ECONOMICS 1 (sem 2)

Tutorial 4

Diego Battiston
https://diegobattiston.github.io

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Questions to cover today

- Q25
- Q26
- Q28
- Q31
- Q13
- Q12
- Q33

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Monopoly Decision

$$Profits = Revenues - TC(Q)$$

To Maximize Profits, FOC:

$$\boxed{MR = MC}$$

- What is MR in perfect competition?
- For a monopoly, MR changes depending on Q

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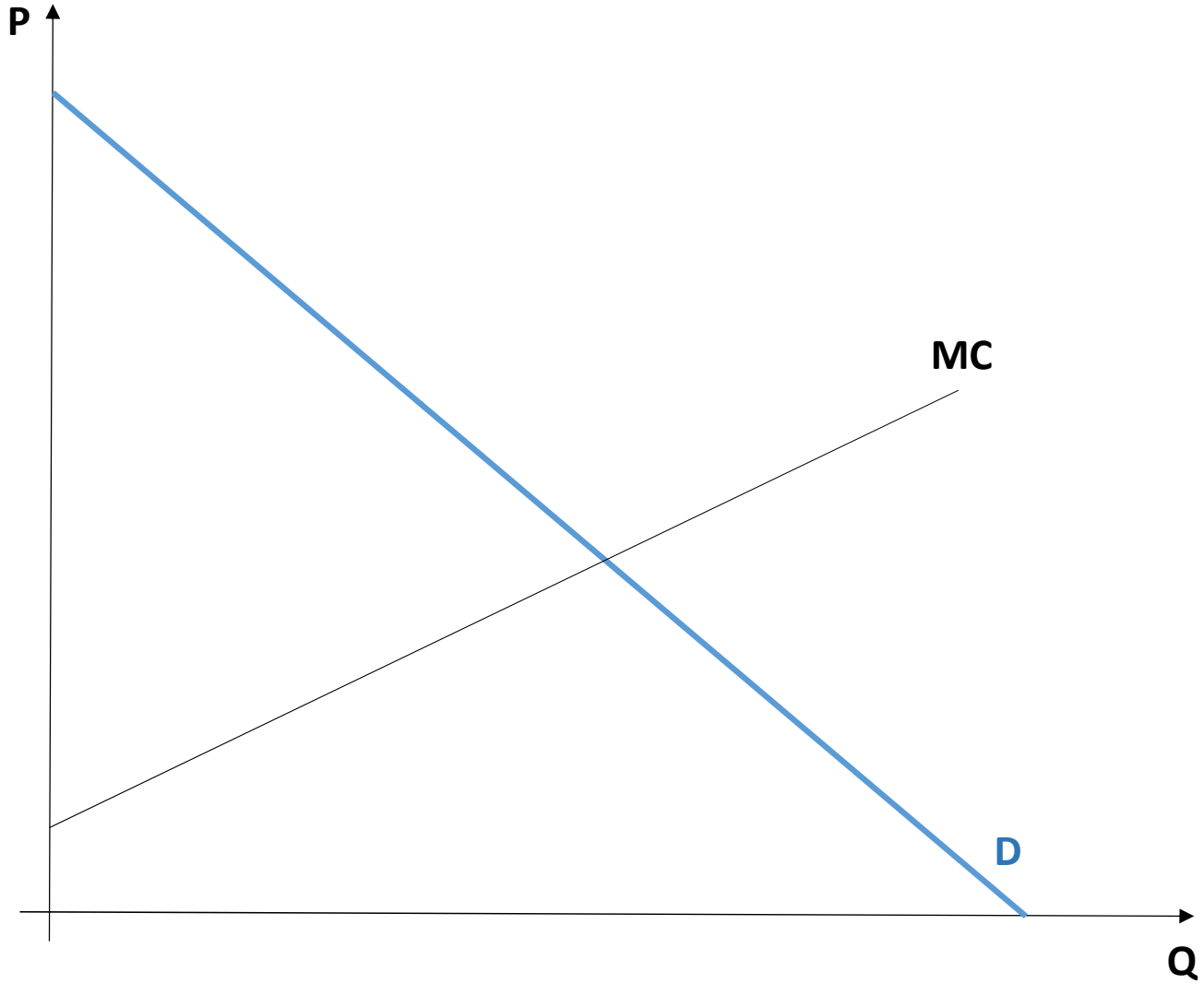
Monopoly Decision: Graphically



