

Problem Set 7
Due: November 2nd.

1. Please write your name and name of your TA on the top of your solutions.
2. Problem sets are due IN SECTION/RECITATION. Late Problem sets will not be accepted under any circumstances

1. True or False (18 points)

- a) Under perfect competitive market, since the firm's maximized profit is zero, so marginal revenue is always not equal to long run marginal cost. (8 points)
- b) If the market is perfect competitive, the government can not improve efficiency by imposing a price ceiling or price floor. (5 points)
- c) In an Edgeworth box, all points of tangency between the indifference curves are efficient (if tangency is applicable). (5 points)

2. (20 points) Suppose the oil price in world market is \$60 per gallon, the U.S. domestic demand curve of oil is

$$Q^d = 200 - 2p$$

and domestic supply curve is

$$Q^s = \frac{1}{3}p$$

- a) (10 points) If U.S. government imposes a tariff of \$15 per gallon, what will be the U.S. price and the level of import? How much revenue will be the government earn from the tariff? How large is the deadweight loss?
 - b) (10 points) If the U.S. government has no tariff but imposes an import quota of 25, what will be the domestic price? what is the cost of this quota for U.S. consumers of the oil? What is the gain for U.S. producers?
3. (20 points) The supply curve for alcohol is $q_s = 2p - 1$, and demand curve is $q_d = 8 - p$. Suppose that the local authority starts to tax alcohol at \$1.5 per unit.
- a) (5 points) Calculate the equilibrium price and quantity before the authority starts to tax.
 - b) (5 points) Calculate the loss in producer's surplus.
 - c) (5 points) Calculate the revenue generated by tax.
 - d) (5 points) What percentage of the burden of the tax falls on producer.

4. (42 points) Ann and Bob are two individuals. They both consume Food and Cloth. Ann's utility function is

$$U_A(F, C) = F^2C$$

and Bob's utility function is

$$U_B(F, C) = FC$$

Suppose that Ann is endowed with 9 units F and 3 units C, but Bob is endowed with 6 units F and 6 units C.

- a) (5 points) Write expression for Ann and Bob's marginal rate of substitution;
- b) (7 points) Draw the Edgeworth box and mark the initial endowment point;
- c) (5 points) Point out the area in the box that represents all the bundles that make both of them better off, comparing with initial endowment;
- d) (7 points) Derive the contract curve;
- e) (18 points) Find the general equilibrium of the above economy and calculate the welfare gain of the society through exchange;