SUID:

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Exam 1

Fall 2015

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 purchased by 100 type-A people and 10 type-B people. The willingness to pay curves for an individual of each type are shown below. The good is produced by 105 type-X sellers, each of which has the willingness to accept curve shown below.

Individual type-A buyer:	WTPai = 800 – Qai
Individual type-B buyer:	WTPbi = 200 – (1/10)*Qbi
Individual type-X seller:	WTAxi = (1/10)*Qxi

(a) *12 points.* Please compute: ☐ the market equilibrium price and quantity; ☐ the quantity purchased by an individual buyer of each type; 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 $25 on the good.

(b) *12 points.* Please compute: ☐ the new buyer and seller prices and equilibrium quantity; ☐ the total value of the subsidy; ☐ the new quantity purchased by an individual buyer of each type; ☐ 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 (12 points)

This question investigates the effect of technology breakthroughs on existing markets (loosely modeled on the introduction of horizontal drilling and hydraulic fracturing in the oil industry). Suppose that initially a good is supplied by a single conventional producer, C, and the following facts are known: the market is in equilibrium, the price is $100, total consumption is 2000 units, the elasticity of demand is -0.5, and the elasticity of C's supply is 2. Then a new technology is invented and new supplier, N, appears in the market with a perfectly elastic supply curve at WTAn = $80.

(a) *12 points*. Please determine: ☐ the new equilibrium price and total quantity consumed; ☐ the new quantities produced by C and N; and the changes in ☐ CS and ☐ PS for each producer. Finally, ☐ how much better or worse off is the economy overall?

Part 3 (12 points)

Suppose a good is produced by two suppliers, C and D. Initially there are no taxes or subsides and the market is in equilibrium at a price of $50 with 800 total units consumed. The following additional facts are known: the demand elasticity is -1; supplier D is initially producing 600 units and has a supply elasticity of 2; and supplier C is initially producing 200 units has a perfectly elastic supply curve at WTAc = $50.

Now suppose that each unit sold by supplier C creates a positive externality of $10. The government is considering a new policy that would account for the externality by providing a subsidy of $10 on purchases from C.

(a) *12 points*. Please evaluate the policy by determining the following: ☐ the new equilibrium buyer price and total output in the market; ☐ the new outputs by C and D; ☐ the change in CS and PS; ☐ the total cost of the subsidy to the government; and ☐ the change in benefits from the externality. What is the overall change in social surplus from the policy? Is it an improvement?

Part 4 (24 points)

A government is considering imposing a tax to reduce consumption of a good. The good is purchased by two buyers, L and H, and produced by one seller, Z. The WTP and WTA curves for L, H and Z are given below. Initially there is no tax in the market.

Type L buyer:	WTPl = 300 – Ql
Type H buyer:	WTPh = 1200 – 10*Qh
Type Z seller:	WTAz = Qz

(a) *8 points*. For the original equilibrium without the tax, please determine: ☐ the equilibrium price and market quantity; and ☐ the values of Ql, Qh, and Qz.

Part 4, continued

Now suppose the government imposes a tax of $42 on the good.

(b) *16 points.* Please determine: ☐ the new equilibrium Pd, Ps, market quantity and total tax revenue that would occur if the tax is imposed; the new values of Ql, Qh, and Qz; and ☐ the tax burden on each buyer and seller (that is, the transfer from each buyer or seller to the government). ☐ Which of the two buyers has the larger tax burden? ☐ Briefly explain why that happens.