Quiz B for 2:30 Class: 11/28/12   Name _____Key_____

Assume your firm is considering whether or not to build a new factory. Your boss has asked you to determine the effect of being able to <u>expand</u> the factory later rather than building a larger factory today. Set up the calculations you would need to provide your boss with an answer.

Information on the factory:
Life of factory = 10 years;
Cost to build factory = $110,000
Present value today of the factory's cash flows: all 10 years = $100,000; first three years = $40,000; first two years = $30,000
Standard deviation of returns on factory: all 10 years = 45%; first three years = 50%; first two years = 60%
Proceeds if sell factory at any time over the next two years = $70,000

Information on possible expansion of factory:
Time over which it is possible to expand = three years
Cost of expansion = $50,000
Present value of expansion's cash flows: PV at the time of expansion = $45,000, PV today = $39,000
Standard deviation of returns on expansion: over next three years = 55%; over next eight years = 40%
Life of expansion = five years (once built)

Returns on U.S. Treasuries: 1-year = 3%; 2-year = 4%; 3-year = 5%; 5-year = 7%; 8-year = 9%; 10-year = 12%

Wall Street Journal Questions are on the back of this page.

$$+6 \left(C = S \times N(d_1) - PV(E) \, N(d_2) \right)$$

$$+11 \quad S = 39,000$$

$$+3 \left(d_1 = \frac{\ln\left(\frac{S}{PV(E)}\right)}{\sigma\sqrt{T}} + \frac{\sigma\sqrt{T}}{2} \right)$$

$$\left(PV(E) = \frac{\overset{+11}{50,000}}{(1.05)^{3+6}} \right) + 6 \; \underset{+11}{\textcircled{34}}$$

$$+3 \left(d_2 = d_1 - \sigma\sqrt{T} \right.$$

$$+11 \quad \sigma = .55$$
$$+6 \quad T = 3$$
$$+1 \Rightarrow \text{lookup } N(d_1) \text{ \& } N(d_2) \text{ on table or with Excel}$$