Intermediate Microeconomics Exercise Class 7

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Content

Monopolistic Competition

- Imperfect competition
- Differentiated products, highly substitutable but not perfect substitutes
- Free entry and exit
- $MR = MC < P$
- No economic profit in the long-run

Monopolistic Competition Cont'd

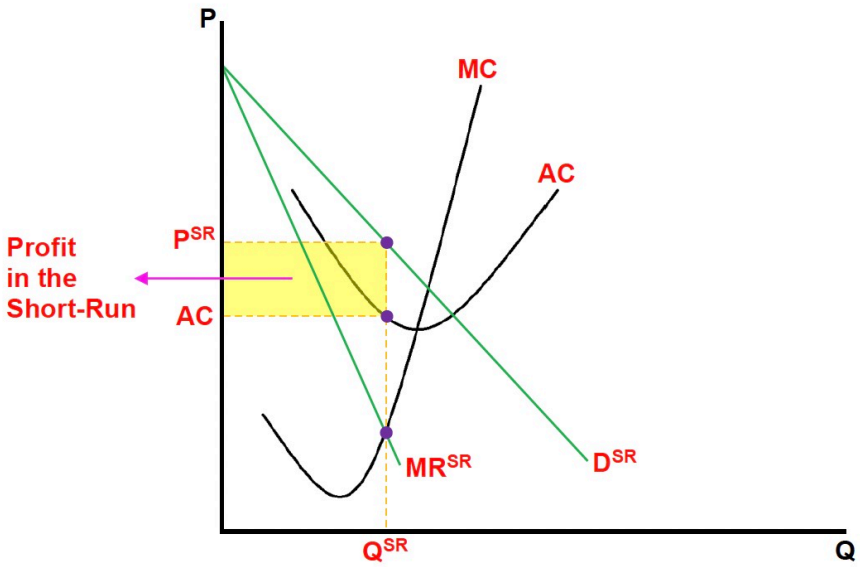
- Differentiated products by different firms: Firms are able to exert some control over the price they charge for their particular product
- The market is not a perfectly competitive one
- These firms are not monopolists

Monopolistic Competition Cont'd

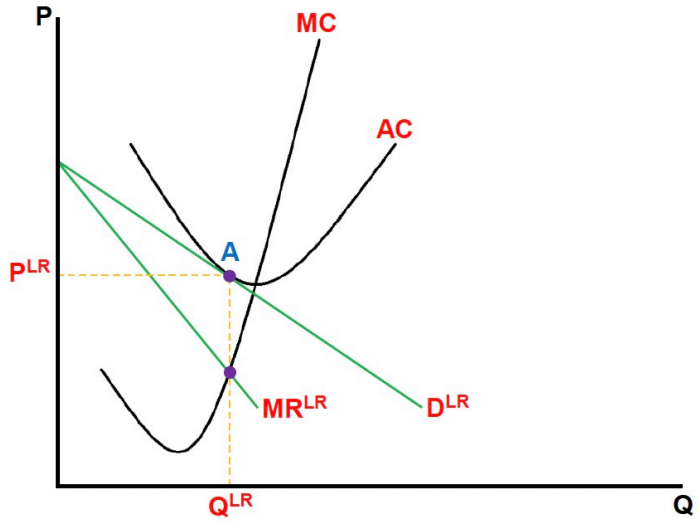
- Increasing returns to scale
  - The AC for a firm falls as more output is produced
  - Firms tend to specialize in the product lines that are most successful
  - By selling more of those products, the AC for the production falls

