Unit 4: Imperfect Competition

Monopoly

Characteristics of Monopolies

5 Characteristics of a Monopoly

1. Single Seller

- **One Firm controls the vast majority of a market**
- **The Firm IS the Industry**

2. Unique good with no close substitutes

3. "Price Maker"

The firm can manipulate the price by changing the quantity it produces (ie. shifting the supply curve to the left).

Ex: California electric companies

5 Characteristics of a Monopoly

4. High Barriers to Entry

- **New firms CANNOT enter market**
- **No immediate competitors**
- **Firm can make profit in the long-run**

5. Some "Nonprice" Competition

- **Despite having no close competitors, monopolies still advertise their products in an effort to increase demand.**

Examples of Monopolies

Four Origins of Monopolies

1. **Geography is the Barrier to Entry**

Ex: Nowhere gas stations, De Beers Diamonds, San Diego Chargers, Cable TV, Qualcomm Hot Dogs…

-Location or control of resources limits competition and leads to one supplier.

2. **The Government is the Barrier to Entry**

Ex: Water Company, Firefighters, The Army, Pharmaceutical drugs, rubix cubes…

-Government allows monopoly for public benefits or to stimulate innovation.

-The government issues <u>patents</u> to protect inventors and forbids others from using their invention. (They last 20 years)

Four Origins of Monopolies

3. Technology or Common Use is the Barrier to Entry

Ex: Microsoft, Intel, Frisbee, Band-Aide…

-Patents and widespread availability of certain products lead to only one major firm controlling a market.

4. Mass Production and Low Costs are Barriers to Entry

Ex: Electric Companies (SDGE)

- **If there were three competing electric companies they would have higher costs.**
- **Having only one electric company keeps prices low**

-Economies of scale make it impractical to have smaller firms.

Natural Monopoly- It is NATURAL for only one firm to produce because they can produce at the lowest cost.

Drawing Monopolies

Good news…

1. Only one graph because the firm IS the industry.
2. The cost curves are the same
3. The MR= MC rule still applies
4. Shut down rule still applies

The Main Difference

- **Monopolies (and all Imperfectly competitive firms) have downward sloping demand curve.**
- **Which means, to sell more a firm must lower its price.**
- **This changes MR…**

THE MARGINAL REVENUE DOESN'T EQUAL THE PRICE!

Why is MR less than Demand?

P	Qd	TR	MR
$11	0	0	-

Why is MR less than Demand?

$10

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10

Why is MR less than Demand?

$10

$9	$9

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8

Why is MR less than Demand?

$10		
$9	$9	
$8	$8	$8

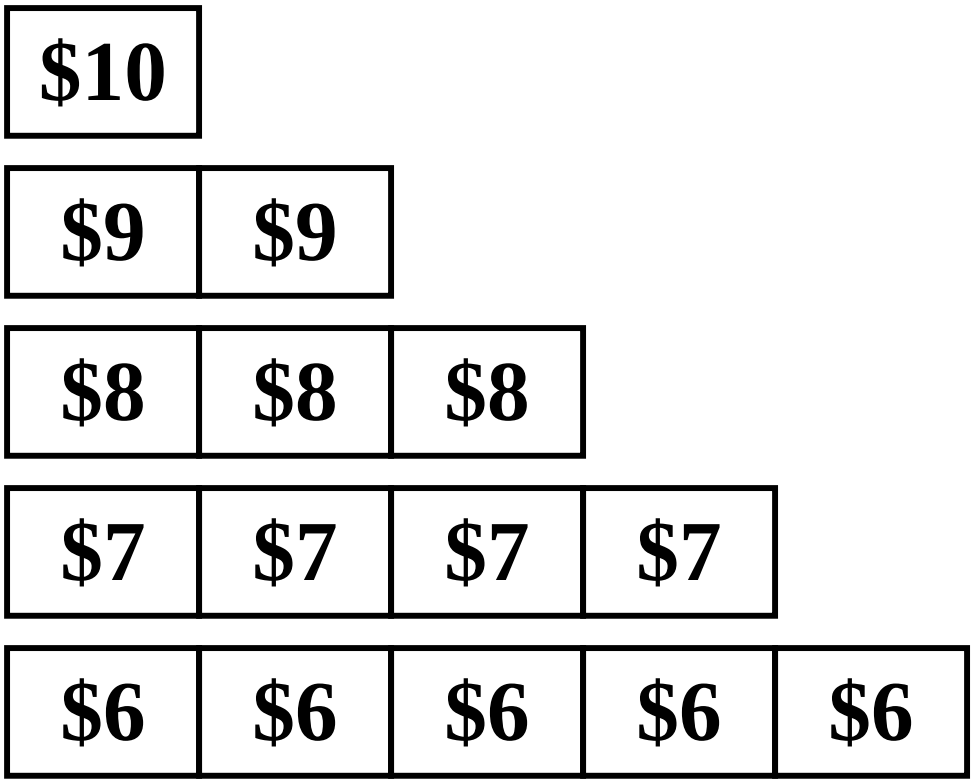
P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8
$8	3	24	6

Why is MR less than Demand?

$10			
$9	$9		
$8	$8	$8	
$7	$7	$7	$7

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8
$8	3	24	6
$7	4	28	4

Why is MR less than Demand?



P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8
$8	3	24	6
$7	4	28	4
$6	5	30	2

Why is MR less than Demand?

$10					
$9	$9				
$8	$8	$8			
$7	$7	$7	$7		
$6	$6	$6	$6	$6	
$5	$5	$5	$5	$5	$5

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8
$8	3	24	6
$7	4	28	4
$6	5	30	2
$5	6	30	0

Why is MR less than Demand?

