

Problem Set #1
Due September 21, 1998

1. a) Graph demand curves for the following consumers. Be sure to label them with numbers to indicate important points on the graphs, including where they cross the axes and any kinks.
 - i) Consumer A whose demand is given by $Q = 10 - 2P$.
 - ii) Consumer B whose willingness to pay is given by $P = 7 - 0.25Q$.
 - iii) Consumer C who is willing to spend a total of $T = 16Q - 2Q^2$, where Q is the quantity bought.
 - iv) Consumer D who is willing to pay \$6 per unit for up to one unit, \$4 for up to a second unit, \$1 for up to a third, and won't buy more than three at any price.
 - v) Consumer E who will pay no more than \$2 per unit of the good, will willingly buy anything from 0 to 4 units at that price, and will buy no more than 4 units at any price.
 - vi) Consumer F who will spend a total (price times quantity) of \$12 on the good, regardless of how much that will buy, regardless of price.
- b) Graph the market demand curves for markets composed only of the following consumers from part (a):
 - i) Consumers A and B
 - ii) Consumers A, C, and E.

2. Four firms each have constant but different marginal costs as shown in the table at the right. They also have capacity constraints that prevent them from producing more than the maximum amount indicated. Government, the only demander in this industry, wants 24 units of the good.

Firm	MC	Capacity
A	4	8
B	8	6
C	2	10
D	6	12

- a) If each firm charges a price equal to its own marginal cost, how much will the government spend if it buys an equal number of units from each firm?
- b) Under the pricing assumption of part (a), could the government save money by buying different amounts from the different firms? Why? How?

- c) Graph the supply and demand curves for this market and find the competitive market equilibrium price.
- d) How much does the government spend in the market equilibrium you just found, and how much does it buy from each firm? How does this outcome compare to the others that you have looked at above?

3. The demand for noodles in Hong Kong per day is given by

$$P = 40 - 10Q$$

where Q is the quantity of noodles sold per day, in millions of bowls, and P is the price in HK\$ per bowl. Suppliers of noodles make them available at a constant cost of HK\$20 per bowl. Recognizing the unique health benefits of noodles, the Hong Kong government is considering providing a subsidy to their production of HK\$2 per bowl.

- a) Without the subsidy, calculate the market equilibrium quantity and price of noodles in Hong Kong.
 - b) Hong Kong's GDP is in the neighborhood of US\$100 billion. (Note this is US\$, not HK\$.) Approximately what percentage of Hong Kong's GDP is noodles, if the above information is correct? (Make explicit any additional assumptions that you make.)
 - c) If the proposed subsidy is provided, what will be the new quantity of noodles produced and consumed, how much will consumers pay per bowl and how much will suppliers receive?
 - d) Calculate the changes in consumer surplus and producer surplus due to the subsidy. How much will the subsidy cost the government?
 - e) If consumers are unaware of these health benefits, how much would the benefits have to be worth in order for this subsidy to be a socially desirable policy? How would your answer to this change if the health benefits of noodles are correctly perceived by consumers?
4. Suppose that the data for the sugar market used in Tarr and Morkre are all correct except that the world price of sugar, instead of being 15 cents per pound, is 10 cents per pound. Recalculate, under that assumption, the effects of an import quota that is used instead of a production subsidy to maintain sugar producers' revenues at 21.8 cents per pound. That is, recalculate the effects reported in Tarr and Morkre's Table 4.4. You need not be exact here, but do make clear how you get your results.