1. Suppose that a tree can be planted for a cost of $140. It’s value if cut at time $t$ is $-200 + 40t$. The land cannot be reused after harvest. The continuous rate of interest is 6%. Assuming that the tree is planted, when should the tree be cut? Should the tree be planted at all? What is the value in time-$t$ dollars of the uncut partially-grown tree at time $t$? Explain everything and illustrate in a diagram.

2. The formula for put-call parity is $S + P = Xe^{-r(T-t)} + C$. Define puts and calls and show that at expiration the put-call parity relation holds by definition. (Hint: for the second part, it helps to write the values of puts and calls in terms of max( , ) functions.)
3. Suppose that at time $T$ a stock will have a value either of 54 or 48 with equal probability. The safe discount rate is zero. The current price of the stock is 50. What is the value of a call on the stock with exercise price 50? What is the value of a put with the same exercise price? Put call parity is not satisfied. Construct the riskless arbitrage that allows a trader to profit from the situation. (Use only a moderate amount of space.)