$10

$9	$9

$8	$8	$8

$7	$7	$7	$7

$6	$6	$6	$6	$6

$5	$5	$5	$5	$5	$5

$4	$4	$4	$4	$4	$4	$4

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	18	8
$8	3	24	6
$7	4	28	4
$6	5	30	2
$5	6	30	0
$4	7	28	-2

Why is MR less than Demand?

$10						
$9	$9					
$8	$8	$8				
$7	$7	$7	$7			
$6	$6	$6	$6	$6		
$5	$5	$5	$5	$5	$5	
$4	$4	$4	$4	$4	$4	$4

P	Qd	TR	MR
$11	0	-	-
$10	1	10	10
$9	2	18	8
$8	3	24	6
$7	4	28	4
$6	5	30	2
$5	6	30	0
$4	7	28	-2

Why is MR less than Demand?

P	Qd	TR	MR
	0	-	-
	1	[illegible]	10
	[illegible]	18	8
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	4
	[illegible]	[illegible]	2
	[illegible]	30	0
	[illegible]	28	-2

$10						
$9	$9					
$8	$8					
$7	$7					
$6	$6	$6				
$5	$5	$5	$5	$5	$5	
$4	$4	$4	$4	$4	$4	$4

MR IS LESS THAN PRICE

Calculating Marginal Revenue

To sell more a firm must lower its price. What happens to Marginal Revenue?

Price	Quantity Demanded	Total Revenue	Marginal Revenue
$6	0		
$5	1		
$4	2		
$3	3		
$2	4		
$1	5		

Does the Marginal Revenue equal the price?

To sell more a firm must lower its price. What happens to Marginal Revenue?

Price	Quantity Demanded	Total Revenue	Marginal Revenue
$6	0	0	
$5	1	5	
$4	2	8	
$3	3	9	
$2	4	8	
$1	5	5	

Does the Marginal Revenue equal the price?

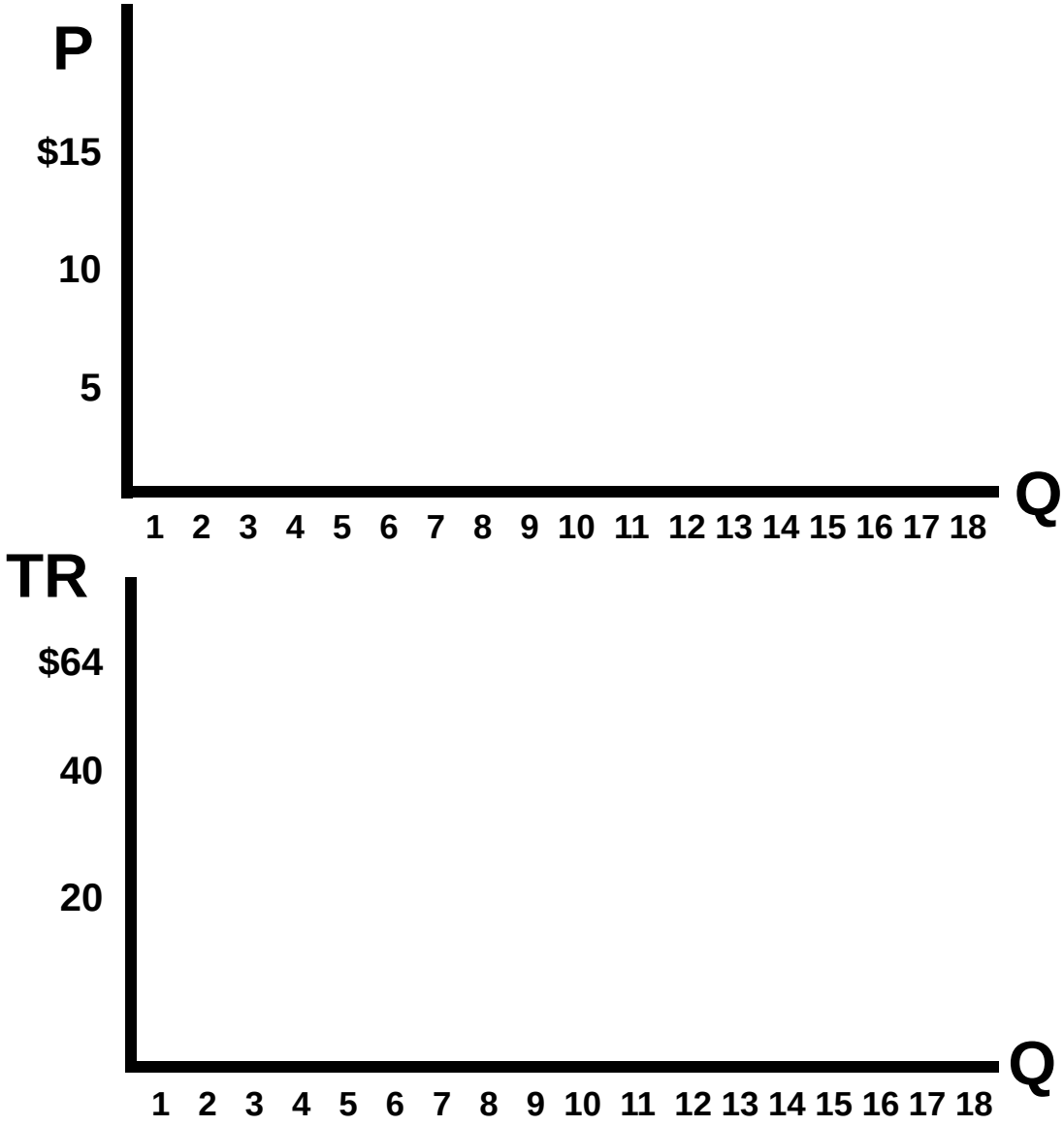
To sell more a firm must lower its price. What happens to Marginal Revenue?

