Economics 387
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Midterm Exam
Summer 2012

This exam has two (2) questions. Each part of a question is worth the same amount of points as every other part of that question, so allocate your time appropriately. All answers should be explained, rather than simply giving a numerical result.

1. Suppose that the "true" marginal benefit curve for a particular skin treatment is

$MB = 50 – 2V$, where V is the number of visits to the health provider.

The marginal cost per visit is 20. There are 30 patients. One third of the patients get 10 visits per year, one-third get 18 visits per year, and one-third get 24 visits per year.

   a. Graph the relationships above, and indicate the optimal number of visits. Explain why this is optimal.
   b. Calculate the "total benefit" (the area under the MB line) accruing to the 30 patients. Remember that there are 30 of them.
   c. Calculate the total societal costs of the treatment at the levels provided.
   d. Calculate the "welfare loss" to society of the variation in utilization from the optimum.
   e. Discuss briefly why your answer to part d constitutes a loss.

2. Consider the investment in units of health capital with the following function:

$I = 500 – 5 * Age – 800 * cost of capital.$

Suppose that Joe starts his year with 5,000 units of health capital.

   a. Why are the interest rate and the depreciation rate usually considered as determinants of the "cost" of capital.

   b. Provide an interpretation of the Age term and its negative coefficient.

   c. If Joe is 40 years old, the interest rate is 0.03 and the depreciation rate is 0.05, calculate the optimal level of investment.

   d. With the current parameters calculate Joe's aggregate investment (cost per unit multiplied by number of units) this year? Why?

   e. Assuming the interest rate of 0.03 and the depreciation rate of 0.05, what would happen to Joe's aggregate investment if the interest rate were to double? Why?