Problem 7: Sum of a random number of r.v.'s

(4/4 points)

A fair coin is flipped independently until the first Heads is observed. Let K be the number of Tails observed **before** the first Heads (note that K is a random variable). For $k = 0, 1, 2, \ldots, K$, let X_k be a continuous random variable that is uniform over the interval $[0, 3]$. The X_k's are independent of one another and of the coin flips. Let the random variable X be defined as the sum of all the X_k's generated before the first Heads. That is, $X = \sum_{k=0}^{K} X_k$. Find the mean and variance of X. You may use the fact that the mean and variance of a geometric random variable with parameter p are $1/p$ and $(1-p)/p^2$, respectively.

$\mathbf{E}[X] =$ 3 ✔

$\mathbf{var}(X) =$ 6 ✔

You have used 2 of 2 submissions

DISCUSSION

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