Price	Quantity	Total Revenue	Marginal Revenue
$6			
$5			
$4			
$3			1
$2	4		-1
$1	5		-3

MR DOESN'T EQUAL PRICE

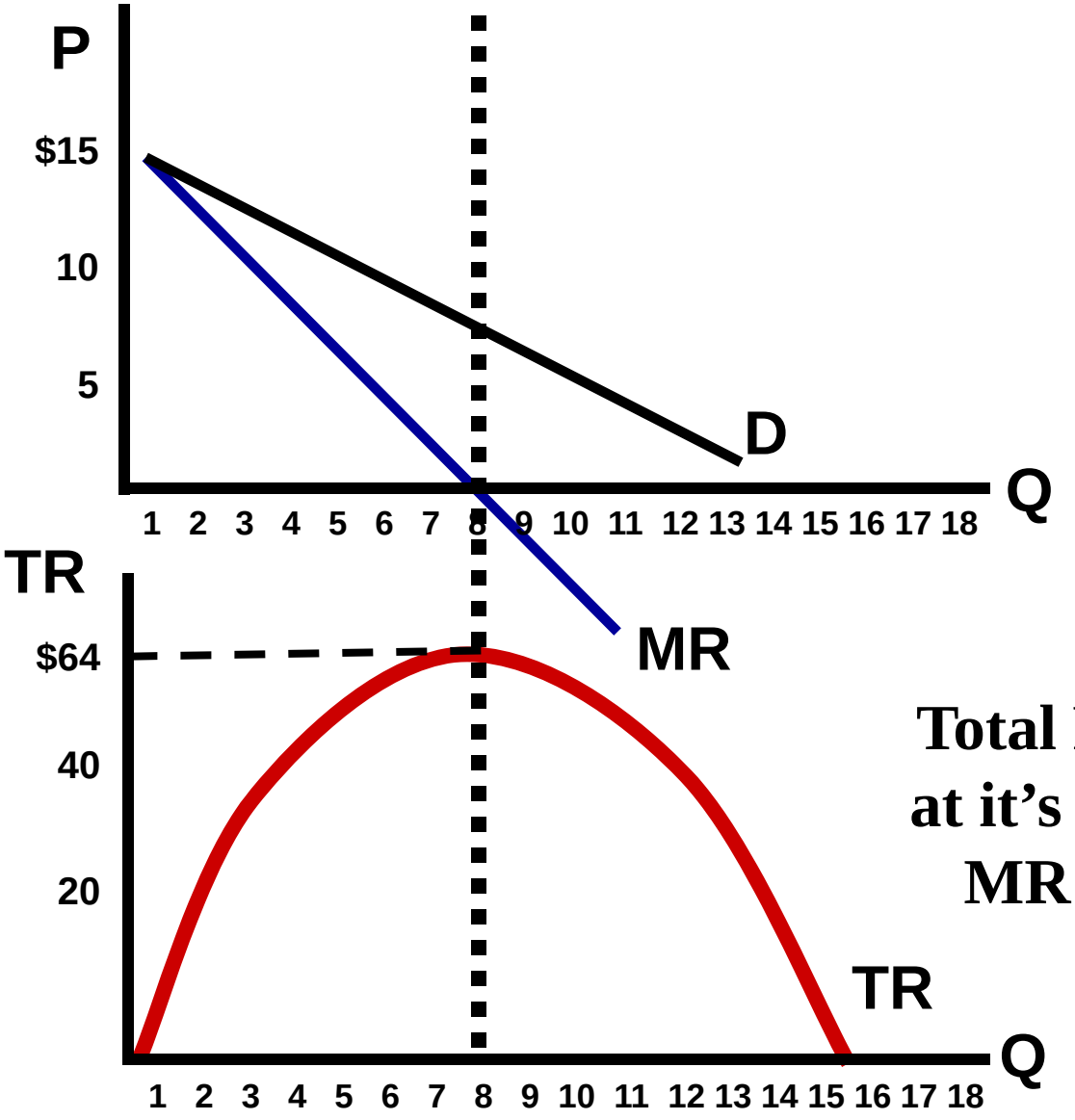
Draw Demand and Marginal Revenue Curves

Plot the Demand, Marginal Revenue, and Total Revenue Curves



Demand and Marginal Revenue Curves

What happens to TR when MR hits zero?

