EXAM P QUESTIONS OF THE WEEK

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Week of October 8/07

The Winnipeg Rangers hockey team is considering a one-time charitable program of making a donation to the Winnipeg Children's Hospital. The donation will be related to how many goals they score in their next game. The team statistician has determined that the number of goals scored by the Rangers in a game has a Poisson distribution with a mean of 3.
The Rangers are planning donate $K for each goal they score up to a maximum of 3 goals.
Find the value of K that would make the Rangers' expected donations for game to be $5000..

The solution can be found below.

Week of October 8/07 - Solution

The donation is $\begin{cases} 0 & \text{Prob. } e^{-3} \\ K & \text{Prob. } 3e^{-3} \\ 2K & \text{Prob. } \frac{9e^{-3}}{2} \\ 3K & \text{Prob. } 1-(e^{-3}+3e^{-3}+\frac{9e^{-3}}{2}) \end{cases}$

The expected donation is

$K \cdot 3e^{-3} + 2K \cdot \frac{9e^{-3}}{2} + 3K \cdot [\, 1-(e^{-3}+3e^{-3}+\frac{9e^{-3}}{2})] = 2.328K$.

Setting this equal to 5000 results in $K = 2148$.