

Math 194, Winter 2020

Homework 1 — Due Tuesday, January 14

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 by two parties, 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 \$30 per share. A (long position in a) forward contract is available to buy 100 shares of the stock 3 months from now for \$30.25 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 February 4, 2020, a European call option on Apple (AAPL) has a price of \$30. The option expires on February 21 (the third Friday of February), and the strike price is \$300. The price of Apple stock on February 4 is \$320 per share.

Analyze this situation in the manner of the Example on page 3 of the text, considering two possible scenarios: (1) The price of Apple on February 21 is \$360; (2) The price of Apple on February 21 is \$280. 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.