62. 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.
63. 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 put option with a strike price of \$39 ($r = 0.08$)?
64. A stock price is currently \$40. It is known that at the end of 6 months it will be either \$44 or \$36. What is the value of a 6-month European call option with a strike price of \$40 ($r = 0.1$)?
65. 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 ($r = 0.1$)?
66. 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 7%.
    (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.
67. 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?
68. Consider an option on a non-dividend-paying stock where the stock price is \$40, the strike price is \$40, the risk-free rate is 4% per annum, the volatility is 30% per annum, and the time to maturity is 6 months. Use a two-step tree to value the option if it is a (a) European call; (b) European put; (c) American call; (d) American put.
69. Using a two-step tree, value an American put option on a futures contract, where the strike price and the futures price are \$50, the risk-free rate is 10%, the time to maturity is 6 months, and the volatility is 40% per annum.
70. The AUD is currently worth 0.61 USD, and this exchange rate has a volatility of 10% per annum. The domestic interest rate is 5% per annum and the foreign interest rate is 8% per annum. Value a 3-month American call with strike price of 0.6 using a three-step tree.