Problem set 1

PPHA 32400 Microeconomics and Public Policy II

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1. Consider a profit-maximizing firm with a marginal cost function given by MC(q) = 10 + q. It is a perfectly competitive firm i.e. it is a price-taker. The market price is p.

a) Consider a situation where the firm is already in the market. What is the optimal quantity to produce? (Hint: the optimal quantity will be a function of p

Given that $p = MC(q)$, we

$$p = 10 + q$$

$$q = p - 10$$

But since $q^* \geq 0$, in our case, because $p \leq 10$, then the optimal quantity is:

$$q* = 0$$

b) Consider a situation where the firm is already in the market. Depict the marginal cost curve graphically, with the quantity produced on the x-axis and the prices/costs on the y-axis. Label the intercepts, as well as the optimal quantity. Label the producer surplus.

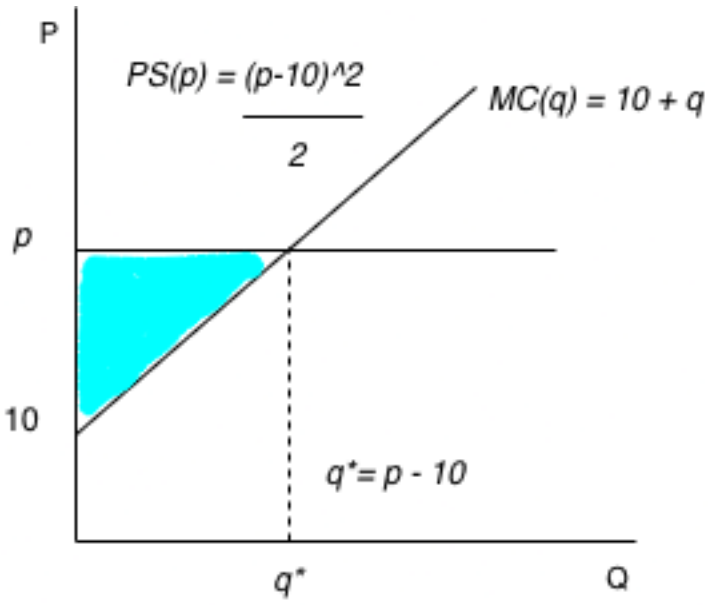

Figure 1: Graph for MC(q)

c) Consider a situation where the the firm is deciding whether to enter the market or not. Suppose that the fixed cost is FC = 50. What is the price below which the firm will not enter the market.

Considering our PS from before:

$$PS(p) = \frac{(p-10)^2}{2}$$

Then:

$$\pi(p) = \frac{(p-10)^2}{2} - 50$$

Setting $\pi(p) = 0$, we have:

$$\frac{(p-10)^2}{2} - 50 = 0$$
$$(p-10)^2 = 100$$
$$p - 10 = 10$$
$$p = 20$$

So the firm will not enter the market if the price is below 20.