# Fin. Math. Assignment 3

Due on July. 25. 2024

1. Prices for a stock are modeled with a 1- period binomial tree with u = 1.1, d = 0.8, and a period of 3 months.

A European put option on the stock expires in 3 months. You are given:

* 1. The stock’s initial price is 100.
  2. The stock pays no dividends.
  3. The strike price for the put option is 90.
  4. The price of the put option is 6.20.

Determine the continuously compounded risk-free interest rate.

1. Future prices of a stock are modeled with a 1-period binomial tree. You are given:
   1. The stock’s current price is 100.
   2. The continuously compounded risk-free interest rate is 5%.
   3. The stock pays no dividends. (iv) u= 1.2, d= 0.8.

For a European put option, the strike price is 100 and the price is 6.24. Determine the time to expiry for this option.

1. Stock prices for a non-dividend paying stock are modeled with the following 1-period binomial tree, with the period being 6 months:



175

The price of a European call option expiring in 6 months with strike price 120 is



95

1.00. The continuously compounded risk-free interest rate is 5%. Determine the price of the stock.

1. The price of a non-dividend paying stock is modeled by the following 1- period binomial tree, with each period being one year:

80



60

50

A European call option expiring in one year has strike price 60. The continuously compounded risk-free interest rate is 5%.

Determine the amount of money borrowed in the replicating portfolio for the put option.

1. A stock price is currently 200. Over each of the next two six-month periods it is expected to go up by 10% or down by 10%. The interest rate is 5% per annum with continuous compounding. What is the value of a one-year European put option with a strike price of 200? Verify that the European call and European put prices satisfy the put-call parity formula.
2. For a 1-year European call option on a non-dividend paying stock, a 1- period binomial tree is constructed. You are given:
   1. The stock price is 90.
   2. The tree has 𝑢 = 1.2, 𝑑 = 0.8.
   3. The continuously compounded risk-free interest rate is 5%.
   4. A replicating portfolio has 0.5 shares of stock. Determine the strike price of the option.