

Answer on Question #71629, Economics / Microeconomics

Use the following market demand and supply equations to answer questions a and b $Q_d = 100 - P$, and $Q_s = 10 + 2P$ and $ATC = 0.5Q$

a) Calculate the competitive market's profit-maximizing price, quantity, and profit.

Answer:

a)

If the demand function is $Q_d = 100 - P$ and the supply function is $Q_s = 10 + 2P$

set

$$100 - P = 10 + 2P$$

and solve for P

$$90 = 3P$$

$$P = 30$$

Therefore the price is 30.

To solve the quantity, substitute 30 for P in either the demand function or the supply function.

$$100 - P = 100 - 30 = 70$$

$$10 + 2P = 10 + 2(30) = 10 + 60 = 70$$

Therefore the **profit maximization** quantity is 70.

Then the total revenue, which is (P x Q)

$$TR = 30Q$$

To find total Costs

$$\text{Average Costs} = \text{Total Costs} / Q$$

$$\text{Total Costs} = \text{Average Costs} \times Q = 0.5Q \times Q = 0.5Q^2$$

To find to the profit

$$\text{Profit} = TR - TC$$

$$\text{Profit} = 30Q - 0.5Q^2$$

$$\text{Profit} = 30 \times 70 - 0.5 \times 70^2$$

$$\text{Profit} = 2100 - 2450$$

$$\text{Profit} = 350$$

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