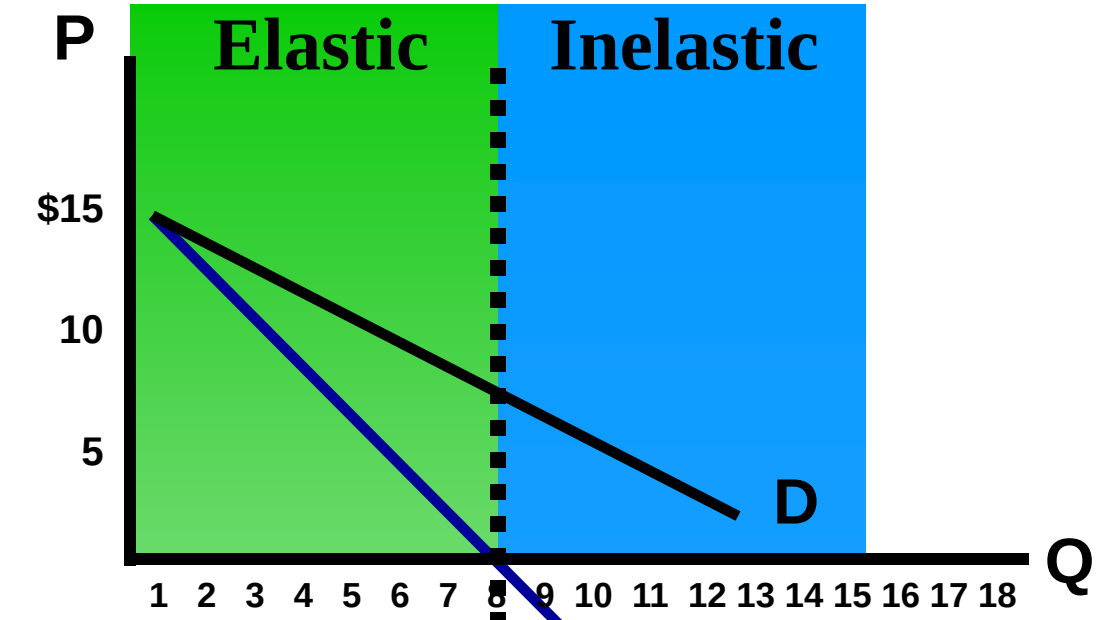


Total Revenue is at it's peak when MR hits zero

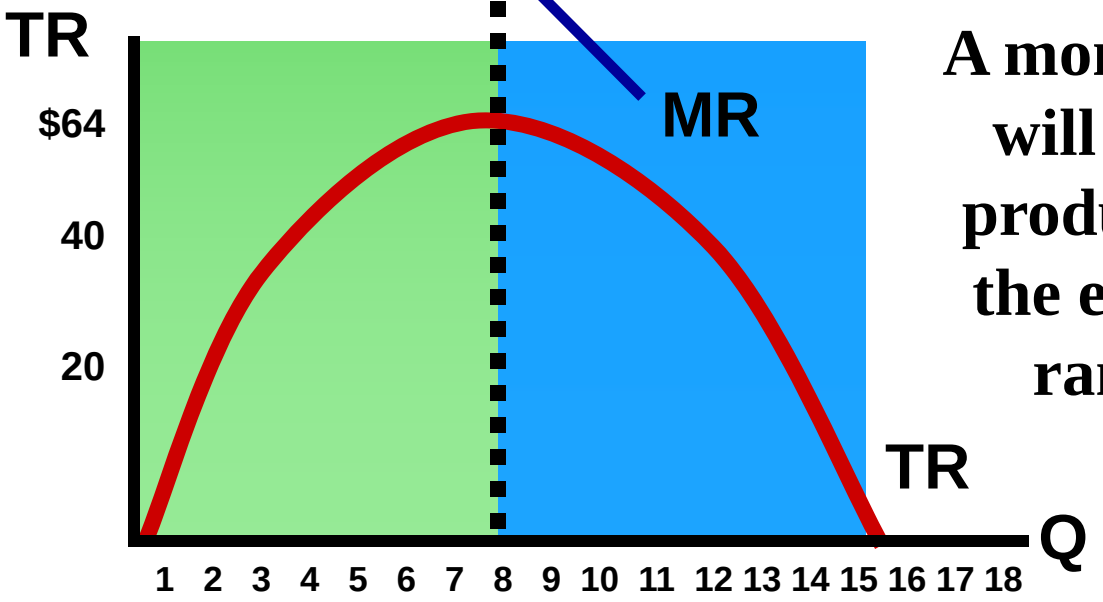
Elastic vs. Inelastic Range of Demand Curve

Elastic and Inelastic Range

Total Revenue Test
If price falls and TR increases then demand is elastic.



Total Revenue Test
If price falls and TR falls then demand is inelastic.



