Practice Problem Set 3

Monopoly (C.25), Oligopoly (C.28)

Question 3.1

Massive Dynamic is a monopoly that sells a special drug that enhances brainpower to two markets: Pulau North and Pulau South. The demand for the drug in the two markets are given by $P_N = 15 - Q_N$ and $P_S = 25 - Q_S$ respectively. Massive Dynamic's (total) cost function is given by $C = 5 + 3Q$, where $Q = Q_N + Q_S$.

i) Suppose Massive Dynamic can sell its product in Pulau North and Pulau South at different prices, what will these prices be? What are the equilibrium quantities sold?

ii) Suppose the government passes a law that forbids Massive Dynamic from charging consumers in Pulau North and Pulau South different prices, what are the new equilibrium prices and quantities sold?

iii) Does the regulation increase or decrease Massive Dynamic's profit?

Question 3.2

Gerald is the sole owner of a mineral water spring. It costs Gerald \$2 per litre to bottle mineral water from the spring. The inverse demand curve for Gerald's mineral water is $p = \$20 - 0.2q$, where p is the price per litre and q is the number of litres sold.

i) Write down an expression for profits as a function of q. Find the profit-maximizing choice of q for Gerald.

ii) What price does Gerald set (per litre of mineral water) if he produces the profit-maximizing quantity? How much profit does he make?

iii) Suppose, now, that Gerald's neighbor, Brandy finds a mineral spring that produces mineral water that is just as good as Gerald's water, but that it costs Brandy \$6 (per litre) to get water out of the ground and bottle it. Total market demand for mineral water remains as before. Suppose that Gerald and Brandy each treats the other's quantity decision as given. What is the equilibrium output for Brandy? What is the equilibrium price?

Question 3.3

Ben&Jerry's and Haagen Dazs are duopolists in the market for ice cream. They face a downward-sloping market linear demand curve. Each firm has an identical marginal cost that is independent of output. The two firms engage in Cournot competition. Indicate how the following will affect Ben&Jerry's and Haagen Dazs' reaction functions, and the equilibrium quantities produced. Explain briefly.

i) Doctors begin to recommend that all students should eat ice cream regularly.

ii) A main ingredient of Ben&Jerry's and Haagen Dazs' ice cream is sugar. The price of sugar goes up.

iii) Ben&Jerry's total fixed cost increases (but it is still profitable to produce).