**BLACK SCHOLES CALL PRICE**

Current Stock Price, S = $40

Option striking price, K = $45

Time until option exercise, t = 4 months = 4/12 = 1/3 = 0.333 years

Risk-free interest rate, r = 3%/year = 0.03

Standard deviation, s = 40%/year = 0.4

Black-Scholes Call Price, C = SN(d1) – Ke(-rt) N(d2)

d1 = (ln(S/K) + (r + s2/2) t) / (s √t)

d2 = d1 – s √t

d1 = (ln(40 / 45) + (0.03 + (0.42) / 2) \* 0.333) / 0.4 \* √0.333

= (-0.1178) + (0.03 + (0.16/2)) \* 0.333 / 0.4 \* 0.5771

= (-0.1178) + (0.03 + 0.08) \* 0.333 / 0.2308

= (-0.1178) + (0.11) \* 0.333 / 0.2308

= (-0.1178) + 0.0366 / 0.2308

= -0.0812 / 0.2308

= -0.3518

d2 = -0.3518 – 0.4 √0.333

= -0.3518 – 0.2308

= -0.5826

C = 40 \* N(-0.3518) – 45 \* e (-0.03 \* 0.333) \* N(-0.5826)

= 40 \* 0.3625 – 45 \* 0.9901 \* 0.2801

= 14.5 – 12.48

= 2.02