MathFinance 346/Stat 391. Winter 2005.

Homework for Lecture 7. Due Wed 3/2.

1. **The Neyman-Pearson Lemma.**

You want to find the set $\tilde{A}$ which provides a maximum of $P(A)$ subject to $Q^*(A) \leq \alpha$. State the result, and prove it. You can assume that P and Q^* are equivalent.

2. **Quantile hedging the down-and-in option.**

We assume the geometric Brownian motion model (3.1) in the paper, and set

$$H = (X_T - K)^+ I(\min_{0 \leq t \leq T} X_t \leq B)$$

Find the value $\tilde{V}_0$ that minimizes the starting value for a self financing strategy which covers H with probability $1 - \epsilon$. For $\epsilon = 5\%$, $B = 98$, and other values given on p. 261 of the paper, find the numerical value for V_0/H_0.