

# Financial Mathematics

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<sup>1</sup>Based on Robert L. McDonald's *Derivatives Markets*, 3rd Ed, Pearson, 2013.

# Chapter 10. Binomial Option Pricing: Basic Concepts

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§ 10.1 A one-period Binomial tree

§ 10.2 Constructing a Binomial tree

§ 10.3 Two or more binomial periods

§ 10.4 Put options

§ 10.5 American options

§ 10.6 Options on other assets

§ 10.7 Problems

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At each node we use the following formula to compute the price:

$$P(S, K, t) = \max \left( K - S, e^{-rh} [P(uS, K, t + h)p^* + P(dS, K, t + h)(1 - p^*)] \right)$$

$$p^* = \frac{e^{(r-\delta)h} - d}{u - d}$$

FIGURE 10.7

Binomial tree for pricing an American put option; assumes  $S = \$41.00$ ,  $K = \$40.00$ ,  $\sigma = 0.30$ ,  $r = 0.08$ ,  $T = 1.00$  years,  $\delta = 0.00$ , and  $h = 0.333$ . At each node the stock price, option price,  $\Delta$ , and  $B$  are given. Option prices in ***bold italic*** signify that exercise is optimal at that node.