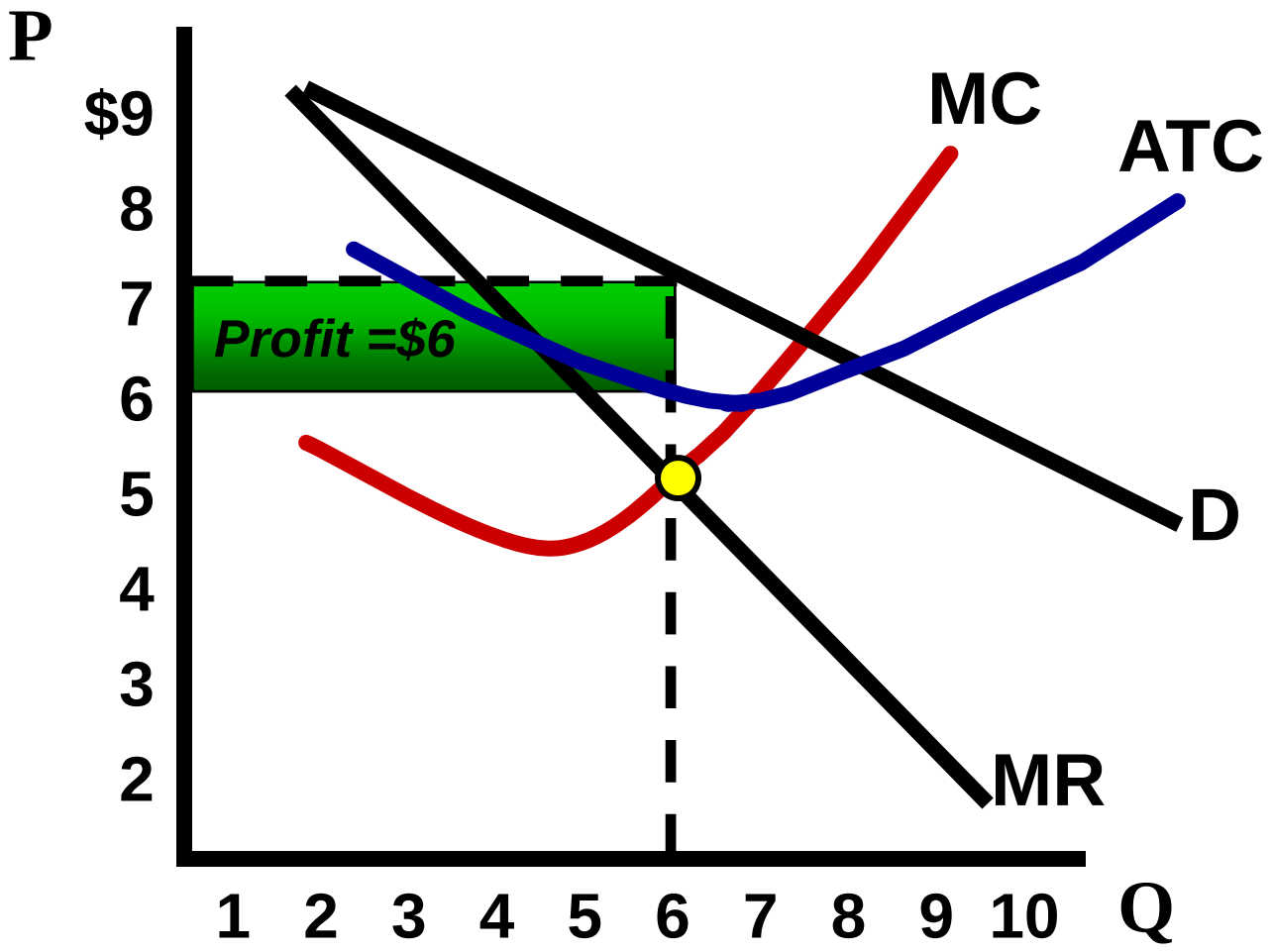
A monopoly will only produce in the elastic range

Maximizing Profit

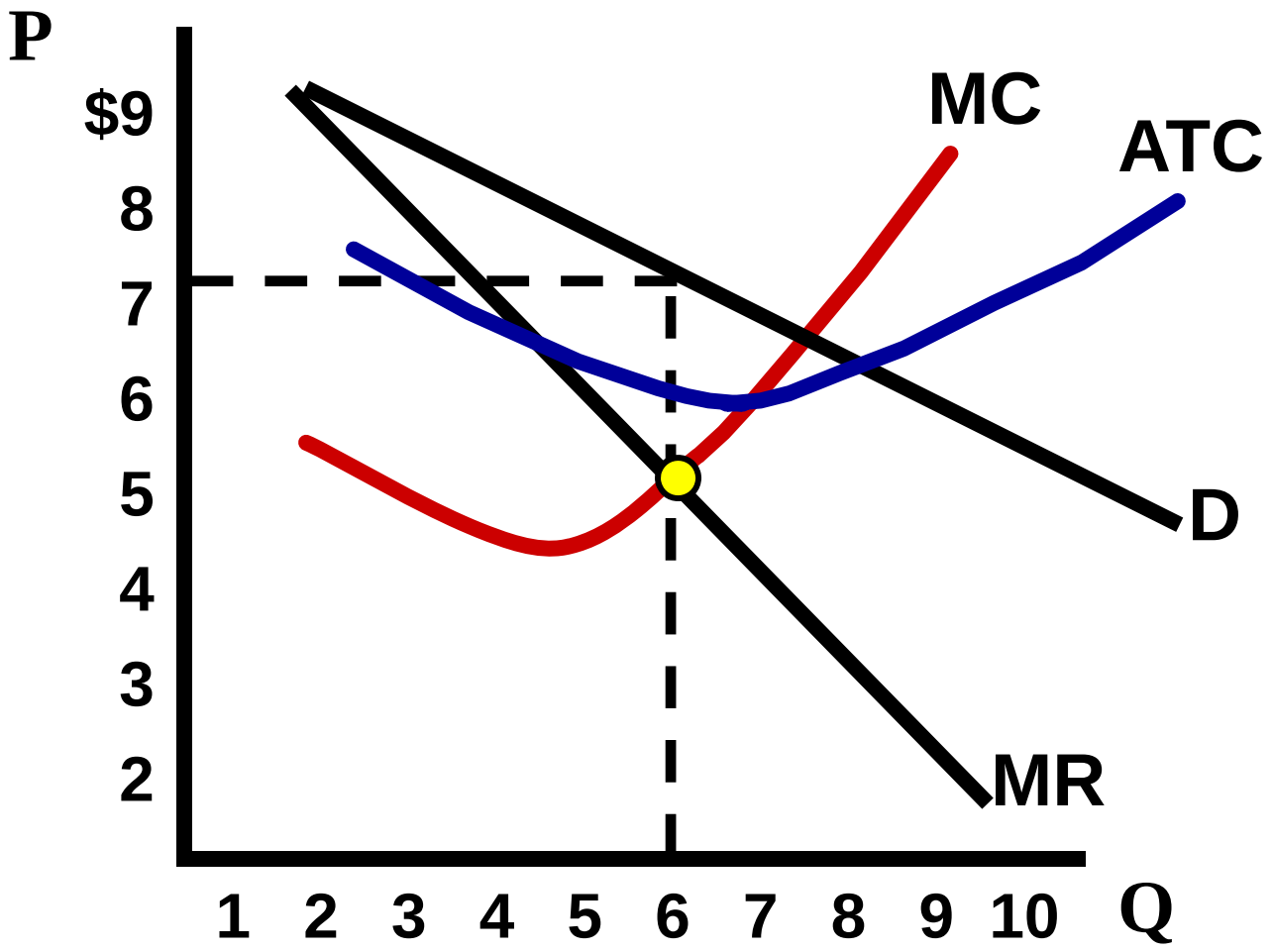
What output should this monopoly produce?

