

1) A stock is expected to pay a dividend of \$1 per share in two months and in five months. The stock price is \$50, and the risk-free rate of interest is 8% per annum with continuous compounding for all maturities. An investor has just taken a short position in a six-month forward contract on the stock.

a) What are the forward price and the initial value of the forward contract?

b) Three months later, the price of the stock is \$48 and the risk-free rate of interest is still 8% per annum. What are the forward price?

2) A bank offers a corporate client a choice between borrowing cash at 11% per annum and borrowing gold at 2% per annum. (If gold is borrowed, interest must be repaid in gold. Thus, 100 ounces borrowed today would require 102 ounces to be repaid in one year.) The risk-free interest rate is 9.25% per annum, and storage costs are 0.5% per annum. Discuss whether the rate of interest on the gold loan is too high or too low in relation to the rate of interest on the cash loan. The interest rates on the two loans are expressed with annual compounding. The risk-free interest rate and storage costs are expressed with continuous compounding.

3) A trader owns a commodity that provides no income and has no storage costs as part of a long-term investment portfolio. The trader can buy the commodity for \$1250 per ounce and sell it for \$1249 per ounce. The trader can borrow funds at 6% per year and invest funds at 5.5% per year. (Both interest rates are expressed with annual compounding.) For what range of one-year forward prices does the trader have no arbitrage opportunities? Assume the bid and offer for a forward price are the same.