SUID:

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Exam 1

Spring 2017

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

Part 1 (30 points)

A good is purchased by 30 type-A people and 100 type-B people, and it is produced by 140 type-C sellers. The willingness to pay or accept curves for an individual of each type are shown below.

Individual type-A buyer:	WTPai = 200 – (1/2)*Qai
Individual type-B buyer:	WTPbi = 80 – (1/4)*Qbi
Individual type-C seller:	WTAci = (1/3)*Qci

(a) *15 points.* Please compute: ☐ the market equilibrium price and quantity; ☐ the quantity purchased by an individual buyer of type A; and ☐ the quantity sold by an individual seller. ☐ Illustrate the market equilibrium with an appropriate graph.

Part 1, continued

Now suppose the government announces a subsidy of $44 on the good.

(b) *15 points.* Please compute: ☐ the new buyer and seller prices and equilibrium quantity; ☐ the total value of the subsidy paid out by the government; ☐ the new quantity purchased by an individual buyer of type A; ☐ the new quantity produced by an individual seller; ☐ the change in CS received by an individual buyer of type A; and ☐ the change in PS received by an individual seller.

Part 2 (15 points)

A common dispute in international trade is over a practice known as "dumping". Dumping occurs when exporting countries provide subsidies for their exports and thus sell them on world markets below their true cost. It's considered an unfair policy and is against the rules of the World Trade Organization.

Suppose a domestic ("U") and a foreign ("F") producer both make a particular good and sell into the domestic market. At the moment, the price in the market is $1000. Total consumption is 2000 units and the demand elasticity is known to be -0.5. U is selling 1000 units and has a supply elasticity of 1. F is selling the remaining units and has a perfectly elastic supply at the $1000 price. However, it has just been discovered that F has been illegally subsidized by its government at the rate of $300 per unit. F's true unsubsidized WTA_F is $1300 and the foreign government will be required to stop the subsidy immediately.

(a) *15 points*. Please determine what will happen in the domestic market when the subsidy to F ceases. Calculate: ☐ the new equilibrium price and total quantity consumed; ☐ the new quantities produced by U and F; ☐ the change in CS; ☐ the change in U's PS; ☐ the change in the foreign government's revenue; and ☐ the overall change in SS from removing the policy, including any impacts on the foreign government. Finally, ☐ briefly comment on who was gaining and losing from the subsidy while it was in place.

Part 3 (15 points)

Suppose a government would like to impose a $10 tax a good with the market WTP and WTA curves below. Initially there is no tax or subsidy.

$$WTP = 600 - (1/2) * Q$$
$$WTA = (1/8) * Q$$

(a) *15 points.* Please determine: ☐ the initial market equilibrium price and quantity in the absence of the tax; ☐ the new buyer and seller prices once the tax is imposed, as well as the new quantity; ☐ the revenue raised by the tax; ☐ the resulting changes in CS and PS; ☐ the change in SS from the policy. Finally, calculate ☐ how the tax burden is split between buyers and sellers; that is, how much of the total tax revenue is paid by each group?

Part 4 (15 points)

Cross subsidies often arise in public infrastructure, such as water supplies, wastewater treatment systems or in parts of the electric grid. Customers are all charged the same price even though some customers are more expensive to serve than others.

Suppose a small community has a wastewater agency that charges all customers $100 per year. There are currently 10,000 customers of type L who are inexpensive to serve (they live close to the treatment plant). Those customers are also known to have a demand elasticity of -0.5. The agency's WTA_L to serve them is perfectly elastic at $80. The agency also has 5,000 customers of type H who are more expensive to serve (they live further away) and who have a demand elasticity of -0.8. The agency's WTA_H is perfectly elastic but at a price that will need to be deduced. It is also known that the agency is currently running a deficit of $100,000 in the cross subsidy program: the government is having to contribute $100,000 a year to keep the system in operation. Finally, in doing this problem you should assume that using the wastewater agency is not mandatory: either type of customer could switch to a septic system (home treatment) if they choose not to be customers of the agency.

(a) *15 points*. Please determine: ☐ the agency's extra revenue in the L market; ☐ the value of WTA_H; ☐ the new quantity in each market if the cross-subsidy policy were eliminated and the agency charged each group the corresponding WTA; ☐ the change in CS in each market; ☐ the overall change in SS from eliminating the policy.

Additional page for calculations
If you use this, please remember to indicate near the question that part of the answer is here.