MR = MC

How much is the TR, TC and Profit or Loss?

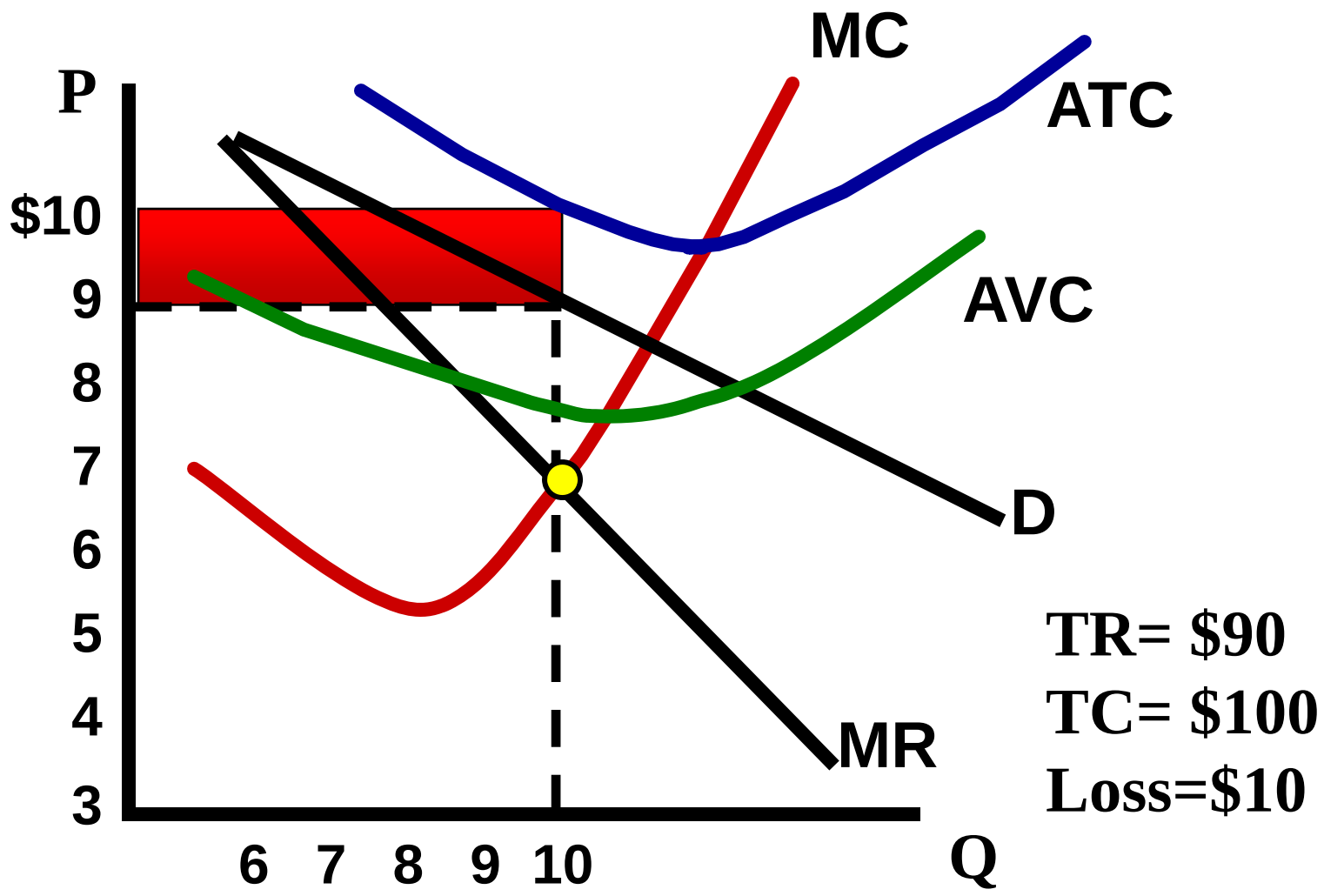


Conclusion: **A monopolists produces where MR=MC, buts charges the price consumer are willing to pay identified by the demand curve.**



