

Quiz 2

Question 1

Suppose you buy tickets in 20,000 different lotteries with each tickets having a $\frac{1}{10000}$ chance of winning. What is the approximate probability that you will win strictly less than 2 prizes? (You do NOT need to show your work for this question)

Question 2

If X is a nonnegative integer-valued random variable, show that

$$E(X) = \sum_{k \geq 1} P(X \geq k).$$

Question 3

Suppose X and Y are independent Poissons with pmf's $e^{-\lambda_1} \frac{\lambda_1^k}{k!}$ and $e^{-\lambda_2} \frac{\lambda_2^k}{k!}$, respectively. Use a discrete convolution to find the pmf of the random variable $X + Y$.