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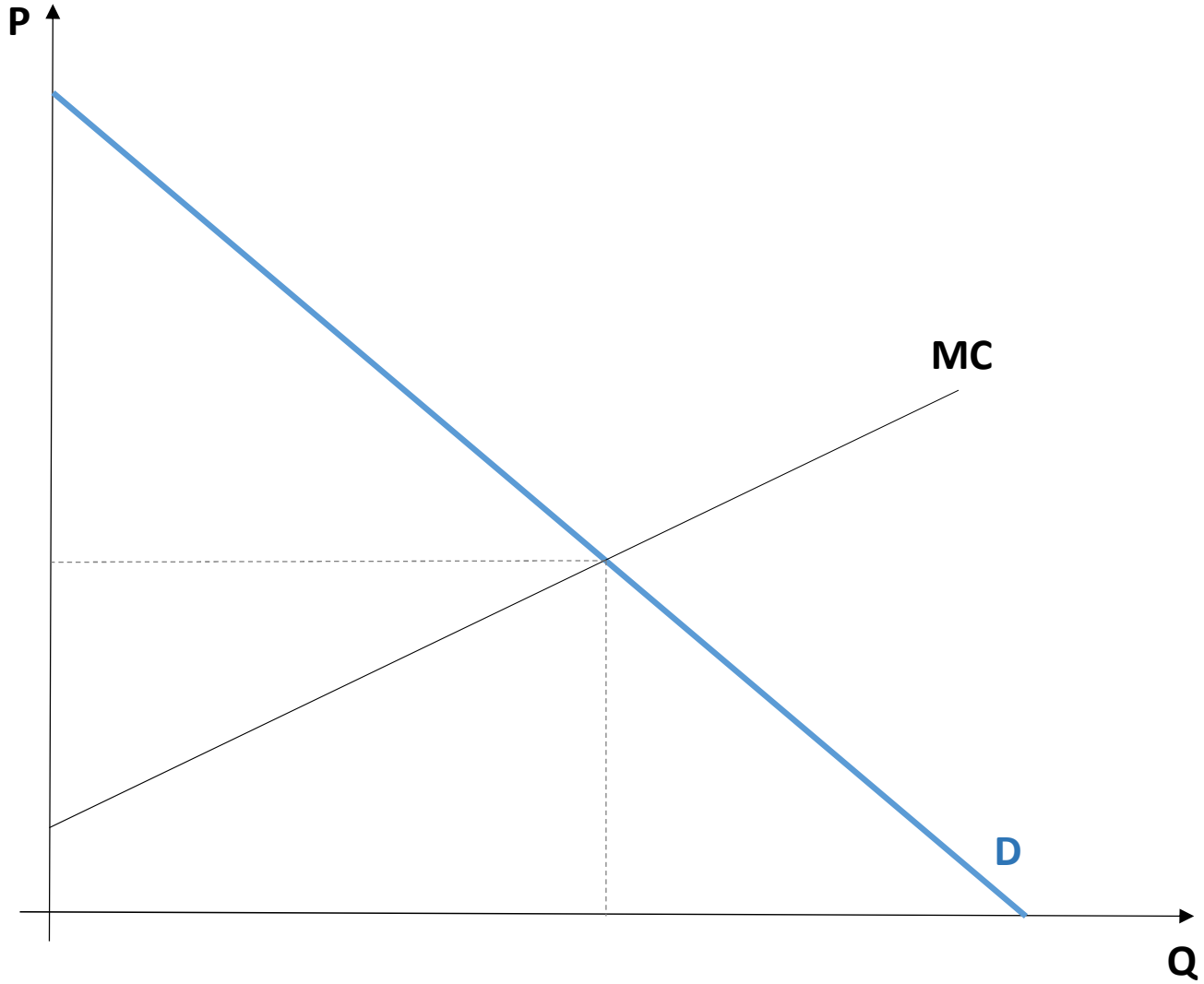
DWL of Monopoly



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Q25. Suppose that Omni Consumer Products (OCP) is a monopolist facing a demand curve given by $P = 100 - Q$ and a total cost curve given by $TC = 16 + Q^2$. The associated marginal cost curve is $MC = 2Q$. Find OCP's profit-maximizing quantity and price. How much economic profit will the monopolist earn?

$$MR = MC$$

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Q26. Now suppose OCP (our previous monopolist) has a total cost curve given by $TC = 32 + Q^2$. The corresponding marginal cost curve is still $MC = 2Q$, but fixed costs have doubled. Find the monopolist's profit-maximizing quantity and price. How much economic profit does the monopolist earn?

(Question 10 is similar to this)