Monopolistic Competition Cont'd

- In the Short-Run



- In the Long-Run

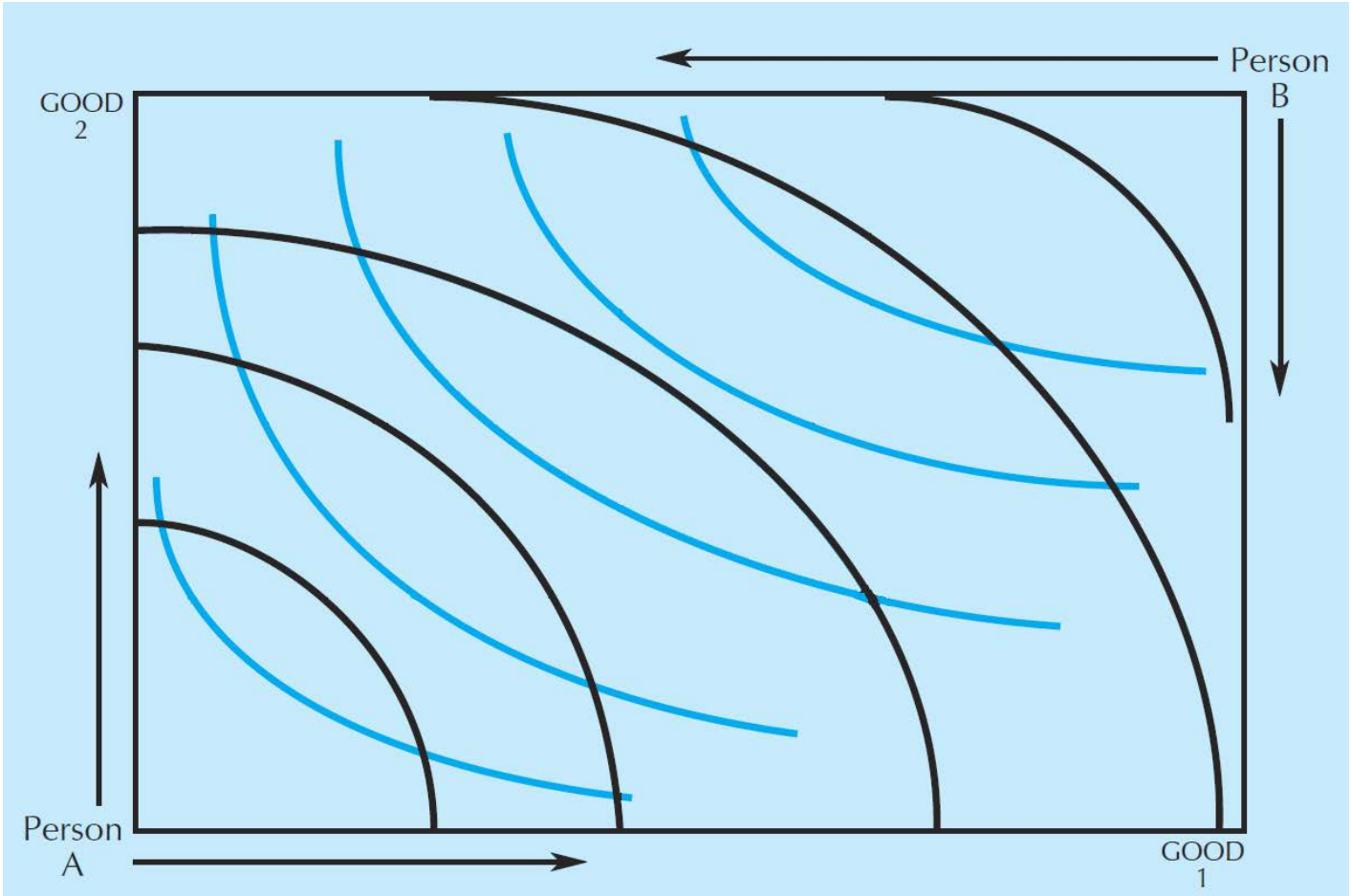


Pareto Efficiency

- Pareto Improvement
- Pareto Efficiency
- Pareto Inefficient

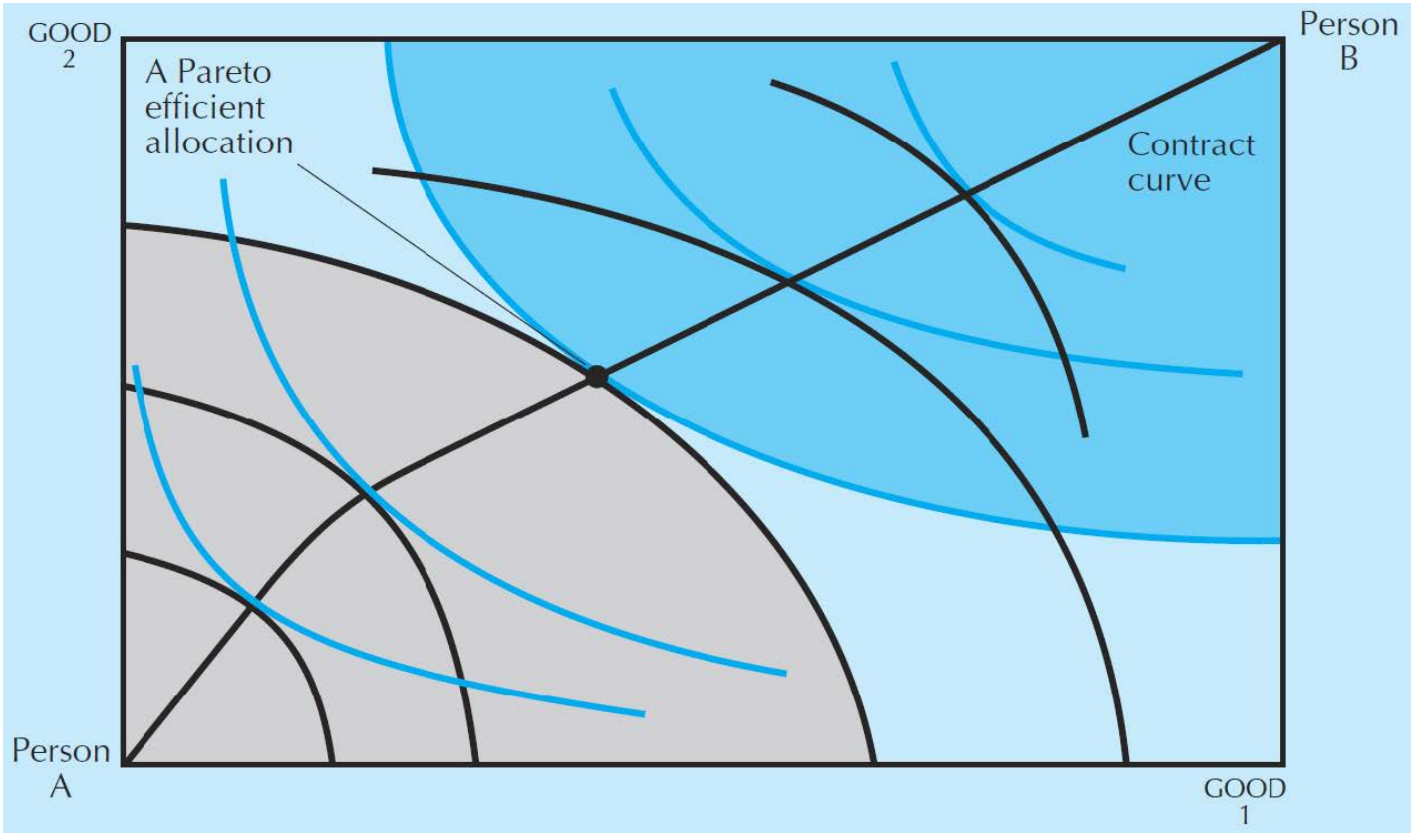
Pareto Efficiency Cont'd

- Pareto Efficient Allocation
- Edgeworth Box



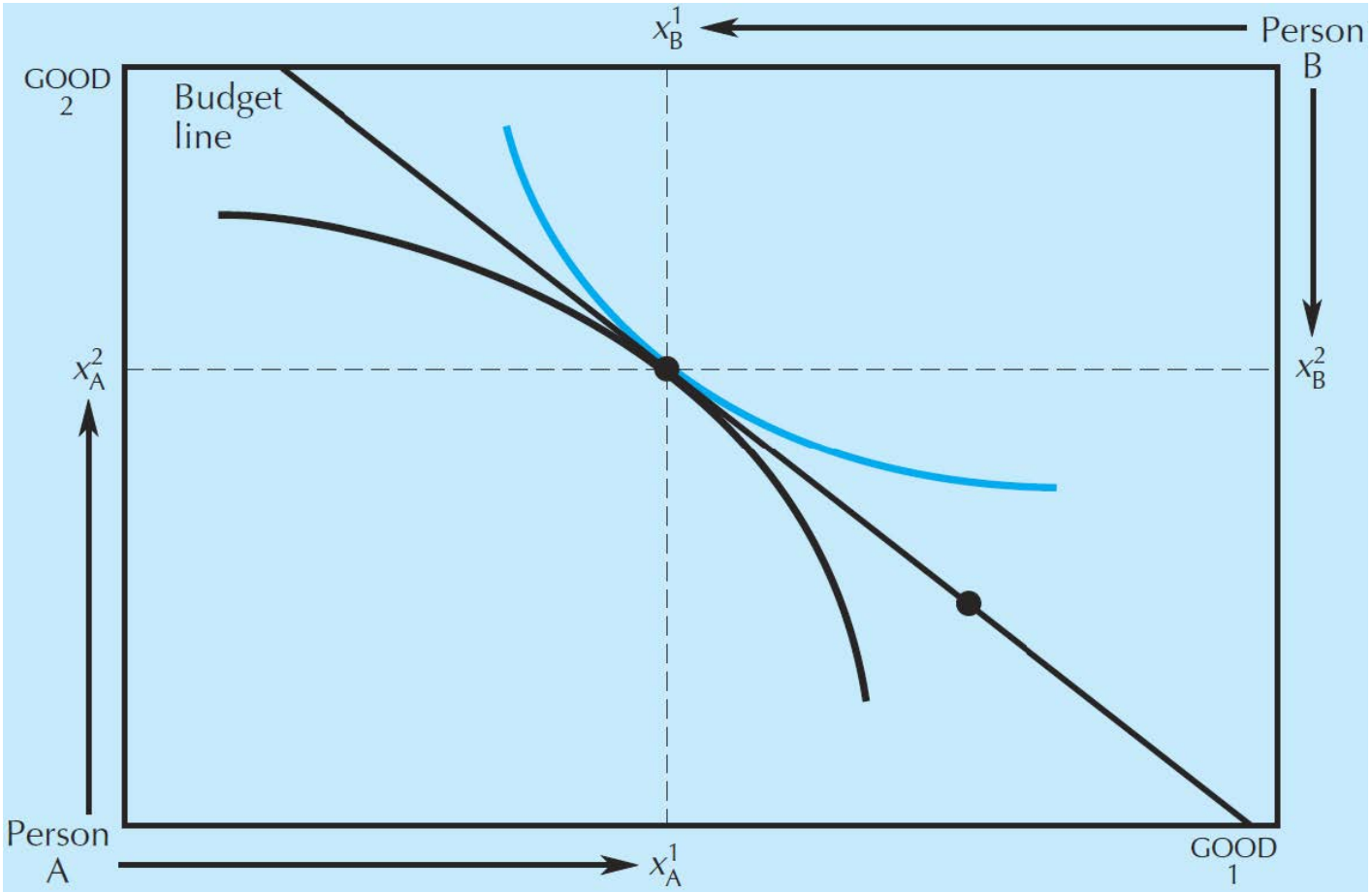
Pareto Efficiency Cont'd

- Contract Curve



Pareto Efficiency Cont'd

- Market Equilibrium

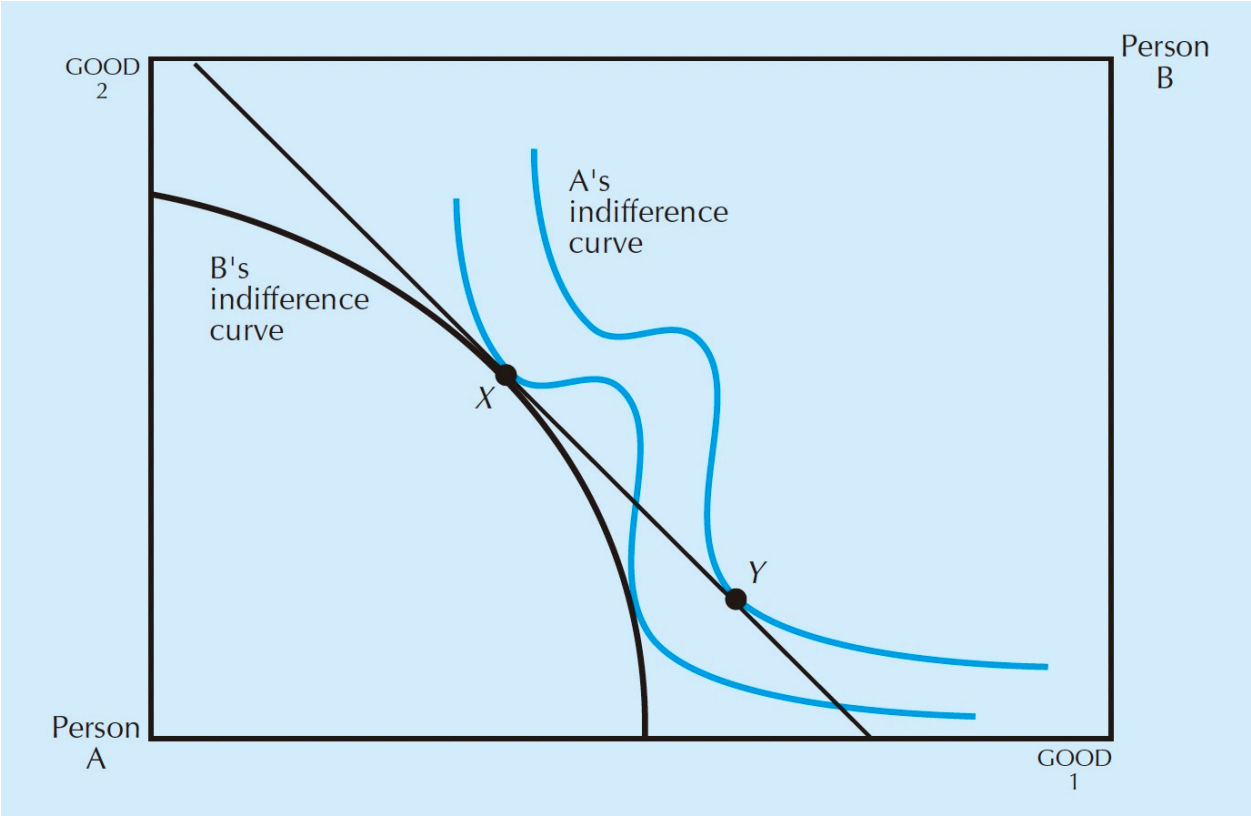


Pareto Efficiency Cont'd

- General Equilibrium
