Math 194, Winter 2008

Homework 1 — Due Friday, January 11

1. A forward contract is an agreement to buy or sell an asset at a certain future time for a certain price (called the *forward price*). At the time a forward contract is entered into, no money changes hands. The investor who agrees to *buy* the asset at the future time is said to hold the *long position* in the contract and the investor who agrees to *sell* the asset is said to hold the *short position* in the contract. Suppose that a stock is currently selling for $20 per share. A (long position in a) forward contract is available to buy 100 shares of the stock 3 months from now for $20.20 per share. Suppose that a bank is offering interest at the rate of 5% per annum (compounded continuously) on a 3-month deposit. Describe a strategy for creating an arbitrage profit and compute the amount of the profit.

2. On January 8, 2008, a European call option on Apple (AAPL) has a price of $30. The option expires on January 18 (the third Friday of January), and the strike price is $150. The price of Apple stock on January 8 is $170 per share.

Analyze this situation in the manner of the Exercise on page 3 of the text, considering two possible scenarios: (1) The price of Apple on January 18 is $200; (2) The price of Apple on January 18 is $140. In each case compute the profit (or loss) incurred as a percentage of the investment if one were to invest $3000 in (a) the call option on 100 shares of Apple, or (b) Apple stock.