

Homework 7

Consider a binomial model $S(0) = 100$ and $r = .01$ and two possible return values $m_1 = .05$ and $m_2 = -.03$.

1. Find the (time 0) value of a European call with expiry time at step 5 and strike price $X = 105$.
2. Find the (time 0) value of a European put with expiry time at step 5 and strike price $X = 105$.
3. Find the (time 0) value of an Asian call option with expiry at step 3 with strike $X = 105$ and payoff
 $(\frac{1}{3}[S(1) + S(2) + S(3)] - X)^+$

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4. Consider a binomial model $S(0) = 200$ and $r = .0002$ and two possible return values $m_u = .002$ and $m_d = -.001$. Find the value of a European call with expiry time at step 100 and strike price $X = 204$. *Use the Gaussian approximation of the binomial distribution to approximate the sum.*
 5. Setup a binomial stock price model over 1,000 time steps over one year with effective interest 3% and log return having risk neutral variance $\sigma = 9$ at the end of one year. Find the price of a European Put with $S_0 = 200$, strike $X = 206$ and expiry 1 year. *Use the Gaussian approximation of the binomial distribution to approximate the sum.*