Quiz A: 8/9/16

Name Key

All Bad Choices (ABC) Inc. is considering building a new factory that will require an investment of \$150 million today and \$100 million a year from today. ABC expects that the new factory will produce its first cash flow two years from today. ABC expects this first cash flow to range between \$10 and \$50 million with an expected value of \$35 million per year through 20 years from today. If cash flows are lower than expected, the factory can be sold any time over the next five years for \$95 million. And if cash flow are greater than expected, the factory can be expanded any time over the next three years at a cost of \$125 million. ABC expects that the expansion would generate cash flows between \$5 million and \$25 million with an expected cash flow of \$20 million per year through 20 years from today. The standard deviation of returns on the new factory equals 35% over its entire life, 40% over the next five years, and 45% over the next five years. The standard deviation of returns on the expansion equals 50% over the life of the expansion, 60% over the next five years, and 65% over the next three years. The risk-free rate varies by maturity to maturity as follows: 1 = 0.56%; 2 = 0.72%; 3 = 0.86%; 5 = 1.13%; 7 = 1.41%; 10 = 1.59%; 20 = 1.91%; 30 = 2.32%. The cost of capital equals 10% for the project and 13% for the expansion.

How does the possibility of <u>selling the factory</u> if sales are lower than expected affect the value of the new plant? Note: You only need to set up all the necessary equations and plug in all the variables. You don't have to solve anything.

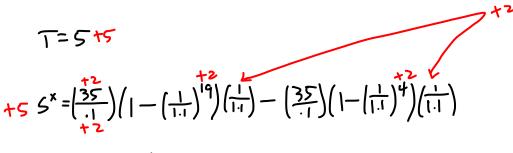
$$+5P = PI(K)(1-N(d_2)) - S^{*}(1 - N(d_3))$$

+5
$$PV(K) = \frac{95}{(1.0113)5+5}$$

+10

+5 dz = d1 - JT
+5 d1 =
$$\frac{lm(\frac{S^{2}}{PVCK})}{TT} + \frac{JT}{2}$$

T = .4 + 10



Look up N(A) + N(Az) on tables or Excel