

ECON 480
Economics of Industrial Organization
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Sample problems
Second in-class exam

Problem 1

There are two firms in the market producing an identical product. If both firms charge the same price, then total demand is given by $D(p)=40-p$. The cost structure of each firm is summarized by the cost function $C(q)=10q$ where q is the quantity produced by that firm.

1-Suppose firms compete on volume and choose their quantities simultaneously. What are the equilibrium quantities, prices and profits?

2-Suppose firms compete on price and choose their prices simultaneously. What are the equilibrium quantities, prices and profits?

3-Suppose firms collude. What are the equilibrium quantities, prices and profits?

4-Compare and discuss.

Problem 2

A firm is the unique producer of a good and faces demand $D(p)=40-p$. Its cost function is $C(q)=10q$. A second firm is planning to enter the market. If it does, it will have to pay a set-up cost $K>0$ and then will produce each unit of good at cost 10. In order to discourage entry, the incumbent claims that if entry ever occurs, it will compete in price rather than in quantity. However this may not be credible.

1- Identify the game and describe it fully.

2- Characterize the equilibrium. In particular, determine under which condition the second firm enters at equilibrium. Is the threat credible?

Problem 3

Two downstream firms sell an identical product to consumers and face demand $D(p)=40-p$. They compete on volume. To produce, they only need 1 unit of input for each unit of output. They purchase the input from a monopolist upstream firm. The upstream firm sets a price w for the input. It costs the upstream firm 10 to produce each unit of input. First, the upstream firm sets a price. Second, downstream firms decide how much to produce and at what price, and therefore how much input they need.

1- What are the equilibrium prices (input and output) and quantities.

2 - Suppose the upstream firm integrates with one downstream firm and does not serve the remaining downstream firm (then, it exits). What are the equilibrium prices (input, and output) and quantities? Discuss.

Problem 4

There is a continuum of consumers located on the line $(0,1)$. Firm 1 is located in 0. Firm 2 plans to enter the market. The market is regulated and firms must offer the same price independently of their location. This price is denoted by p . At date 1, Firm 2 decides where to locate. Choosing a location k in $(0,1)$ is costly: for each unit of differentiation, the firm incurs a cost of 10 (so, locating at k costs $10k$). At date 2, consumers decide whether to buy from firm 1 or firm 2. If a customer located at x in $(0,1)$ buys from a firm located at y (obviously where $y=0$ if this is firm 1 and $y=k$ if this is firm 2), his total cost is $p+(x-y)^2$. Assume that the firms share the demand equally if $k=0$.

1- Suppose firm 2 locates at k . What is the demand for each firm?

2- Where does Firm 2 locate? Explain

3- Compare the situation where Firm 2 locates at 0 versus 1 from the perspective of consumers.