

Collegio Carlo Alberto

Economic Principles Problem Set 6

1. Suppose that the technology for producing q is identical for all firms. The cost function for a representative firm is given by

$$c(q) = a + bq + cq^2,$$

where $a > 0$, $b > 0$, and $c > 0$. Find the long run equilibrium price, and the quantity of output produced by each firm.

2. Consider an industry with 7 identical competitive firms. The production function of a representative firm is

$$q = \min \{ \sqrt{x_1}, \sqrt{x_2} \},$$

where x_1 and x_2 are the inputs that the firm uses to produce output q . Suppose that the input prices are $w_1 = 4$ and $w_2 = 3$.

The demand function is $q^D(p) = 48 - p$. Find the short run equilibrium price and quantity. Compute the profits of each firm.

3. Consider an industry with identical firms and production function

$$y = \sqrt{(x_1)^2 + (x_2)^2}.$$

The demand function is $q^D(p) = a - bp$, where $a > 0$, $b > 0$. Compute the long run equilibrium number of firms in the market, and the quantity of output that each firm produces.

4. The demand curve for a good is $q^D(p) = 100 - p$, and the supply is $q^S(p) = 20 + 3p$. Compute the equilibrium price and quantity.

Suppose that the government need to collect revenues for 308. The government can choose between a per unit tax t on production and a per unit tax \tilde{t} on consumption. Find the values of t and \tilde{t} . If the government wants to minimize the dead weight loss, which tax should it choose?