

Homework # 9 - [Due on December 3rd, 2018]

1. Consider a monopolist with cost function $C(q) = cq$, where $c > 0$ denotes its constant marginal production cost. The monopolist faces an inverse demand curve $p(q)$, which is strictly decreasing in output, $p'(q) < 0$, whose vertical intercept $p(0)$ satisfies $p(0) > c$.
 - (a) Set up the monopolist profit-maximization problem and find its first-order condition. Interpret.
 - (b) How is monopoly price affected by a marginal increase in marginal cost c when the inverse demand function is: (i) strictly concave; (ii) strictly convex; and (iii) linear?

2. Consider a monopolist facing inverse demand function $p(q) = 1 - q$; a supply function of $q = ax$, where x denotes the number of input that the monopolist hires (e.g., labor) and $a > 0$; and cost function $C(x) = bx + dx^2$, where $b, d > 0$, thus being increasing and convex in input units x .
 - (a) Write down the monopolist's profit-maximization problem. Find the equilibrium values of the monopolist's input decision, and its output level.
 - (b) Assume now that the firm operates in a perfectly competitive industry, where price equals marginal cost. Find in this context the equilibrium values of the monopolist's input decision, and its output level.