SUID:

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Exam 1
Fall 2019

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. You may write on the backs of pages, on the extra page at the end, or on extra sheets of paper but **BE SURE TO NOTE 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	50	$WTP_{Ai} = 400 - 0.5 * Q_{Ai}$	$80,000
Individual type B buyer	100	$WTP_{Bi} = 400 - Q_{Bi}$	$30,000
Individual type C seller	400	$WTA_{Ci} = 40 + Q_{Ci}$	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 $12 tax on the good and would like to know how it affects type A individuals, how the burden of the tax is distributed between buyers and sellers, and 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 new quantity purchased by an individual household of each type (both A and B); ☐ the change in CS received by an *individual* household of type A; ☐ the percentages of the tax burden borne by buyer and sellers; and ☐ whether the tax is progressive or regressive, including any necessary calculations.

Question 2 (15 points)

An argument made in support of certain tariffs is that they are necessary to protect "infant industries" (small, new industries that a country wants to nurture) against international competition. This question explores how that might work.

Suppose the market price of a good is currently $200 and there are no tariffs in effect. A total of 10,000 units are being consumed and the elasticity of demand is known to be -0.8. Foreign firms (F) are currently selling 9,000 of the units and their supply is perfectly elastic at $WTA_F = \$200$. The remaining 1,000 units are produced by local (L) firms, and their supply is known to have an elasticity of 2. The government is being pressured to impose a tariff that would double local production of the good. It would like to know how high the tariff would have to be and what impacts it would cause.

(a) *15 points*. Please determine the following: ☐ the tariff needed to achieve the output target for local firms; ☐ the new market price; ☐ the new total quantity consumed; ☐ the new quantity produced by L firms; ☐ the new quantity produced by F firms; ☐ the change in CS; ☐ the change in the PS of local firms; ☐ the total tariff revenue received by the government; ☐ the overall change in SS; and ☐ briefly comment on the cost of this policy relative to what it delivers.

Question 3 (15 points)

Suppose a government is concerned about a good that creates a positive externality once a critical mass of customers uses it. Fax machines were an example, and many other goods with network externalities have this characteristic as well (as do many social movements). In this case, suppose the externality begins to occur when Q reaches 140 units and grows as Q gets larger. 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.

$$WTP = 1600 - 3 * Q$$
$$WTA = 100 + 2 * Q$$
$$MB_{ext} = 1 * (Q - 140)$$

(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)

An important issue that arises in tax policy is whether it's better to raise revenue using a large tax in a narrow part of the economy or a smaller but broader tax that affects more markets. This problem explores that question.

Suppose a government needing to raise additional revenue is evaluating two potential tax policies. Policy 1 would impose a $20 tax on good X and no tax on a second good Y. Policy 2 would instead impose a $10 tax on X and a $10 tax on Y. To keep things simple, suppose there are no taxes in place now and the X and Y markets start out the same: the supply of each good is perfectly elastic at $200 (suppliers of both have a WTA of $200), the elasticity of demand for each good is -2, and initially 10,000 units of each good are sold. The government would like your advice on which policy it should adopt.

(a) Please: ☐ determine the revenue and deadweight loss for each of the policies; ☐ indicate which one is better; and ☐ briefly explain why.

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