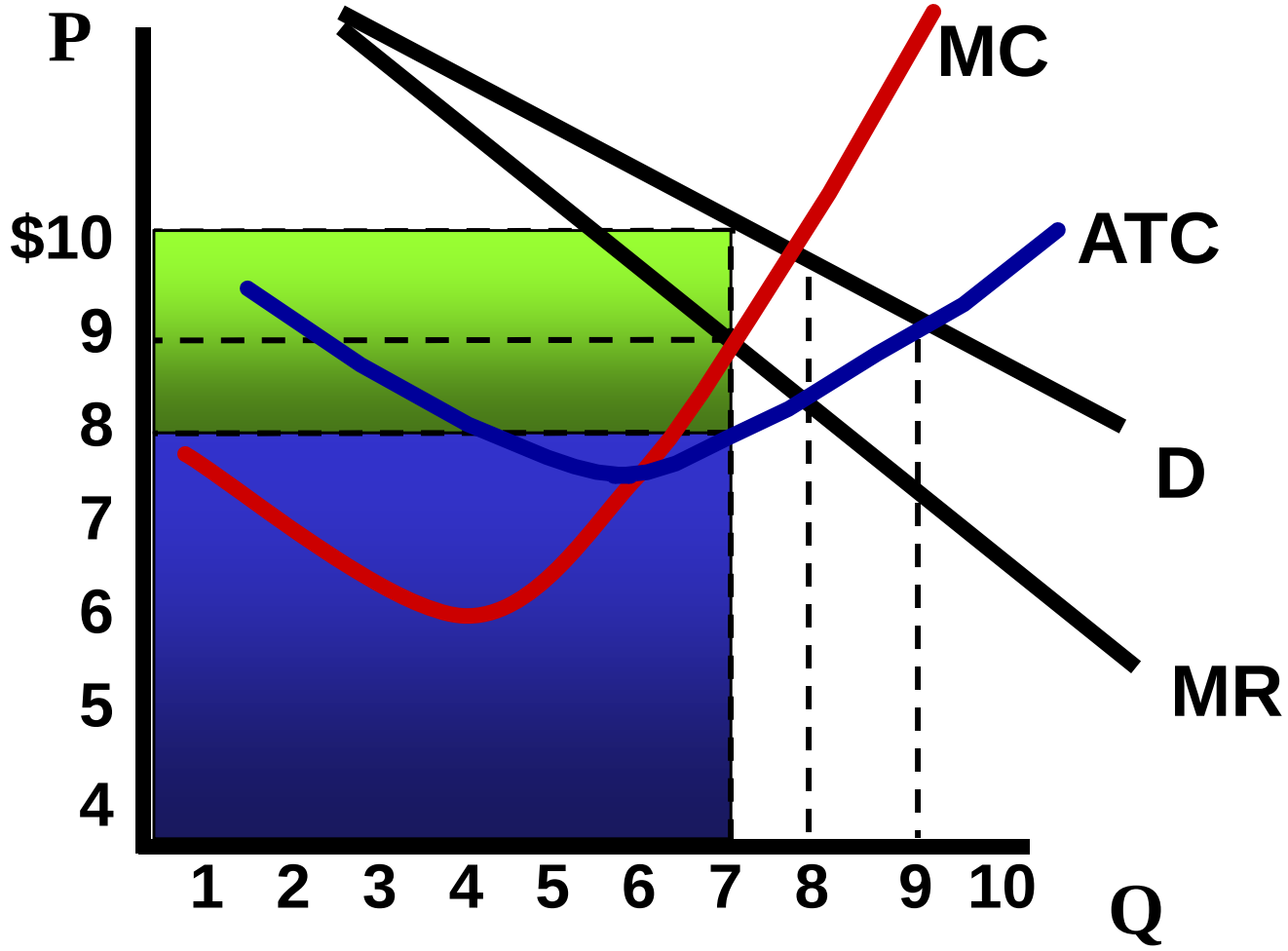
What if cost are higher?

How much is the TR, TC, and Profit or Loss?



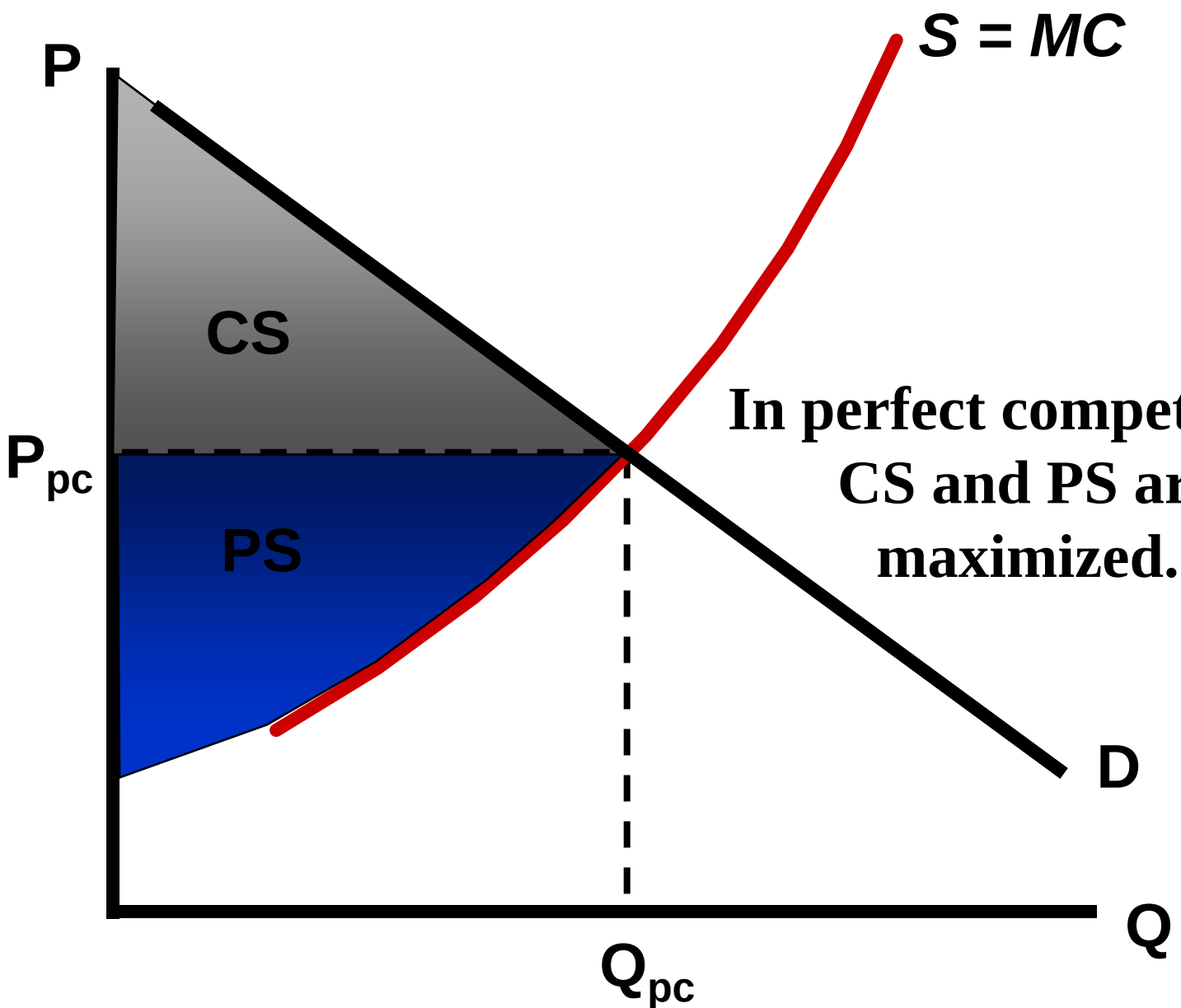
Identify and Calculate:

