15.010 / 15.011 Economics Analysis For Business Decisions

HOMEWORK SET #1

(Due Tuesday, September 21st, 2004)

Name: _____

Section: _____

Please staple this sheet to the front of your answer set.
Do NOT write your answers on this sheet.

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DIRECTIONS: Answer all questions and show your work. Your completed homework is due in class or may be placed in the assignment box for your section before 4:30 p.m. *Late homework sets will not be corrected.* Please read the statement on 15.010/15.011 homework policy contained in the course overview.

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1. Decide whether each of the following three statements is **True**, **False**, or **Uncertain**, and give a brief but clear explanation why.   (Note: these questions provide practice for the True, False, Uncertain section on the midterm and final exam)

    a. Some consumers strongly prefer Pepsi and some strongly prefer Coke. Therefore there is no single market for colas.

    b. Suppose that a tax on gasoline is imposed to encourage fuel efficiency. Over the following few years, the share of the tax paid by consumers will gradually fall.

    c. The mayor of Boston and other housing advocates are in favor of re-imposing rent controls on apartment units. (Rent control keeps apartment rents below their free-market levels, a practice that was abolished in 1994.) Suppose that the supply of apartment units is completely price-inelastic. Then once rent controls are imposed, there will be no deadweight loss to society.

2. The market for high definition television sets (HDTV's) in the U.S. can be expressed by the following demand and supply equations:

    Qd = 7500 – 2400P,

    Qs = 600P,

    Where Q is the number of HDTV's, and the price P is in thousands of dollars.

    a. Calculate the equilibrium price and quantity that will prevail in a free market.

    b. Calculate the elasticities of demand and supply at the equilibrium.

    c. Calculate the consumer surplus and producer surplus at the equilibrium.

    d. Suppose that the U.S. government provides a subsidy of $300 per television in an effort to accelerate the adoption of HDTV. What will be the new equilibrium price paid by consumers and quantity bought?

    e. Is there a net welfare loss to society under the subsidy program? If not, why not? If so, what is the size of the net welfare loss?

3. At present, the price of a football in the U.S. is $15, and 5 million are sold annually. Market research has shown that the demand curves are linear, and that price elasticity of market demand is –4.0 and the price elasticity of supply is +2.0.

    a.   Calculate the demand and supply curves for footballs for the U.S.

    b.   The U.S. government proposes a $3 tax on every football sold in the country. How much revenue will the tax raise, and how will the tax affect consumer surplus and producer surplus?

4. A client has provided you with data on the price of cars, the price of gasoline, the quantity of new cars sold in each of a number of countries. In addition you observe Gross Domestic Product per capita (GDP is a measure of national income and 'per capita' means per person.) Using the techniques that you will soon learn in DMD, you use the data to estimate the following log–linear market demand equation for new cars:

$$\ln Q^{cars} = 5 - 2.4 \ln P^{cars} - 1.2 \ln P^{gasoline} + 0.5 \ln (\text{GDP per capita})$$

    a.   What is the estimated elasticity of demand for new cars with respect to the price of cars?

    b.   What is the estimated elasticity of demand for new cars with respect to the price of gasoline?

    c.   What is the estimated elasticity of demand for new cars with respect to GDP per capita?

    d.   Use the equation to calculate the estimated elasticity of demand with respect to GDP per capita when 1,000,000 new cars are shipped each year, GDP is 1.3 trillion U.S. dollars, and 250 million people live in the country.