MathFinance 346/Stat 391. Winter 2005.

Homework 2. Due Wed January 19.

We assume in both problems that under the true probability distribution P, the stock price S is given by

$$dS_t = \mu S_t dt + \sigma S_t dW_t. \tag{1}$$

Also suppose that the short rate r is constant under P.

1. **The Asian call option (continued).** In Problem 1 from last week's HW, find the trading strategy to replicate the option payoff. As before, do not try to calculate the function A.

2. **The double knock-out option (continued).**

(a) As in Problem 2 from last week's HW, let $C(S_0, T)$ be the value of the double knock-out option at time t=0, with stock price S_0. Give the price of the knock-out option at time t, in terms of the function C. Recall that there is no closed functional form of C (except as an infinite sum).

(b) Represent $C(S_0, T) = S_0 f(K/S_0, X_1/S_0, X_2/S_0, T)$, where f only dependes on r and σ. Find the hedging strategy for the double knock-out option in terms of f.