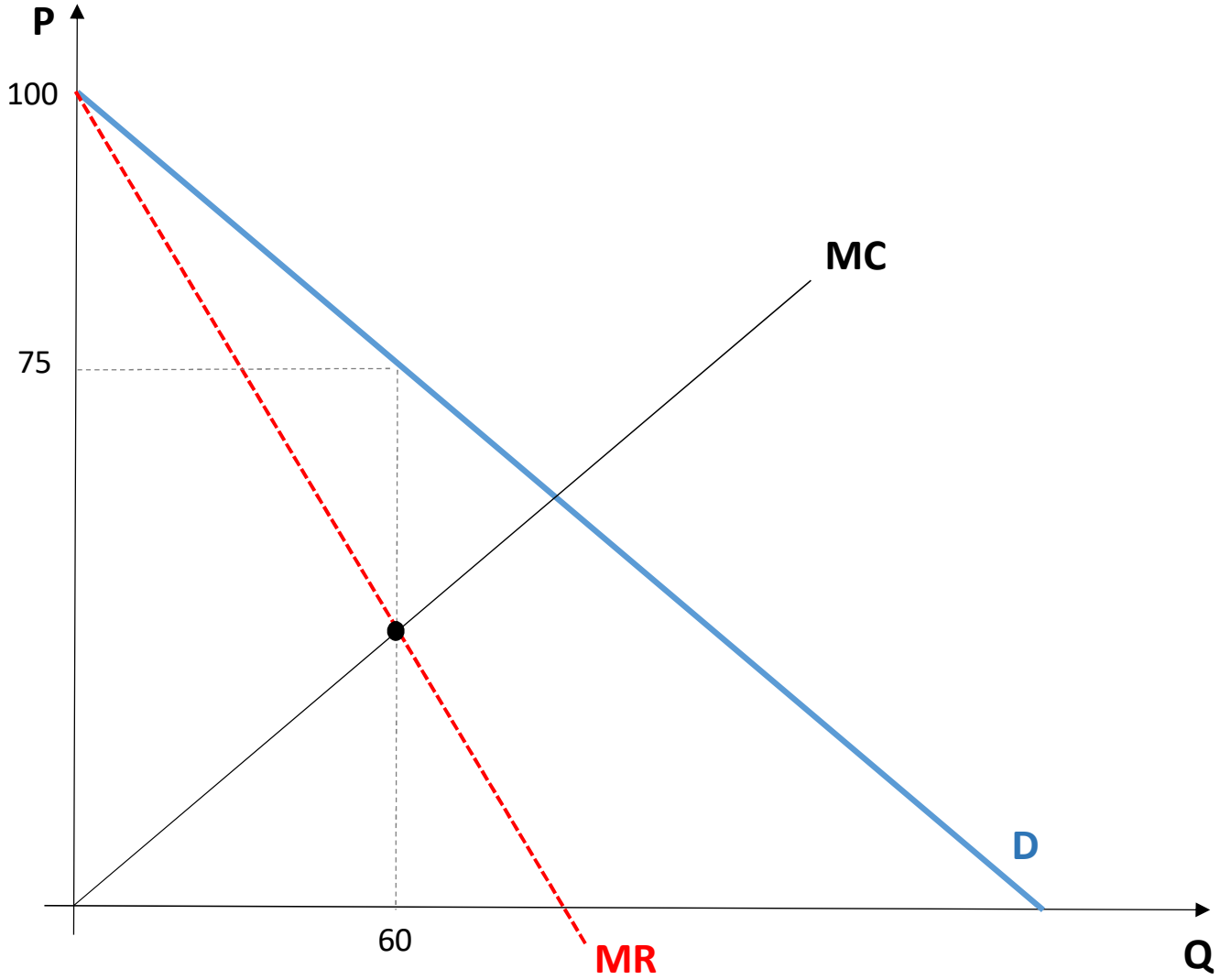
$Q = ?$

$P = ?$

Q28. Now suppose OCP also has access to a foreign market in which they can sell whatever quantity they choose at a constant price of 60. How much will they sell in the foreign market? What will their new quantity and price be in the original market?

The monopolist **should never** sell at a price **less than 60** in the internal market as it can sell every unit for 60 in the external market

Initial monopoly situation



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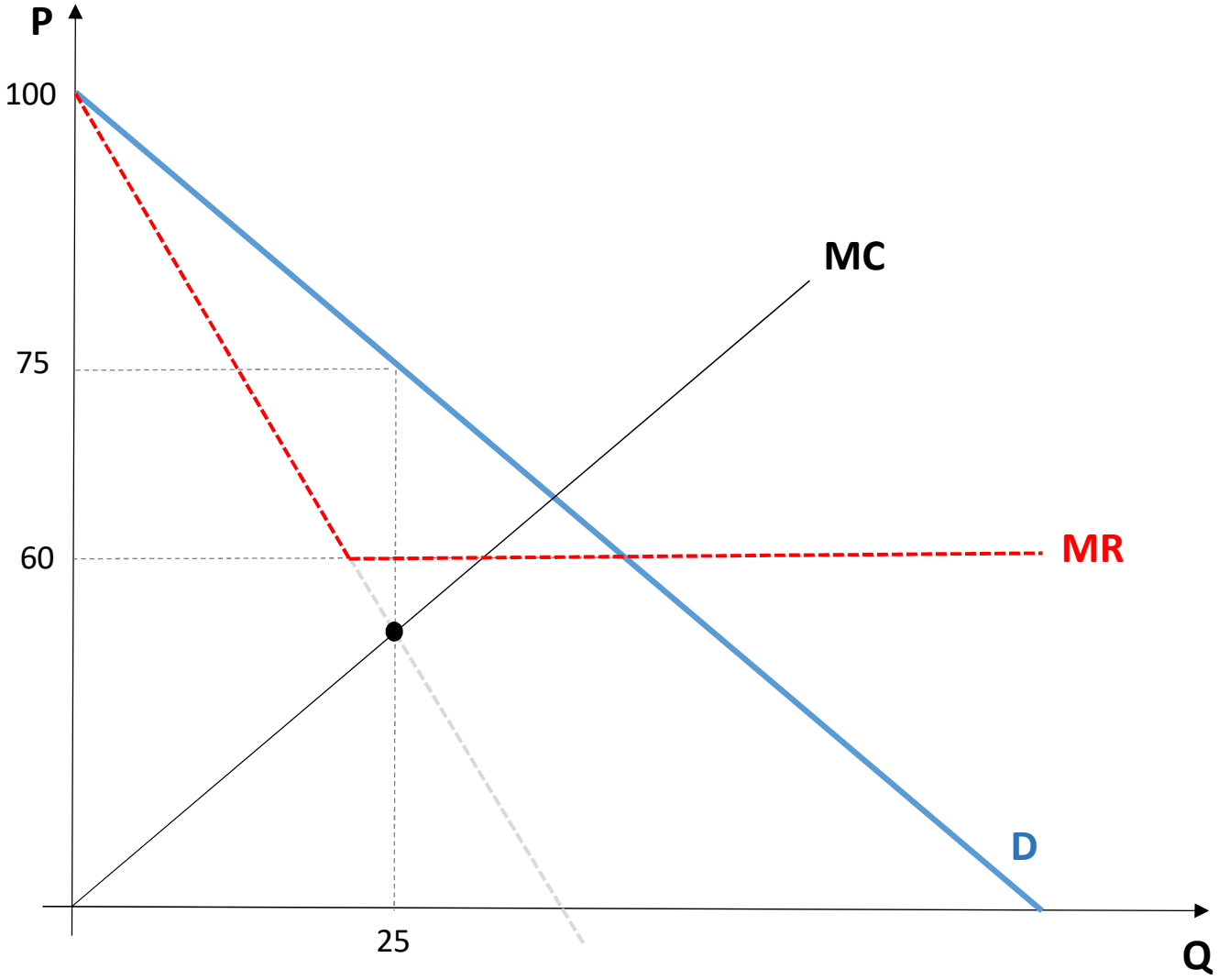
Now: MR become flat at P=60



