68. A stock price is currently \$40. It is known that at the end of 1 month it will be either \$42 or \$38. What is the value of a 1-month European call option with a strike price of \$39 ($r = 0.08$)?
69. A stock price is currently \$50. It is known that at the end of 6 months it will be either \$45 or \$55. What is the value of a 6-month European put option with a strike price of \$50 ($r = 0.1$)?
70. A stock price is currently \$100. Over each of the next two 6-month periods it is expected to go up or down by 10%. The risk-free interest rate is 8%.
    (a) What is the value of a 1-year European call option with a strike price of \$100?
    (b) What is the value of a 1-year European put option with a strike price of \$100?
    (c) Verify that the European call and put prices from satisfy put-call parity.
71. A stock price is currently \$25. It is known that at the end of 2 months it will be either \$23 or \$27. Suppose S_T is the stock price at the end of 2 months. What is the value of a derivative that pays off S_T^2 at this time ($r = 0.1$)?
72. A stock price is currently \$50. It is known that at the end of 6 months it will be either \$60 or \$42. Calculate the value of a 6-month European call option on the stock with an exercise price of \$48 ($r = 0.12$). Verify that no-arbitrage arguments and risk-neutral valuation arguments give the same answers.
73. A stock price is currently \$30. During each 2-month period for the next 4 months it will increase by 8% or reduce by 10%. The risk-free interest rate is 5%. Use a two-step tree to calculate the value of a derivative that pays off $((30 - S_T)^+)^2$, where S_T is the stock price in 4 months. If the derivative is American style, should it be exercised early?