SUID:

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Exam 1

Fall 2010

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

Part 1 (24 points)

A good is produced by two kinds of sellers: large (L) and small (S) firms. There are 4 large firms and 160 small ones. The willingness to accept equations for a typical firm of each type are shown below. Also shown is the willingness to pay equation for buyers as a group (the market demand curve).

Typical large firm:	$W2A_{Li} = 2*Q_{Li}$
Typical small firm:	$W2A_{Sj} = 20*Q_{Sj}$
Market demand:	$W2P = 800 - (1/10)*Q$

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

Part 1, continued

(b) *12 points.* Now suppose the government wishes to increase consumption of the good by providing a $100 subsidy per unit to the sellers.

Please compute the new equilibrium price and quantity, the total cost of the subsidy to the government, the change producer surplus, the change in consumer surplus and the amount of deadweight loss.

Part 2 (24 points)

Suppose a good is supplied by two sellers: firm R and firm F. Firm R has a perfectly elastic supply curve with W2Ar = 100 and firm F's supply is given by W2Af = (1/8)*Qf. Buyers of the good have W2P = 200 – (1/10)*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 that firm F's production process generates pollution but firm R's does not. (You can think of F and R as fossil-fueled and renewable electricity generation.) The government wants to reduce firm F's production by imposing a $50 tax on its output. The tax *only* applies to firm F: firm R's output is *not* taxed. Buyers regard the output of the firms as interchangeable and therefore pay the same price for either product.

Please determine the new equilibrium price and quantity. Then calculate the output of each firm, the change in its producer surplus, and the change in consumer surplus.

Part 3 (12 points)

A government is eager to raise revenue and is considering applying a $4 tax to a particular good. However, it is also worried about employment and would not adopt the tax if doing so would reduce production of the good by 10% or more. The good's elasticity of demand is known to be -0.4 and supply is perfectly elastic at W2A = $20. There is no tax at the moment and 10,000 units are being sold.

(a) *12 points*. Please determine whether the tax would violate the employment guideline. Then calculate the amount of revenue it would raise (whether or not it violates the guideline) and the amount of DWL it would cause.

Part 4 (12 points)

Suppose a state has 1 million low-skilled workers who each earn $8 an hour. The legislature would like to impose a higher minimum wage but is unwilling to have more than 50,000 workers lose their jobs as a result. The elasticity of demand for labor is known to be -0.5, and the elasticity of labor supply is 1.

(a) *12 points*. Please determine the highest minimum wage consistent with the legislature's goal of limiting job *losses* to 50,000. Then determine the total number of people who will be unemployed at the new wage, and the effect of the policy on the surplus received by firms.