

MATH 680 502 / 279 501, Winter 2000

PROBLEM SET 2

Due Thursday, February 17

1. Assume that a non-dividend-paying stock has drift μ and volatility σ . An innovative financial institution has just announced that it will trade a security that pays off a dollar amount equal to $\ln S_T$ at time T where S_T denotes the value of the stock price at time T .
 - a) Use risk-neutral valuation to calculate the price of the security at time t in terms of the stock price S and time t
 - b) Check that your price satisfies the Black-Scholes differential equation.
2. Calculate the value of an eight-month European put option on a currency with a strike price of 0.50. The current exchange rate is 0.52, the volatility of the exchange rate is 12%, the domestic risk-free interest rate is 4% per annum, and the foreign risk-free interest rate is 8% per annum.
3. Calculate the value of a five-month European put futures option when the futures price is \$19, the strike price is \$20, the risk-free interest rate is 12% per annum, and the volatility of the futures price is 20% per annum.

Problems from the book: 15 page 89; 1 page 104.