SUID:

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Exam 1
Fall 2018

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. If you write an answer on the back of a page, or on the *extra page* at the end, or on an extra sheet of paper, ***be sure you've noted that near the question***.

5. If you use extra sheets of paper, please number them so you can do step 4 above.

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

Question 1 (30 points)

A good is purchased by households of types A and B and produced sellers of type C. Key information about each group is shown below.

Type	**Number**	**Curve**	**Income**
Individual type A buyer	20	$WTP_{Ai} = 180 - Q_{Ai}$	$125,000
Individual type B buyer	80	$WTP_{Bi} = 90 - 0.5 * Q_{Bi}$	$62,500
Individual type C seller	100	$WTA_{Ci} = 30 + Q_{Ci}$	n/a

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

Question 1, continued

Now suppose the government is considering a $28 tax on the good and would like to know how it impacts sellers, and also whether the policy will be progressive or regressive.

(b) *15 points.* Please compute the following when the tax is imposed: ☐ the new buyer and seller prices; ☐ the new equilibrium market quantity; ☐ the change in PS received by an individual seller; ☐ the tax burden borne by a household of each type; and ☐ indicate whether the tax is progressive or regressive, including any necessary calculations.

Question 2 (15 points)

Major trade agreements often include rules applying to labor markets or environmental practices. For example, the revision to NAFTA announced earlier this week stipulates that a specified share of cars exported from Mexico to the US to be made by workers paid at least $16 per hour, which is much higher than the current wage. This question examines those kinds of conditions.

Suppose the market price of a good is currently $1000. A total of 20,000 units are being consumed and the elasticity of demand is known to be -0.5. Domestic firms (U) are supplying 12,000 units and their elasticity is known to be 1.25. Foreign suppliers (F) are known to have a perfectly elastic supply curve with a WTA_F of $1000. There are no trade policies currently in effect but the government is negotiating a trade agreement that would require foreign producers to spend $200 more on labor for each unit of the good they sell to the US. You may assume that this raises WTA_F to $1200, and that the $200 on each unit sold will end up as a transfer to foreign workers. To keep things simple, you may also assume that is the only change made by the agreement: no tariff or quota is imposed.

(a) *15 points*. Please determine the following: ☐ the new market price after the agreement takes effect; ☐ the new total quantity consumed; ☐ the new quantity produced by U; ☐ the new quantity produced by F; ☐ the change in CS; ☐ the change in the domestic PS; ☐ the total change in surplus to buyers and sellers in the US; ☐ the transfer received by foreign workers; and ☐ the overall change in SS for both countries together. Finally, ☐ briefly summarize in words who is hurt and who is helped by this policy.

Question 3 (15 points)

Suppose that consumption of a good creates a positive externality that starts out large but diminishes as Q rises (vaccinations would be an example). The market WTP and WTA curves for the good are given below, as is the MB curve for the externality. Initially there is no tax or subsidy.

$$WTP = 2200 - 4 * Q$$
$$WTA = 400 + 5 * Q$$
$$MB_{ext} = 400 - Q$$

(a) *15 points.* Please determine: ☐ the initial market equilibrium price and quantity in the absence of a policy; ☐ the efficient quantity; ☐ the efficient buyer and seller prices; ☐ the subsidy rate that would move the market to the efficient equilibrium; ☐ the resulting change in CS; ☐ the change in PS; ☐ the change in government revenue; ☐ the change in the benefits created by the externality; and ☐ the change in SS from the policy.

Question 4 (15 points)

Amazon Prime is an example of a cross-subsidy policy because subscribers have free shipping no matter where they live. Amazon pays for that, in part, by building an average shipping cost into its prices. (Memberships in Prime also help cover the costs but we'll leave that out to keep the problem simpler.) Suppose, for example, Amazon builds an average shipping cost of $6 into the price of a product it sells. Two groups of Prime customers buy the product. Local customers (L) live near Amazon's warehouses and it costs Amazon $5 to ship them the product. Remote customers (R) live much further away and Amazon has to pay more to ship to them. Other initial information is provided below. Amazon is currently breaking even on shipping to the two markets.

Variable	**L**	**R**
Initial Q	10,000	5,000
Built-in shipping cost	$6	$6
Actual shipping cost	$5	See below
Demand elasticity	-2	-2

(a) Please determine: ☐ Amazon's extra revenue in the L market; and ☐ Amazon's shipping cost to the R market. Now let's look at the impact of the policy. Suppose Amazon's base price for the product before shipping is $14, so it is now selling the product for $20. If it eliminated the cross subsidy, it would charge each buyer $14 plus its actual shipping cost. In that case, please determine: ☐ the new quantity it would sell in each market; ☐ 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.