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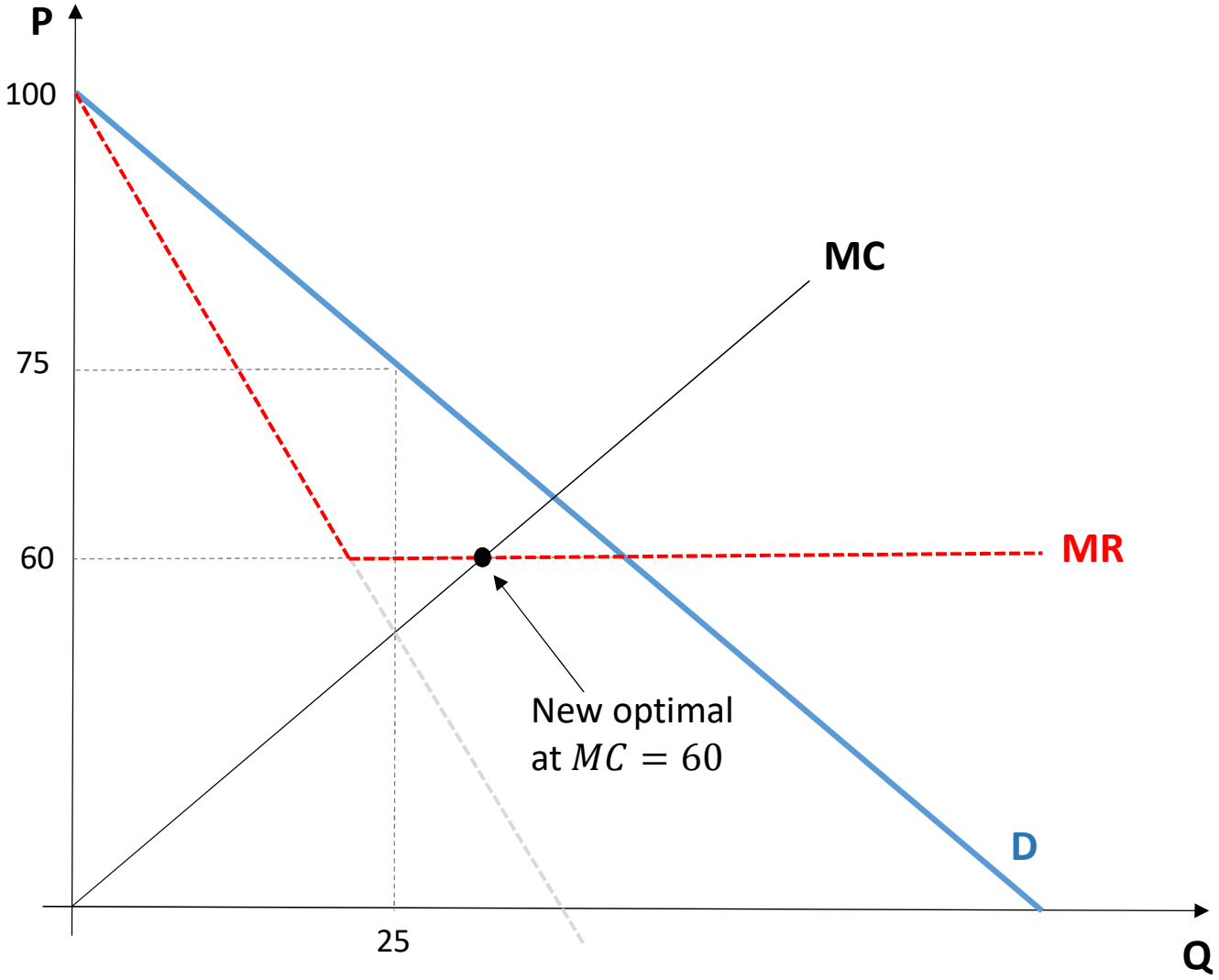

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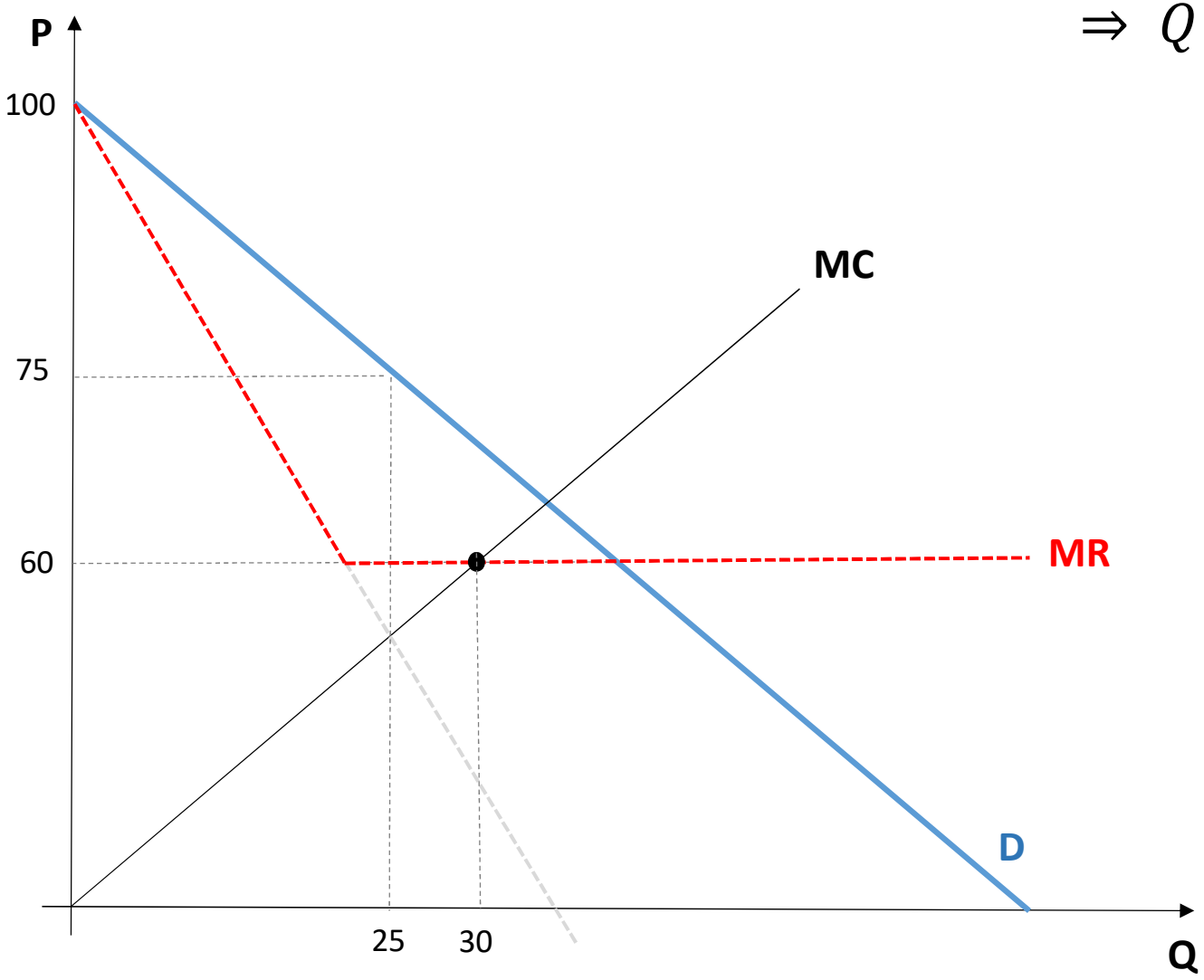
$$MC = 2Q = 60$$

