

Innocent Monkey

Question: A very innocent monkey throws a fair die. The monkey will eat as many bananas as are shown on the die, from 1 to 5. But if the die shows 6, the monkey will eat 5 bananas and throw the die again. This may continue indefinitely. What is the expected number of bananas the monkey will eat?

Solution: Let X be number of bananas. Then $E(X) = (1 + 2 + 3 + 4 + 5)/6 + (5 + E(X))/6$. Thus, $E(X) = 4$.