Principles of Microeconomics
ECON 1101 - Spring 2010

Department of Economics
University of Minnesota

Recitation Questions - March 10th

Lectures: M W F 9:05pm - 9:55pm (Rm. WilleyH 175)
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Hours: M 10:45am - 1:00pm

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Problem 1. This problem will deal with algebra and taxes. Consider the market for oil. Suppose that demand and supply in this market is given by the following equations

\[ P_D(Q) = 350 - 3Q \]
\[ P_S(Q) = \frac{1}{2}Q \]

(a) Algebraically determine the equilibrium for this market.

(b) Sketch this market, clearly labeling the equilibrium. Make sure your P and Q intercepts are in the correct place and that the slopes roughly reflect the information you’re given in the Demand and Supply equations.

(c) Supposing the market is in equilibrium, give both the consumer and producer surpluses (numerical values).

Now suppose that the government levies a tax of $14 per unit of oil.

(d) On your sketch in part (b) illustrate the market with the tax. Clearly label the Consumers Surplus after the tax, Producers Surplus after the tax, Tax Revenue and Deadweight Loss.

(e) What is \( Q^T \) (the quantity consumed/produced after the tax) (a numerical answer)?

(f) What are \( P^T_D \) and \( P^T_S \) (numerical answer)?

(g) Give both the consumer and producer burdens of the tax (how much of the tax do consumers pay, how much do producers pay?) (numerical answers).

(h) Compare the two burdens (which one is larger). Does this seem reasonable? Why or why not (give economic reasoning)?

(i) Give both consumer and producer surpluses after the tax (a numerical answer).

(j) What is the deadweight loss of the tax (a numerical answer)?
Problem 2. Consider the market for laptops. You are told that the demand curve for this market is \( P_D(Q) = 3000 - 150Q \).

(a) The above equation gives the price on the Demand curve for a given \( Q \). Rewrite this equation so that it gives you the quantity demanded, \( Q_D \), for a given \( P \).

(b) Using this information, complete the following table:

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity Demanded</th>
<th>Total Revenue</th>
<th>PED</th>
</tr>
</thead>
<tbody>
<tr>
<td>900</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>1200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** For the PED column, calculate Price Elasticity of Demand between price and quantity in that row and price and quantity in the row above. Use the midpoint formula.

Problem 3. Consider the market for higher education in the U.S. Assume that supply is more inelastic than demand.

(a) Give a possible explanation for why supply would be more inelastic than demand.

(b) Graphically illustrate the market (taking into account this information on supply and demand).

**Now suppose the government decides to subsidize higher education (all federal and state aid, as well as state universities can be modeled as a subsidy) by amount \( s \) per unit.**

(c) Graphically illustrate the market after the subsidy.

(d) Who receives more of the benefit of the subsidy? Why?

(e) Indicate all surpluses before and after the subsidy is imposed using a table.