Assignment #2 for Managerial Economics, ECO 351M, Fall 2016
Due, Monday Sept 26.

1. From Ch. 8 of Kreps's *Micro for Managers*,
   a. Problem 8.1.
   b. Problem 8.2, any 2 of the 5 parts.
2. From Ch. 8 of Kreps's *Micro for Managers*,
   a. Problem 8.10.
   b. Problem 8.11.
3. From Ch. 9 of Kreps's *Micro for Managers*,
   a. Problem 9.1.
   b. Problem 9.3.
4. From Ch. 9 of Kreps's *Micro for Managers*,
   a. Problem 9.6.
   b. Problem 9.8.
5. From Ch. 9 of Kreps's *Micro for Managers*,
   a. Problem 9.16.
6. From Ch. 10 of Kreps's *Micro for Managers*,
   a. Problem 10.2.
7. Four problems on discrete discounting.
   a. What is the maximum amount you would pay for an asset that generates an income of \$250,000 at the end of five years if the opportunity cost of using funds is %8?
   b. What is the value of a preferred stock that promises to pay a perpetual dividend of \$125 at the end of each year when the interest rate is %5? In which direction would you move the interest rate you use to evaluate this net present value if the company's prospects begin to look riskier? Why?
   c. An owner can lease her building for \$120,000 per year for three years. The explicit cost of maintaining the building is \$40,000, and the implicit cost is \$55,000. All revenues are received, and costs borne, at the end of each year. If the interest rate is %5, determine the present value of the stream of accounting profits, and the present value of the stream of economic profits.
   d. You are in the market for a new frig and you have narrowed the search to two models. The energy-efficient model sells for \$700 and will save you \$45 per year. For the purposes of use, the standard model is indistinguishable from the energy-efficient model except that it costs \$500. Assuming that your opportunity cost of funds is %6, which frig should you purchase?

8. [A problem on continuous discounting] A project accumulates costs at a rate C for the interval $[0, T]$, measured in years, then accumulates benefits, B, in perpetuity, money is discounted continuously at rate r where $r = 0.12$ corresponds to an interest rate of 12% per annum. Fill in the 8 (eight) blank entries in the following table where "$npv(r)$" stands for the net present value at interest rate r.

C	B	T	r	$npv(r)$
10	15	3	0.12	
10	15	3	0.18	
10	15	3	0.24	
10	15	3		0
20	75	8	0.12	
20	75	8	0.18	
20	75	8	0.24	
20	75	8		0

9. You take out a loan for L agreeing to payback at a rate x per year over the course of T years. Interest is continuously compounded at rate r so that $L = \int_0^T xe^{-rt}\,dt$.
   a. Find the payback rate, x, as a function of L, T, and r. Explain the intuitions for why x should depend in the fashion that it does on these three variables.
   b. Find the necessary payback time T, as a function of x, L, and r. Explain the intuitions for why T should depend in the fashion that it does on these three variables, paying special attention to the case that there is no T solving the problem.
   c. Now suppose that bank that is lending you the money believes that your business will fail with probability λdt in any given small interval of time $[t, t + dt)$. Let τ be the random time until you fail, i.e. $P(\tau \leq t) = 1 - e^{-\lambda t}$. If the bank wants to set x such that the expected valued of your repayments until you fail is L, i.e. $E \int_0^\tau x^{-rt}\,dt = L$, find the expected payback rate, x, as a function of L, T, r and λ. [This is one version of what are called risk premia, that is, the extra that someone in a riskier situation must pay.]