$$\Rightarrow \; Q = 30$$



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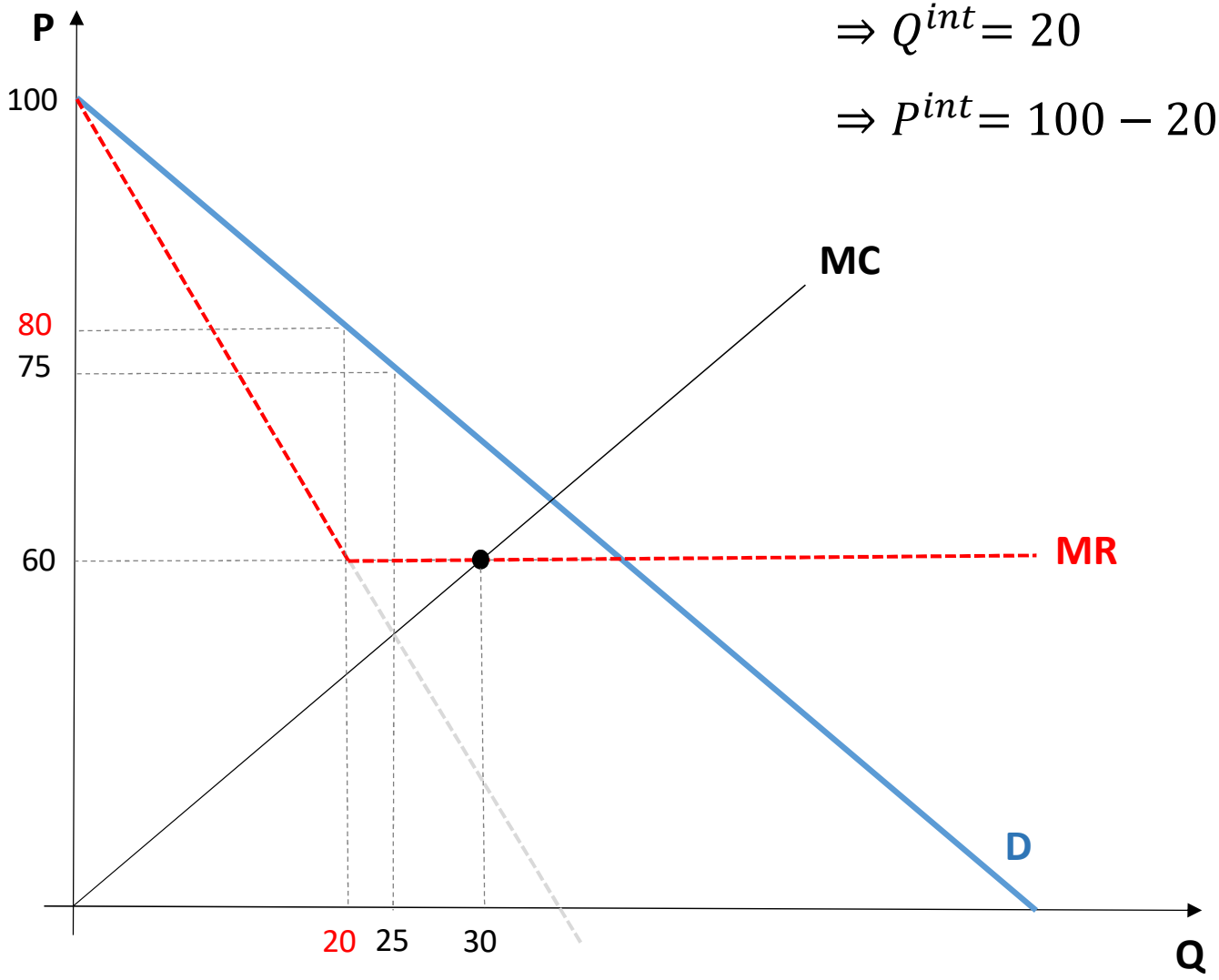
In the internal market, sell units until MR = 60

