

Due: Friday, April 26

1. Consider the markets for butter (B) and margarine (M), where the demand curves are  
 $Q_M = 20 - 2P_M + P_B$  and  $Q_B = 60 - 6P_B + 4P_M$   
and the supply curves are  
 $Q_M = 2P_M$  and  $Q_B = 3P_B$ .
  - a) Find the equilibrium prices and quantities for butter and margarine.
  - b) Suppose that an increase in the price of vegetable oil shifts the supply curve of margarine to  $Q_M = P_M$ . How does this change affect the equilibrium prices for butter and margarine? Using words and graphs, explain why a shift in the supply curve for margarine would change the price of butter.
2. Joe and Mary each consume food and clothing. Joe's MRS is 3F for 2C. Mary's MRS is 1F for 1C. Describe a transaction that would result in a Pareto improvement.
3. Consider an economy that produces two goods, food (x) and clothing (y). Production of both goods is characterized by constant returns to scale. Given current input prices, the marginal cost of producing clothing is \$10 per unit, while the marginal cost of producing food is \$20 per unit. What is the marginal rate of transformation of x for y? How much clothing must the economy give up in order to get one additional unit of food? Illustrate in a diagram.
4. Why is it not generally socially efficient to set an emissions standard allowing zero pollution?
5. Consider an economy with two individuals. Individual 1 has an inverse demand curve for a public good given by  $P_1 = 60 - 2Q_1$ , while individual 2 has an inverse demand curve for the public good given by  $P_2 = 90 - 5Q_2$ . The prices are measured in \$ per unit. Suppose the marginal cost of producing the public good is \$10 per unit. What is the efficient level of the public good? Illustrate.