

due : Wednesday November 8    before class

Do all 5 questions. Each counts 20%.

1. What is the equation of the supply curve of a firm which has a total cost function with the equation

$$TC(q) = (q - 4)^3 + 10q + 64$$

where  $q$  is the quantity of output produced by the firm?

2. What is the equation of the long-run supply curve for an industry, if the industry contained 100 firms, each with a (long-run) total cost function  $TC(q) = (q - 4)^3 + 10q + 64$ , 100 more firms, each with a (long-run) total cost function  $TC(q) = (q - 4)^3 + 20q + 64$ , and 100 more firms, each with a (long-run) total cost function  $TC(q) = (q - 4)^3 + 30q + 64$ ?

3. Suppose that the aggregate quantity demanded of a product by all males in a market had the equation

$$Q^m = 24 - \frac{p^m}{2}$$

where  $Q^m$  is the quantity demanded by men, and  $p^m$  the price charged to men, and that the aggregate quantity demanded by all females was

$$Q^f = 24 - p^f$$

(where  $Q^f$  is the quantity demanded by females, and  $p^f$  the price charged to females)?

The product is supplied by a monopoly, with a constant marginal cost of production of 4.

What profit would the monopoly earn if it could charge different prices to males and females?  
What profit would it earn if it had to charge to same price to males as to females?

**over**

4. Find a Cournot equilibrium for an industry containing 10 identical firms, each of which had a total cost function

$$\begin{aligned}TC(q) &= 15 + q \quad q > 0 \\ &= 0 \quad q = 0\end{aligned}$$

if the market demand for the good produced by the firms was

$$Q = 13 - p$$

where  $p$  was the price of the good?

5. Suppose that the firms in the industry described in question #4 above chose prices simultaneously, instead of quantities. Just as in the Bertrand model, consumers all buy from the lowest-priced firm, with the following modification to the Bertrand model : if all firms charge the same price, then all the consumers choose to buy from firm #1 (and if two firms  $i$  and  $j$  charged the lowest price, with  $i < j$ , all consumers would buy from firm # $i$ , and so on).

What would the equilibrium be in this industry?