University of Texas at Austin

Quiz #21

Binomial option pricing.

Provide your **complete solution** to the following problems. Final answers only, without appropriate justification, will receive zero points even if correct.

Problem 21.1. (15 points) The current price of a continuous-dividend-paying stock is \$50 per share. Its dividend yield is 0.01 and its volatility is 0.2.

The continuously compounded, risk-free interest rate is 0.04.

An analyist models the movement of the stock price over the following quarter-year using a one-period binomial tree. He constructs the tree so that the risk-neutral probability equals 1/2 and so that the ratio of the higher possible time−1 stock price to the lower possible time−1 stock price equals $e^{2\sigma\sqrt{h}}$ where σ stands for the stock's volatility and h stands for the length of the period.

What is the price of a three-month, at-the money put option on the above stock you obtain using the analyst's binomial tree?