

SUID:

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**Exam 1**  
Fall 2005

**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 100 points possible on this exam. Some of the questions count for more points than others. *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.*
5. You may *not* discuss the exam with anyone until after 2:00 pm today.

**Part 1 (25 points)**

US refineries usually have the capacity to produce about 9 million barrels of gasoline a day. Hurricanes Katrina and Rita have temporarily reduced that by about 15% for the next 28 days. This question asks you to evaluate the effect of the capacity reduction on gasoline producers and consumers.

You may assume that the supply of gasoline is perfectly inelastic (at 9M barrels initially and at 7.65M barrels during the 28 day period); that all of the idle refineries come back on line after 28 days; and that there are no imports of gasoline. In addition, the following information may be useful: the price elasticity of demand for gas is -0.3, and the national average price of gas *before* the hurricanes was \$2.50 per gallon.

Calculate the price of gasoline during the 28 day period that capacity is reduced. Using that information, calculate: the daily effect on producers and consumers; the total effect on producers and consumers over the whole 28 days; and the total deadweight loss, if any. Please illustrate your answer with an appropriate and well-labeled graph.

**Part 2 (20 points)**

A government is considering a new tax on a particular good and you have been asked to evaluate the effects of the tax on different groups in the economy. The good is currently untaxed and sells for a price of \$100. Two groups in the economy buy the good. Group A buys 1000 units and has a demand elasticity of -0.2. Group B also buys 1000 units but its demand elasticity is -1.0. If the government were to levy a tax of \$50 per unit on the good, how would each group's consumer surplus change? How much revenue would the tax raise from each group? What is the deadweight loss per dollar of revenue for each group? Discuss briefly. You may assume that the supply of the good is perfectly elastic.

**Part 3 (35 points)**

Suppose that the market demand and supply for a particular good are given by the equations below:

$$W2P = 14,000 - 5 * Q$$

$$W2A = 2,000 + Q$$

(a) Calculate the initial market equilibrium. What will the price and quantity be?

(b) Now suppose the government begins providing a \$1,200 subsidy on sales of the good. The subsidy is paid to the seller on each unit sold. Solve for the new equilibrium price and quantity.

**Part 3, continued.**

- (c) Draw a diagram illustrating the new equilibrium and indicate how the subsidy affects the surplus received by consumers and producers. Also indicate government revenue and deadweight loss, if applicable. *Note: you need to show these areas clearly in a diagram but you do NOT need to calculate their numerical values.*

**Part 4 (20 points)**

A city currently has an unregulated housing market but is considering adopting a rent control ordinance. At the moment, the market is in equilibrium, with a rental price of \$1000 per month and a quantity of 25,000 apartments. The elasticity of demand for apartments in this particular city is -0.5 and the elasticity of supply is 1.0. If the city adopts a rent control ordinance setting a maximum rent of \$800, what would be the new market quantity? Calculate the effect of the ordinance on the surpluses of renters and landlords.