Homework 4

Due on Oct 26

Choose the best answer

1. The market demand curve for any good is
    a. independent of individuals' demand curves for the good.
    b. the vertical summation of individuals' demand curves.
    c. the horizontal summation of individuals' demand curves.
    d. derived from the firm's marginal cost of production.

2. In the very short run
    a. new firms may enter an industry.
    b. existing firms may change the quantity they are supplying.
    c. price and quantity supplied are absolutely fixed.
    d. quantity supplied is absolutely fixed.

3. If the market for bottled spring water is characterized by a very elastic supply curve and a very inelastic demand curve, an outward shift in the supply curve would be reflected primarily in the form of
    a. higher prices.
    b. higher output.
    c. lower prices.
    d. lower output.

4. In the short run, a sales tax is
    a. wholly absorbed by the producer.
    b. shared between the consumer and the producer.
    c. deferred until the market is able to re-establish an equilibrium price.
    d. wholly absorbed by the consumer.

Analytical questions

1. Consider a generic firm in a perfectly competitive industry with price p. Its average cost is

$$AC(q) = \frac{16}{q} + q.$$

    a. What is the total cost and marginal cost of this firm?
    b. Find the long run supply curve of this firm. Be careful of the zero profit point.
    c. Suppose there are 30 firms with this same technology, what is the market supply?
    d. Suppose there is free entry to the industry and all firms have the same technology. The market demand of this industry is

$$Q_D(p) = 160 - 10p.$$

What will be the long run equilibrium price and the number of firms of the industry?

2. For the car industry of nation A, the market demand is

$$Q_D(P, I) = 2000 \times P^{-2}I^{0.5},$$

where I is income.

a. Compute the price elasticity $e_{D,P}$ and income elasticity $e_{D,I}$ of the car demand

b. Suppose there is a 10% increase of income I. We do not know the supply function $Q_S(P)$, but knows that the supply elasticity is $e_{S,P} = 3$ from empirical data. Predict how much the equilibrium price will increase (in percentage).

3. Consider the car industry in nation C. The domestic demand for car can be represented by inverse demand

$$p^D(q) = 40 - \frac{1}{2}q.$$

The domestic car inverse supply is

$$p^S(q) = \frac{1}{2}q.$$

a. If nation C probibit international trade, calculate equilibrium price, quantity, consumer surplus, (domestic) producer surplus.

b. If nation C allow for free trade. The world price of car is 10. How many cars will nation C import? Use a diagram to illustrate the effect. Calculate consumer surplus, (domestic) producer surplus.

c. The domestic car producers successfully convinces the government to product "infant industry". The government decides to impose a tarriff of 5 on each car imported. Illustrate the new equilibrium on the graph you draw for (b), how many cars will nation C import? How much tariff revenue will the government collected?

d. If the government replace the policy of tariff by a import quota of 20. Compare to the tariff case in (c), which party is worse-off? Which party is better-off?

4. The cost function of a firm is given by

$$C(q) = q^2 + 4q + 4.$$

a. Suppose that the firm is operating in a perfectly competitive market and the current price is p. What is the firm's supply function? Draw a demand-supply diagram. Clearly indicate which part denote the supply curve (be careful on the shutdown point).

b. Compute the change of producer surplus when the price rises from $p = 5$ to $p = 6$.

c. Suppose that the firm is operating in a market with downward-sloping market demand curve $Q_D(p) = 20 - p$ and there is no entry barrier. Potential entrants of this market all have the same cost function. Compute the LONG RUN equilibrium of this market with price, quantity, and number of firms.

4. Textbook exercise 12.2

5. Textbook exercise 12.3

6. Textbook exercise 12.6