

Homework 2

Financial Engineering

Craig Pirrong

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Consider a 3 month call on a stock with a price of \$100. The option has a strike price of \$100, and a volatility of .25. The interest rate is .05.

1. Use 10 point Gauss-Legendre quadrature to estimate the value of a put on this call. The strike price of the “top put” is \$4.36. The put expires in 1 month. In this estimate, integrate over a range of shocks from -4 standard deviations to +4 standard deviations. That is, do not attempt to estimate the critical shock value such that the top option is just at the money.
2. Repeat the exercise in 1. but now use Newton-Raphson to find the critical shock value such that the put is just at the money. Then use GL quadrature to integrate the payoff over the range in which said payoff is positive.