Financial Mathematics
Testing
the Black-Scholes formula
0062-1. Suppose that, on a certain stock, the annual drift is 0.02 and the annual volatility is 0.35. Suppose that the current share price of the stock is $1.

Assume that $1 invested risk-free for one year grows to $e^{0.015}$ dollars.

a. Using the B-S Option Pricing Formula, price a 0.25-year call option on the stock with a strike price of $1.

b. Calibrate the uptick and downtick factors, $e^u$ and $e^d$, of a 50-50 CRR model in which each subperiod is $1/12$ of a year.

c. Using a 3-subperiod 50-50 CRR model, price a 0.25-year call option on the stock with a strike price of $1.$