

Table 3: Rating system

★★★★★	Essential—appears repeatedly on every exam
★★★★	Important—appears on every exam
★★★	Average importance—regularly appears on exams
★★	Not so important—appears occasionally on exams, or easy to derive as needed
★	Obscure—on syllabus, but unlikely to appear on exam. Sometimes this indicates a formula not covered by all the reading options. No released exam uses this formula or concept, and students have never reported a question from an unreleased exam requiring this formula or concept.



*General put-call parity equation (time 0 to
time T) for European options*



$$C(K, T) - P(K, T) = e^{-rT}(F_{0,T} - K)$$



*$T - t$ prepaid forward price at time t of
nondividend-paying stock*

Put-Call Parity



$$F_{t,T}^P(S) = S_t$$



*$T - t$ prepaid forward price at time t of stock
with discrete dividends*

Put-Call Parity



$$F_{t,T}^P(S) = S_t - PV_{t,T}(\textit{Dividends})$$



*$T - t$ prepaid forward price at time t of stock
with continuous dividends at rate δ*

Put-Call Parity



$$F_{t,T}^P(S) = S_t e^{-\delta(T-t)}$$



*$T - t$ prepaid forward price at time t of
currency, if domestic continuously
compounded risk-free interest rate is r_d and
foreign continuously compounded risk-free
interest rate is r_f*

Put-Call Parity



$$F_{t,T}^P(x) = x_t e^{-r_f(T-t)}$$



*Definition of Q_H, Q_L, U_H, U_L in context of
utility*



- U_H and U_L are utilities—the value of \$1 paid at the end of a year in the high state and low state.
- Q_H and Q_L are the prices of securities that pay \$1 at the end of a year in the high state and in the low state



*Relationship between Q_H and U_H , and
between Q_L and U_L , in utility context*



$$Q_H = pU_H$$

$$Q_L = (1 - p)U_L$$



General form of Black-Scholes formula



$$C(S, K, \sigma, r, t, \delta) = F^P(S)N(d_1) - F^P(K)N(d_2)$$

where

$$d_1 = \frac{\ln\left(F^P(S) / F^P(K)\right) + \frac{1}{2}\sigma^2 t}{\sigma \sqrt{t}}$$

$$d_2 = d_1 - \sigma \sqrt{t}$$



Direct formula for d_2 (without calculating d_1)

Black-Scholes Formula



$$d_2 = \frac{\ln\left(F^P(S) / F^P(K)\right) - \frac{1}{2}\sigma^2 t}{\sigma \sqrt{t}}$$



Black-Scholes formula for European call options on stock with continuous dividends



$$C(S, K, \sigma, r, t, \delta) = S e^{-\delta t} N(d_1) - K e^{-r t} N(d_2)$$

where

$$d_1 = \frac{\ln(S/K) + \left(r - \delta + \frac{1}{2}\sigma^2\right)t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$