$$MR^{int} = 100 - 2Q^{int} = 60$$

$$\Rightarrow Q^{int} = 20$$

$$\Rightarrow P^{int} = 100 - 20 = 80$$



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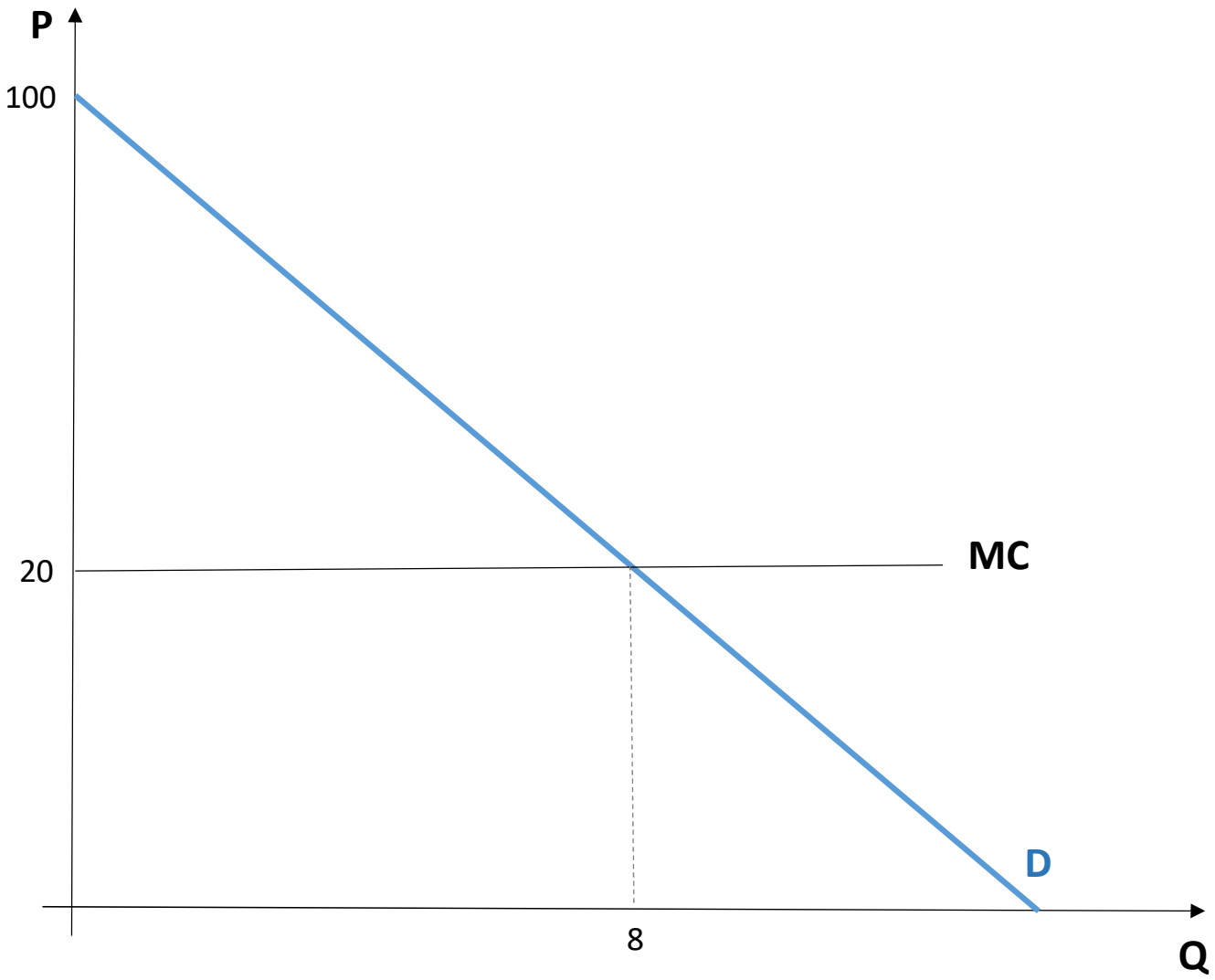
Q31. Suppose a perfectly discriminating monopolist faces market demand P=100-10Q and has constant marginal cost MC=20 (with no fixed costs). How much does the monopolist sell? How much profit does the monopolist earn? What is the maximum per-period license fee the government could charge the firm and have the firm still stay in business?