- Net demand: $\mathrm{e}_{\mathrm{i}}^{\mathrm{j}}\left(\mathrm{p}_1, \mathrm{p}_2\right)=\mathrm{x}_{\mathrm{i}}^{\mathrm{j}}\left(\mathrm{p}_1, \mathrm{p}_2\right)-\mathrm{w}_{\mathrm{i}}^{\mathrm{j}}, \mathrm{i}=\mathrm{A}, \mathrm{B} ; \mathrm{j}=1,2$
- Aggregate excess demand: $\mathrm{z}_{\mathrm{i}}\left(\mathrm{p}_1, \mathrm{p}_2\right)=\mathrm{e}_{\mathrm{A}}^{\mathrm{i}}\left(\mathrm{p}_1, \mathrm{p}_2\right)+\mathrm{e}_{\mathrm{B}}^{\mathrm{i}}\left(\mathrm{p}_1, \mathrm{p}_2\right)=\mathrm{x}_{\mathrm{A}}^{\mathrm{i}}\left(\mathrm{p}_1, \mathrm{p}_2\right)+\mathrm{x}_{\mathrm{B}}^{\mathrm{i}}\left(\mathrm{p}_1, \mathrm{p}_2\right)-\mathrm{w}_{\mathrm{A}}^{\mathrm{i}}-\mathrm{w}_{\mathrm{B}}^{\mathrm{i}}, \mathrm{i}=1,2$
- Walras' law: The value of aggregate excess demand is zero
- In general, if there are markets for k goods, only need to find a set of prices where $(k-1)$ of the markets are in equilibrium. Walras' law then implies that the market for Good k will automatically have demand equal to supply

Pareto Efficiency Cont'd

- The First Theorem of Welfare Economics: All market equilibria are Pareto efficient
- The Second Theorem of Welfare Economics: When preferences are convex, a Pareto efficient allocation is an equilibrium for some set of prices



Question 1

You are selling two goods, 1 and 2, to a market consisting of three consumers with reservation prices as follows

Consumer	For 1	For 2
A	20	40
B	30	60
C	40	80

The unit cost of each product is \$30.
a) Compute the optimal prices and profits for
(i) selling the goods separately,
(ii) bundling.
Which strategy would be most profitable? Why?

