^{11} \frac{\lambda^n}{n!} = 1 - e^{-5.8} \sum_{n=0}^{11} \frac{5.8^n}{n!} = 0.0068.}$$