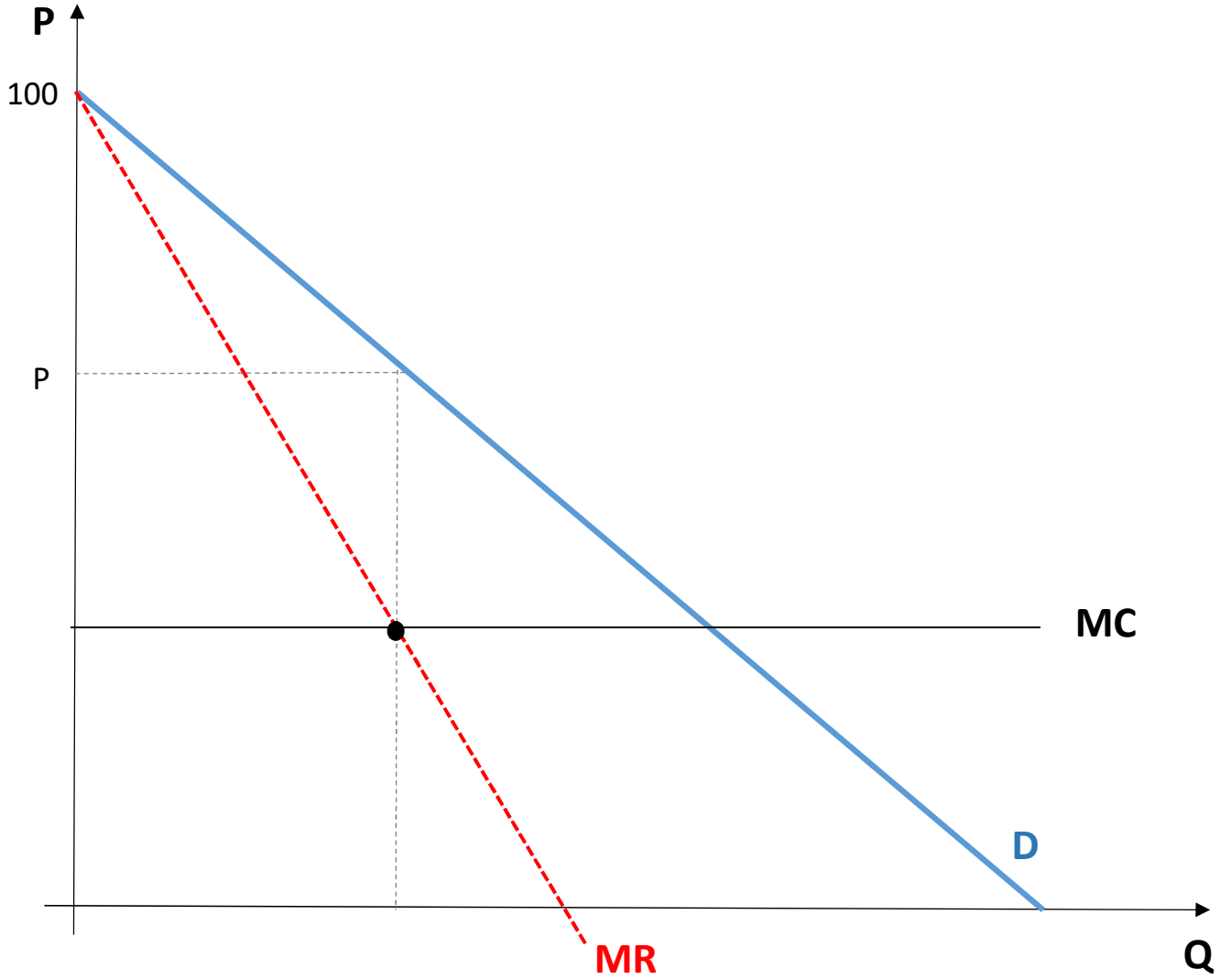
Perfect discrimination



Q12. A monopolist is operating at an output level where the elasticity of demand is given by $\epsilon = -1.5$. The government now imposes a quantity tax of £2 per unit of output. If the demand curve facing the monopolist is linear, how much does the price rise?

Solve it assuming MC is constant, otherwise it is more complicated

Before tax



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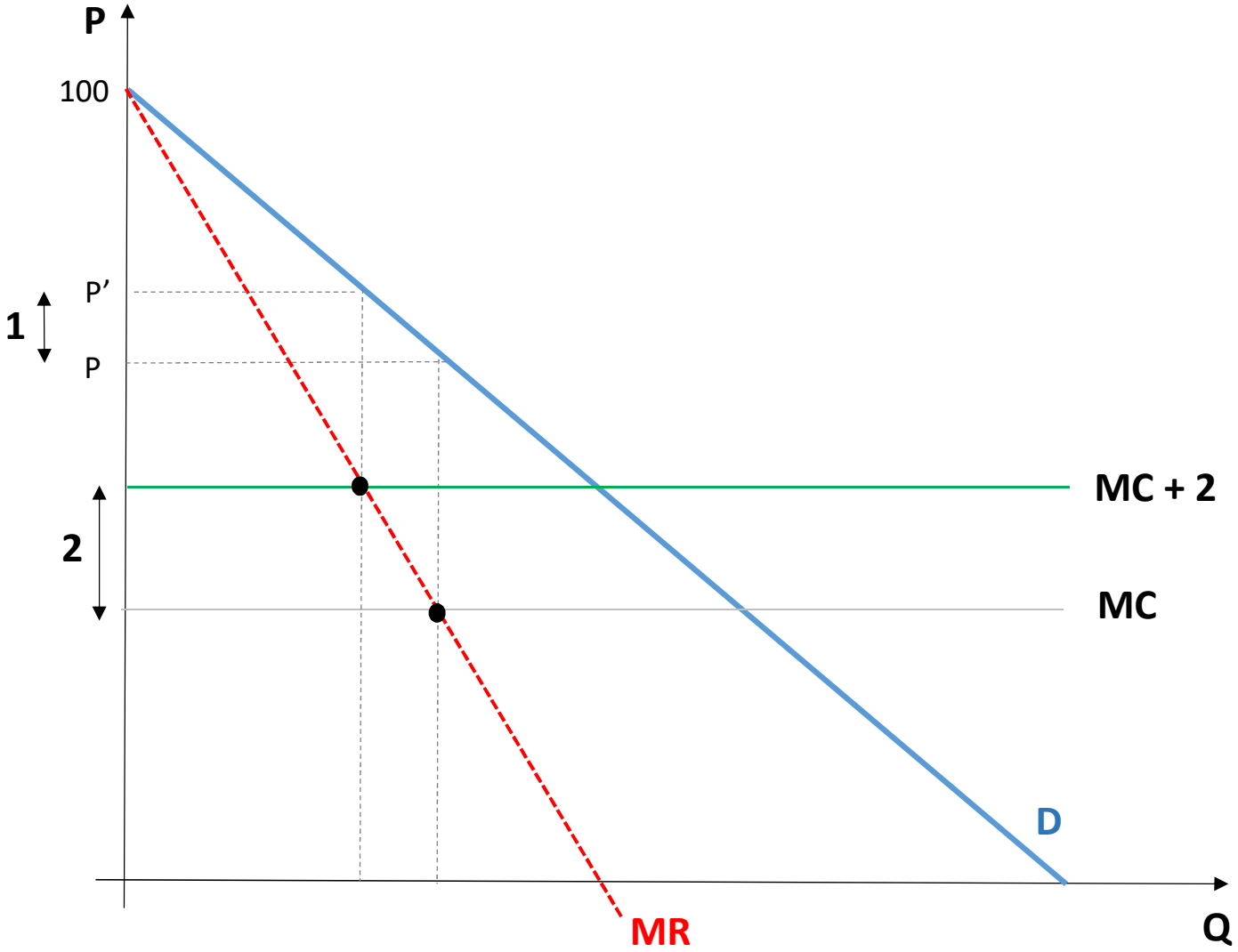
After tax



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Q13. A monopolist is operating at an output level where the elasticity of demand is given by $\epsilon = -1.5$ The government now imposes a quantity tax of £2 per unit of output. If the demand curve facing the monopolist is a constant elasticity of demand function (so that the elasticity is always equal to -1.5), how much does the price rise?

