

# PRACTICE 10 - MICROECONOMICS

Bachelor Degree in Global Governance

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## EXERCISE

In a perfectly competitive market, there are 50 firms operating, each one has the following total cost function:

$$TC(Q_i) = Q_i^2 + 25$$

The market is also characterized by the following demand function

$$Q^d = 500 - 25p$$

Compute:

1. The short run supply curve of the firm
2. The short run supply curve of the industry
3. Price and Quantity at the equilibrium
4. The level of production and the profit realized by one firm in the short run

## SOLUTIONS

- $Q_i = \frac{1}{2}p$
- $Q^s = 25p$
- $p^* = 10, Q^* = 250$
- $Q_i = 5, \pi^{SR} = 0$

## EXERCISE

In a perfectly competitive market, there are 40 firms operating, each one has the following total cost function:

$$TC(Q_i) = Q_i^2$$

The market is also characterized by the following demand function

$$Q^d = 40 - 4p$$

Compute:

1. The short run supply curve of the firm
2. The short run supply curve of the industry
3. Price and Quantity at the equilibrium
4. The level of production and the profit realized by one firm in the short run

## SOLUTIONS

- $Q_i = \frac{1}{2}p$
- $Q^s = 20p$
- $p^* = 1.7, Q^* = 34$
- $Q_i = 0.85, \pi^{SR} = 0.72$

## EXERCISE

In a perfectly competitive market, there are 10 firms operating, each one has the following total cost function:

$$TC(Q_i) = Q_i^2$$

The market is also characterized by the following demand function

$$Q^d = 10 - \frac{1}{5}p$$

Compute:

1. The short run supply curve of the firm
2. The short run supply curve of the industry
3. Price and Quantity at the equilibrium
4. The level of production and the profit realized by one firm in the short run

## SOLUTIONS

- $Q_i = \frac{1}{2}p$
- $Q^s = 5p$
- $p^* = 1.92, Q^* = 9.6$
- $Q_i = 0.96, \pi^{SR} = 0.92$

## EXERCISE

In a perfectly competitive market, there are 60 firms operating, each one has the following total cost function:

$$TC(Q_i) = Q_i^2 + 30$$

The market is also characterized by the following demand function

$$Q^d = 500 - 15p$$

Compute:

1. The equilibrium price and quantity in the long run for the single firm
2. The equilibrium quantity in the whole industry
3. The number of firms operating in the long run
4. The long-run profit incurred by each firm in the case where the size of plants is not free to vary



## SOLUTIONS

- $Q_i = \sqrt{30}, p = 10.95$
- $Q^d = 335.75$
- $n = 61$
- $\pi^{LR} = 0$

## EXERCISE

In a perfectly competitive market, there are 50 firms operating, each one has the following total cost function:

$$TC(Q_i) = Q_i^2 + 40$$

The market is also characterized by the following demand function

$$Q^d = 600 - 20p$$

Compute:

1. The equilibrium price and quantity in the long run for the single firm
2. The equilibrium quantity in the whole industry
3. The number of firms operating in the long run
4. The long-run profit incurred by each firm in the case where the size of plants is not free to vary

## SOLUTIONS

- $Q_i = \sqrt{40}, p = 12.65$
- $Q^d = 347$
- $n = 55$
- $\pi^{LR} = 0$

## EXERCISE

In a market there is only one firm operating with the following total cost function:

$$TC(Q_i) = 20Q_i$$

The market demand is given by :

$$Q^d = 100 - p$$

Compute:

1. Market equilibrium when the firm is price-setter (it behaves as a monopoly)
2. Monopoly mark-up and profit
3. Market equilibrium when the firm is price-taker (it behaves as in perfect competition)
4. Monopoly net gain

## SOLUTIONS

- $Q^m = 40, p^m = 60$
- $\mu = 200\%, \pi^m = 1600$
- $p^{PC} = 20, Q^{PC} = 80$
- $\pi^m - \pi^{PC} = 1600$

## EXERCISE

In a market there is only one firm operating with the following total cost function:

$$TC(Q_i) = Q_i^2 + 100$$

The market demand is given by :

$$Q^d = 120 - p$$

Compute:

1. Market equilibrium when the firm is price-setter (it behaves as a monopoly)
2. Monopoly mark-up and profit
3. Market equilibrium when the firm is price-taker (it behaves as in perfect competition)
4. Monopoly net gain

## SOLUTIONS

- $Q^m = 30, p^m = 90$
- $\mu = 50\%, \pi^m = 1700$
- $p^{CP} = 80, Q^{CP} = 40$
- $\pi^m - \pi^{PC} = 200$