Question 1 Cont'd

Assume now that you are facing four consumers with the following reservation prices

Consumer	For 1	For 2
A	25	100
B	40	80
C	80	40
D	100	25

b) Compute the optimal prices and profits for
(i) selling the goods separately,
(ii) bundling.
Which strategy would be most profitable? Why?

Question 2

Consider a perfectly competitive pure exchange economy $\mathcal{E}$ with two agents (A and B). For each of the following scenarios, determine whether there is a Walrasian equilibrium with $\mathbf{p} \geq 0$. If so, find such an equilibrium $(\mathbf{p}; (\mathbf{x}^A, \mathbf{x}^B))$. If not, carefully explain why there is no equilibrium.
There are three goods (1, 2 and 3) and the agents' utility functions and initial endowments are as follows:

$$u^A(x_1, x_2, x_3) = 2\ln(x_1) + \ln(x_2) + \ln(x_3) \quad e^A = (10, 9, 0)$$
$$u^B(x_1, x_2, x_3) = \ln(x_1) + \ln(x_2) + 2\ln(x_3) \quad e^B = (0, 0, 24)$$

Question 3

Consider an exchange economy with two consumers (A and B) and two goods (x_1 and x_2). Consumer A has utility function $U^A(x_1^A, x_2^A) = (x_1^A)^{2/3}(x_2^A)^{1/3}$ and endowment $(\omega_1^A, \omega_2^A) = (30, 60)$. Consumer B has utility function $U^B(x_1^B, x_2^B) = (x_1^B)^{1/3}(x_2^B)^{2/3}$ and endowment $(\omega_1^B, \omega_2^B) = (60, 30)$.

a) Is the initial endowment Pareto efficient? Explain.

b) Express the equation for the contract curve in terms of x_1^A and x_2^A.

c) Let good 2 be the numeraire. $p_2 = 1$. Find the competitive equilibrium price of good 1, p_1.

d) What are the equilibrium consumption bundles for A and B?

Question 4

If the market demand is $P = 100 - 0.5(q_1 + q_2), c_1 = 5g_1, c_2 = 0.5g_2^2$, find Cournot equilibrium, and find π_1 and π_2 accordingly.
(Hint: q: demand, g: supply.)

Question 5

The market inverse demand function is $p = 60 - y_T$. The firms' cost functions are $c_1(y_1) = y_1^2$ and $c_2(y_2) = 15y_2 + y_2^2$.
a) Firm 2 is the follower. What is its reaction function?
b) What is the leader's profit function?

Question 6

Consider a market for electric vehicles with demand given by $D(p) = 100 - p$. Xiaoniu is a producer in this market, facing a cost function given by $c(y) = 20y$.

a) Suppose Xiaoniu is only supplier in the market. If Xiaoniu performs first-degree price discrimination, how many vehicles will be produced? What will be the producer's surplus? Briefly explain what the deadweight loss will be.

b) Suppose in addition to Xiaoniu, another firm, Aima, also produces electric vehicles. The cost function for Aima is given by $c(y) = 30y$. If Xiaoniu and Aima simultaneously set output levels, how many vehicles will be produced by each firm in equilibrium? What is the equilibrium price?

Question 6 Cont'd

c) Suppose in addition to Xiaoniu, another firm, Aima, also produces electric vehicles. The cost function for Aima is given by $c(y) = 30y$. Xiaoniu is the market leader and set its output level first. Aima set it own output level after observing Xiaoniu' output level. How many vehicles will be produced by each firm in equilibrium? What is the equilibrium price?
d) Suppose in addition to Xiaoniu, two other firms, Aima and Lamborghini, also produce electric vehicles. The cost functions for Aima and Lamborghini are both given by $c(y) = y^2 + 20y$. Xiaoniu is the price leader in the electric vehicle industry. The other firms take the price set by Xiaoniu as given. What is the residual demand function for Xiaoniu? How many vehicles will be produced by each firm in equilibrium? What is the equilibrium price?

Q&A

Thanks!