ECO 6122/6522: Microeconomic Theory IV/Théorie microéconomique IV

Economics Department/Département de science économique University of Ottawa/Université d'Ottawa

Cournot-Nash Equilibrium with n firms

Assume the following market setting: (same notation as in class)

- market with n identical firms
- homogeneous product
- firms compete in quantities: $q_i \in (0, \infty)$
- simultaneous choices
- price is such that all output get sold: $D(p) = \sum_{i} q_i \equiv Q$
- inverse demand function is p = a bQ
- Constant and identical marginal cost: $TC_i = cq_i$
- 1. Determine the Cournot-Nash (symmetric) equilibrium values of output quantities, price and profits as a function of n. Is it efficient?
- 2. What is the price when n = 1? Comment.
- 3. What happens to the price when $n \to \infty$? Comment.

Hint: Proposed solution strategy: Solve for the problem of firm 1 while keeping $Q_{-1} \equiv \sum_{i=2}^{n} q_i$ fixed. Assume thereafter that $q_1 = q_2 = \ldots = q_n = q$.