

**Homework Assignment 10. Due: Tuesday, April 26.**

1. (1 point) Assume that the demand equation is given by  $P = 99 - 3Q$ . If the original price of the good was \$9 and a \$2 tax was imposed, how much marginal excess burden will be created?
2. (1 point) The equation of MC of unreported income is  $MC = 4 + 2X$ , and the MB of unreported income is  $MB = 44 - 3X$ , what will be the amount of unreported income? How much of a change will there be if enforcement becomes more strict, resulting in  $MC = 9 + 2X$ ?
3. (1 point) Suppose that mayor of Ames wants to build a stadium to attract a professional baseball team to the town. To finance this project two alternatives are considered – impose a 2-year sales tax of 10% or impose a 20-year sales tax of 1%. Assuming that the interest rate is zero, which approach will yield more efficient outcome?
4. (1 point) Luxury goods usually have very high demand elasticities. On what grounds could we justify the relatively heavy taxation of such goods?
5. (1 points) Suppose the demand for good X can be represented by the following equation:  $Q_d = 22 - (1/4)P$ . Furthermore, suppose that the demand for good Y can be represented by  $Q_d = 50 - P$ . The prices of both goods are equal to \$10. Suppose that an *ad valorem* tax is placed on both goods. Good Y is taxed at a rate of 5%. To ensure that the inverse elasticity rule holds, what must be the rate at which good X is taxed? (Hint: Elasticity at a given price is found using the formula  $\epsilon = - (1/S)(P/Q)$ , where S is the slope of the demand curve, Q is the quantity demanded, and P is the price.)
6. (2 points) Consider a country with the following progressive tax system – low income is taxed at 0%, moderate income is taxed at 15%, high income is taxed at 28%. The individuals in this country are considering whether to invest in municipal bonds. The market rate of return is 20%.
  - a. What rates of return on municipal bonds would induce low-income people to invest in these bonds? What about moderate and high income people?
  - b. Now suppose that each income group has exactly \$100 in total to invest (or not invest) in municipal bonds. What rate of return would municipality offer if it needs to raise exactly \$100? How much money it would save (compared to market rate of return)? How much money would the federal government lose?
  - c. What rate of return would municipality offer if it needs to raise exactly \$200? How much money it would save (compared to market rate of return)? How much money would the federal government lose?
  - d. Based on your answers in (b) and (c) comment on whether preferential tax treatment is the best way to support local governments? Why does such system exists in U.S.?

7. (2 points) Consider the following investment opportunity. The asset is worth \$100 now and it offers the rate of return  $r=10\%$  each year for the next 20 years. Suppose that the asset value gain is not realized until it expires in 20 years.
- Assume that only realized gains are taxed at 15%. What is the value of this asset to the investor in 20 years?
  - Now suppose that any gains (realized and not realized) are taxed at the same rate of 15%. What is the value of the asset to the investor in 20 years?
  - Is there any lock-in effect resulting from preferential tax treatment of unrealized capital gains?
8. (1 point) What are the advantages and disadvantages of a flat income tax?