MATH4/68181: Extreme values and financial risk
Semester 1
Problem sheet 9

Suppose stock returns of a company follow an exponential distribution with random parameter λ. Determine the actual distribution of stock returns if λ follows the

1. exponential distribution with parameter a, a is an unknown parameter,

2. uniform $[a, b]$ distribution, both a and b are unknown parameters,

3. power function distribution with pdf $a\lambda^{a-1}$, $0 < \lambda < 1$, a is an unknown parameter,

4. Pareto distribution with pdf aK^a/λ^{a+1}, $\lambda > K$, both a and K are unknown parameters.

In each case, estimate the unknown parameters by the method of maximum likelihood.