C = StN(d1) – Ke- rtN(d2)

Where:

d1 = [ln( St/K) + (µ + (σs2/2))t]/ (σs√t)

d2 = d1 - σs√t

C = Call option price

S = Current stock, S = $40

K = Strike price, K = $45

µ = Risk-free interest rate, µ = 0.03

r = mean return, r = 0.07

t = Time to maturity, t = 4/12 = 0.333

N = A normal distribution

σs = Standard deviation (on stock return), σs = 0.4

N= Normal distribution.

Substituting values in the formulae

C = $40 × N(d1) – $45 × e-0.07(0.333) × N(d2­)

C = $40 × N(d1) – $45 × e-0.0233× N(d2)

C = $40 × N(d1) – $45 × 0.977× N(d2)

C = $40 × N(d1) – $43.962 × N(d2) …………………..eq(1)

Recall that:

d1 = [ln( St/K) + (µ + σs2/2)t]/ (σs√t)

d1 = [ln( $40/$45) + (0.03 + (0.42/2)) × 0.333]/(0.4 × √0.333)  
d1 = [-0.11778 + (0.03 + (0.16/2)) × 0.333]/ (0.4 × 0.57)

d1 = [-0.11778 + (0.03 + 0.08) × 0.333]/ 0.231

d1 = [-0.11778 + (0.11 × 0.333)]/ 0.231

d1 = [-0.11778 + 0.03667]/ 0.231

d1 = -0.081/ 0.231

d1 = -0.351

Recall that,

d2 = d1 - σs√t

d2 = -0.351 – (0.4 × √0.333)

d2 = -0.351 – 0.231

d2 = -0.582

Using standard normal table:

N(d1) = 1 – N(0.351) = 1 – 0.6368 = 0.3638

N(d2) = 1 – N(0.582) = 1 – 0.7190 = 0.281

Therefore substituting for N(d1) and N(d2) in eq(1),

C = $40(0.3638) – $43.962(0.281)

C = $14.528 – $12.353.

C = $2.175