Mark-up formula for monopoly: $P = \frac{MC}{\frac{1}{\epsilon}+1}$

Then, $\Delta P = \frac{1}{\frac{1}{\epsilon}+1}\Delta MC$

In this case: $\Delta P = \frac{1}{\frac{1}{-1.5}+1}2 = 6$

Derivation of Mark-Up formula

Q33. Acme Corporation is a monopolist with a total cost curve given by $TC = 5Q + 15$. Acme sets two prices for their product: a regular price, P_H, and a discount price, P_L. Everyone is eligible to purchase the product at P_H. To be eligible to buy at P_L, it is necessary to fill in some paperwork demonstrating that the buyer is in relatively poor financial circumstances. Suppose the only buyers who present the paperwork are those who would not have been willing to buy the product at P_H.

a) If Acme's demand curve is given by $P = 20 - 5Q$, what are the profit-maximizing values of P_H and P_L?

How to approach this exercise

- Useful to think it in two steps (see graph):
  1. Set P_H , some people demand Q_H at this price
  2. Offer P_L to remaining consumers who buy Q_L

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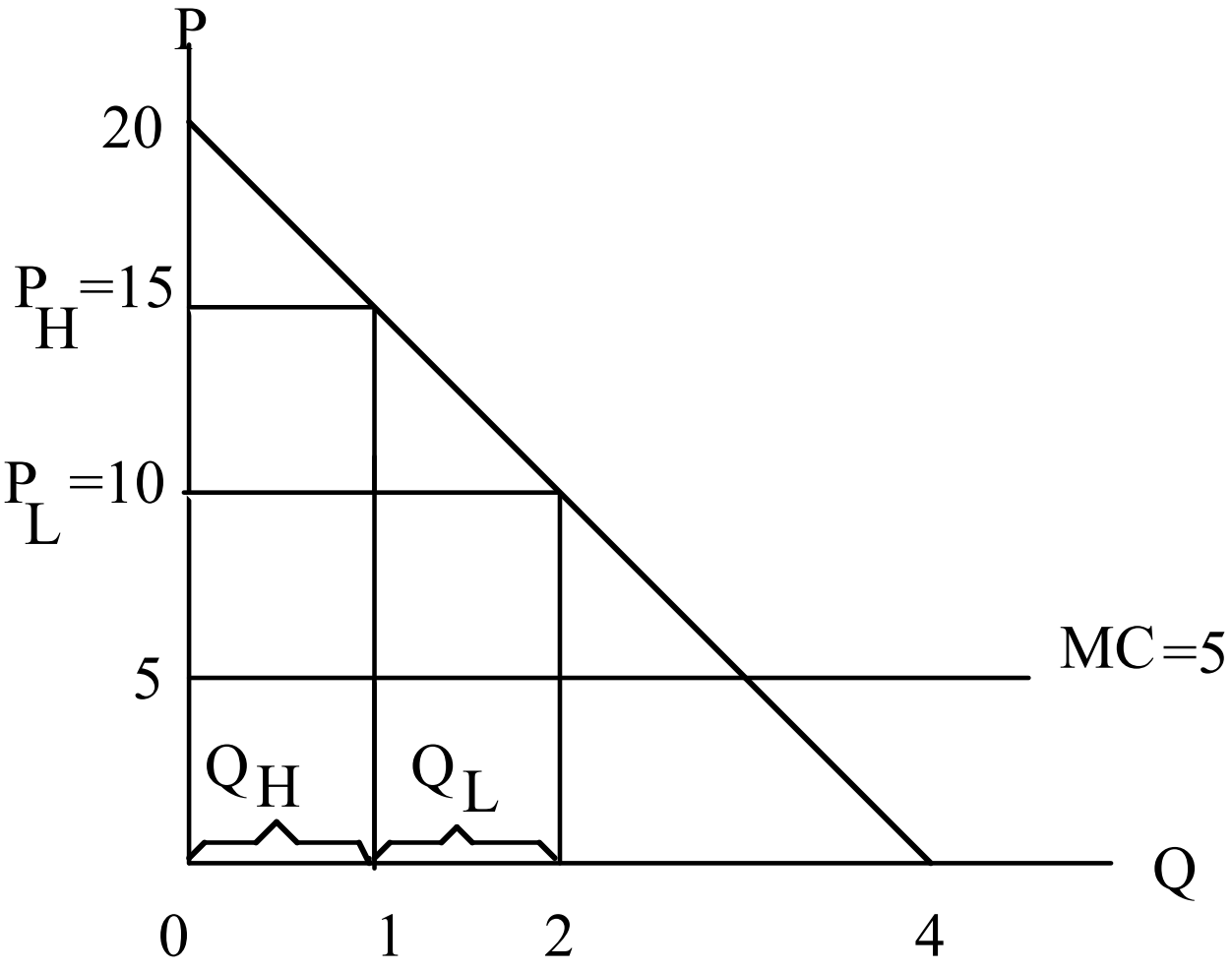
- Profits:

$$\pi = P_H Q_H + P_L Q_L - [5(Q_H + Q_L) + 15]$$

Then just replace P_H and P_L and maximize π


P
20
P_H=15
P_L=10
5
MC=5
Q_H
Q_L
Q
0
1
2
4

b) How much economic profit does Acme make?

$$\pi = P_H Q_H + P_L Q_L - [5(Q_H + Q_L) + 15]$$

$$= 15 \times 1 + 10 \times 1 - [5(1 + 1) + 15]$$

$$= 0$$

c) How much profit would Acme have made if he had been forced to charge the same price to all buyers?

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Standard Rule of Monopolist

$$MC = MR$$

$$5 = 20 - 10Q$$

$$Q = 1.5 \qquad \Rightarrow \qquad P = 12.5$$

c) How much profit would Acme have made if he had been forced to charge the same price to all buyers?

Standard Rule of Monopolist

$$MC = MR$$

$$5 = 20 - 10Q$$

$$Q = 1.5 \qquad \Rightarrow \qquad P = 12.5$$

$$\text{Profits} = P \times Q - TC$$

$$= -3.75$$

d) Are buyers better or worse off as a result of Acme being able to charge two prices?