Homework on Binomial Trees

1. A stock index currently stands at 300. It is expected to increase or decrease by 10% over each of the next two time periods of three months. The risk free interest rate is 8% and dividend yield on the index is 3%. What is the value of a six month put option on the index with a strike price of 300 if it is (a) European and (b) American
2. A futures price is currently 60. It is known that over each of the next two three month periods it will either rise by 10% or fall by 10%. The risk free interest rate is 8% per annum. What is the value of a six month European call option on the futures with a strike price of 60? If the call were American would it ever be worth exercising it early?
3. A stock price is currently $80. It is known that at the end of four months it will be either $75 or $88. The risk free rate is 6 percent per annum with continuous compounding. What is the value of a four–month European put option with a strike price of $80? Use no-arbitrage arguments. What is the delta of this option and what does delta represent in this setting?
4. A futures price is currently 25, its volatility is 30% per annum, and the risk free interest rate is 10% per annum. What is the value of a nine month European call on the futures with a strike price of 26?