Your boss has asked you to determine how being able to abandon a proposed facility rather than continuing to operate it will affect the value of the facility. Set up the calculations needed to provide him with an answer.

**Information on the facility:**
- Cost to build facility = $105 million
- Present value today of the facility’s cash flows: first three years = $30 million; first four years = $75 million; all seven years = $135 million
- Life of factory = seven years
- Proceeds if sell factory at any time over the next four years = $45 million
- Standard deviation of returns on factory: first year = 30%; first three years = 35%; first four years = 38%; all seven years = 40%

**Information on possible expansion of the facility:**
- Cost to expand at any time over the next three years = $30 million
- Present value of expansion’s cash flows: PV at the time of expansion = $28.5 million; PV today = $24 million
- Life of expansion = seven years (once built)
- Standard deviation of returns on expansion: over next three years = 45%; over next ten years = 50%

**Returns on U.S. Treasuries:** 1-year = 1.5%; 2-year = 2%; 3-year = 2.5%; 4-year = 3%; 5-year = 3.5%; 7-year = 4%; 8-year = 5%; 10-year = 5.5%

\[ P = PVCK (1 - N(d2)) - 5^x (1 - N(d2)) \]

\[ PVCK = \frac{45}{(1.03)^4} + 5 \]

\[ d_2 = d_1 - 0.38 \sqrt{4} \]

\[ d_1 = \frac{- \ln(0.075)}{0.38 \sqrt{4}} + \frac{0.10 \sqrt{4}}{2} \]

\[ 5^x = 125 - 75 \]

\[ \text{look up } N(d) \text{ using Excel or on tables} \]