DSA 5303
Summer 2018

Homework 5

Please show all relevant work when you upload the assignment.

Problem 3.
A stock price is currently 50. Its expected return and volatility are 12% and 30%, respectively. What is the probability that the stock price will be greater than 80 in two years? (Hint $S_T > 80$ when $\ln S_T > \ln 80$.)

Problem 4.
Consider a variable, S, that follows the process

$$dS = \mu\, dt + \sigma\, dz$$

For the first three years, $\mu = 2$ and $\sigma = 3$; for the next three years, $\mu = 3$ and $\sigma = 4$. If the initial value of the variable is 5, what is the probability distribution of the value of the variable at the end of year six?

Problem 5.
A stock price follows geometric Brownian motion with an expected return of 16% and a volatility of 35%. The current price is $38.
   a) *What is the probability that a European call option on the stock with an exercise price of $40 and a maturity date in six months will be exercised?*
   b) *What is the probability that a European put option on the stock with the same exercise price and maturity will be exercised?*