

ECONOMICS 6331 – Probability and Statistics, Fall 2006

Homework 4. Wednesday September 27. Due Monday October 2.

1. Ramanathan, Exercise 3.15, page 59. Find the Moment Generation Function and use that to find the mean and variance.
2. If X is a Binomially distributed random variable with $p = 0.6$ and $n = 2$, what is the mean and variance of X ? Find the answer two ways: a) directly summing over the outcomes; and b) using the moment generation function.
3. Ramanathan, Practice Problem 3.9, page 48.
4. Assume that X is uniformly distributed on the interval $[-5, 10]$. Let $h(x)$ be the function x^2 . Find $P\{h(X) \geq b\}$ and $Eh(X)$ and verify that $Eh(X) \geq bP\{h(X) \geq b\}$ for $b = 1$ and $b = 16$.
5. Show that if X is uniformly distributed on the interval $[0, 1]$ then $Y = -\theta \log(X)$ follows an exponential distribution with mean θ . Explain why Jensen's inequality implies that $E(Y) > \log(2)$ for $\theta = 1$.