Session 22: Post class test solutions

1. **d. Invest, but only if the expansion potential comes with exclusivity and you believe that the option to expand has a value greater than $50 million.** The initial investment has a net present value of -$50 million. For the expansion potential to tip the scales, its value has to be greater than $50 million and that can happen only if there is exclusivity.

2. **Inputs to the option pricing model**
   a. \( S = 300 = PV \) of cash flows, if you expand today
   b. \( K = 500 \) = Cost of expansion today
   c. \( r = 3\% \)
   d. \( t = 15 \) (Years of patent life left)
   e. \( \sigma = 25\% \) (from simulation)
   f. \( y \) (Cost of delay) = 1/15 (You will lose one year of patent life by waiting)
   Bonus: The value that I get for \( d_1, d_2 \) and the option are below:
   \( d_1 = -0.6115, N(d_1) = 0.2704 \)
   \( d_2 = -1.5798, N(d_2) = 0.0571 \)
   Value of the option to expand = $11.65 million. You would add this to your DCF value.

3. **e. A long term, large, risky investment to a small company.** The option to abandon will have more value in a risky project than a safe one, a longer term project than a shorter term one and on a large project (relative to the size of the company taking it) than a small one.

4. **c. Company has limited access to capital markets, has positive excess returns and is uncertain about its future investment needs.** For financial flexibility to have value, you have to be uncertain about your future investment needs, make excess returns on those investments and have restricted access to capital markets.