1. You have been asked to review the valuation of Diplas Inc., a privately owned chemical firm. The firm reported earnings before interest and taxes of $10 million in the most recent year and it was valued by an analyst at $70 million using the average enterprise value to sales ratio of 1.00 at which publicly traded chemical firms trade, and after applying an illiquidity discount of 30%. You believe that the valuation is incorrect on two counts:

- The average pre-tax operating margin of the publicly traded chemical firms is only 5%, and a regression of value to sales ratios against pre-tax operating margins for firms in this sector yields the following:
  
  \[
  \text{Value to Sales} = 0.60 + 8.00 \times (\text{Pre-tax operating margin})
  \]

- You feel that the illiquidity discount should be smaller to reflect the firm’s size. You use the bid-ask spread regression to estimate the discount:
  
  \[
  \text{Bid-Ask Spread} = 0.30 – 0.04 \times (\ln(\text{Revenues}))
  \]

If Diplas has negligible holdings of cash and marketable securities, estimate the correct value of Diplas Inc. (3 points)
2. You have a 30-year lease on a run-down building in New York City that you would like to develop into rental properties. The cost of the conversion today is $15 million – you could borrow $10 million from the bank at 7% and use your equity for the balance - and you estimate the rental revenues each year, if you convert today, will be $1 million a year (before taxes) for the remaining life of the lease. The rental market in New York is a volatile one, though, and the annualized standard deviation in the rental revenues is 25%. The 30-year treasury bond rate is 5%, the market risk premium is 4% and the unlevered beta of real estate companies is 0.60. (The tax rate is 40%.)

   a. Estimate the net present value of conversion today. (3 points)
b. Estimate the value of the lease as an option. (2 points for inputs; 2 points for value)

S =
K =
t =
Standard deviation =
Riskless rate =
Cost of delay (dividend yield) =