

AEB 6533–Statistics in Food and Resource Economics
First Test–October 6, 1999

1. Assume $f(x)=1/10$ and $y=\ln(x)$, find $g(y)$, $E[y]$, and $V[y]$.
2. Is $f(x)=3x^2$ a valid distribution function? Find the moment generating function for this distribution. Given the sample below, do the first three sample moments agree with what you expect?

Observation	x
1	0.9154
2	0.0720
3	0.6965
4	0.9528
5	0.6044
6	0.7113
7	0.6163
8	0.4971
9	0.3148
10	0.5633
11	0.0317
12	0.4200
13	0.6522
14	0.9747
15	0.7210
16	0.1208
17	0.3644
18	0.4458
19	0.6637
20	0.7892

3. Given (X,Y) such that $V(X)=V(Y)=1$, $E[X]=1$, $E[Y]=2$, and $\text{Cov}(X,Y)=1$, what is the estimated value of Y given $X=0$ using the minimum variance estimator?
4. What is the expected value and variance of a gamble of five coin tosses (assume that probability of a head is .5) where each head pays \$1? What is the probability that there will be less than three heads?
5. Demonstrate that X and Y are not independent if $f(x,y)=4x-4xy$ for $0<x<1$ and $0<y<1$.