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Exam 1
Fall 2009

DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO.

Instructions

1. Write your SUID in the upper right corner of this exam. Do NOT write your name.

2. SHOW ALL YOUR WORK. Answers without supporting work will receive little or no credit.

3. There are 72 points possible on this exam and you will have 80 minutes to complete it. *Be sure to budget your time accordingly.*

4. Do all your work on this exam. If you need extra space, write on the backs of the pages. However, if you do write an answer on the back of a page, *be sure you've noted that near the question*.

Area of a triangle: $\dfrac{1}{2}bh$ Area of a trapezoid: $\left(\dfrac{b_1 + b_2}{2}\right)h$

Part 1 (24 points)

Two kinds of buyers, A and B, purchase a particular good. There are 40 buyers of each type (80 total) and the willingness to pay equations for individual buyers shown below. Also shown is the willingness to accept equation for suppliers as a group (the market supply curve).

Type A individual: $W2P_{Ai} = 50 - 2*Q_{Ai}$
Type B individual: $W2P_{Bj} = 50 - Q_{Bj}$
Market supply: $W2A = 8 + (1/150)*Q$.

(a) *12 points*. Please compute the market equilibrium price and quantity, and then calculate the quantity consumed by an individual buyer of each type. Illustrate your results with an appropriate graph or graphs.

Part 1, continued

    (b) *12 points.* Now suppose the government wishes to raise revenue by imposing a $7 tax on sales of the good. Please compute the new equilibrium price and quantity, the total revenue raised by the tax, the changes in surplus experienced by each agent, and the amount of deadweight loss.

Part 2 (24 points)

Suppose a good is supplied by two groups of sellers: domestic firms (D) and foreign firms (F). The domestic firms have a perfectly *inelastic* supply curve at $Q_D = 4000$. The foreign suppliers have a willingness to accept given by $W2A_F = 10 + (1/200)*Q_F$. The buyers of the good have a willingness to pay given by the equation $W2P = 90 - (15/1000)*Q$.

(a) *12 points*. Using the information above, please calculate the market equilibrium price and quantity, and the quantity produced by each seller. Show the equilibrium with an appropriate graph or graphs.

Part 2, continued.

(b) *12 points.* Now suppose a new government policy prohibits imports and the foreign firms can no longer supply any units. Please calculate the new equilibrium price and quantity. Then calculate the change in consumer surplus and the change in producer surplus for each group of firms. Does the policy create deadweight loss? If so, please calculate its value. Who gains and loses from this policy? Explain briefly.

This problem is very loosely based on a question being debated in US climate change policy: whether or not a US policy should allow imports of credits for carbon dioxide reductions abroad.

Part 3 (12 points)

A particular good creates positive externalities and a state government would like the public to consume more of it. Currently, the price of the good is $100 and there are 1000 units traded. It is known that the elasticity of demand for the good is -2 and the elasticity of supply is 1.

No policy is currently in place but a policymaker has suggested using a subsidy to increase consumption to 1200 units. Please calculate the buyer and seller prices that would be necessary to achieve that. Using that information, how large would the subsidy have to be per unit? Finally, please calculate the total cost of the subsidy, the changes in producer and consumer surplus, and the amount of deadweight loss, if any.

Part 4 (12 points)

A city has 2,000 apartments, each of which rents for $1500 per month. A community group has recently proposed a new policy that would limit rents to $1200. The elasticity of supply is known to be 0.5 and the elasticity of demand is known to be -2. Please calculate the effect of the policy on the number of apartments and determine the amount of deadweight loss.