TR= $70
TC= $56
Profit/Loss= $14
Profit/Loss per Unit= $2



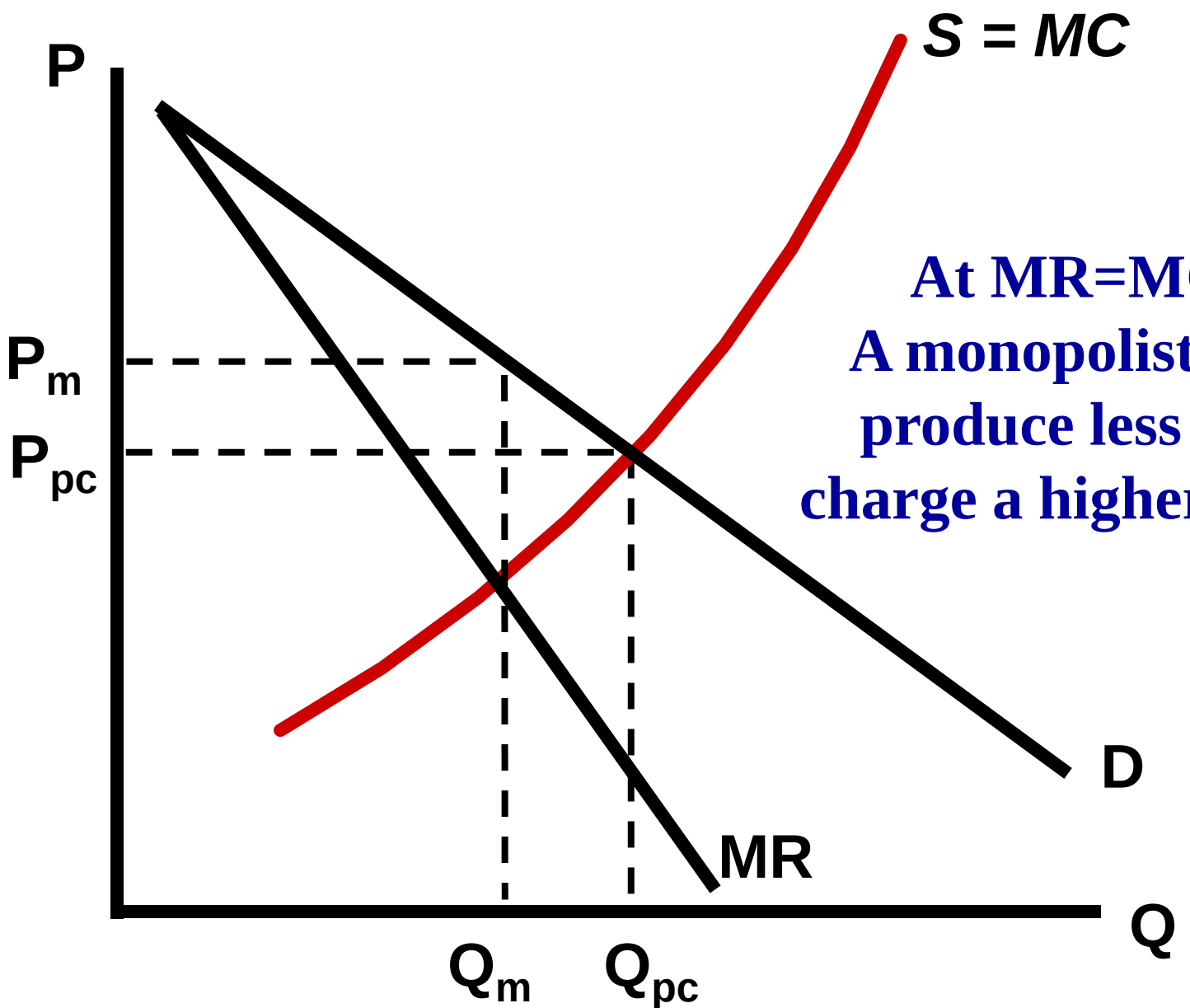
Are Monopolies Efficient?

Monopolies vs. Perfect Competition



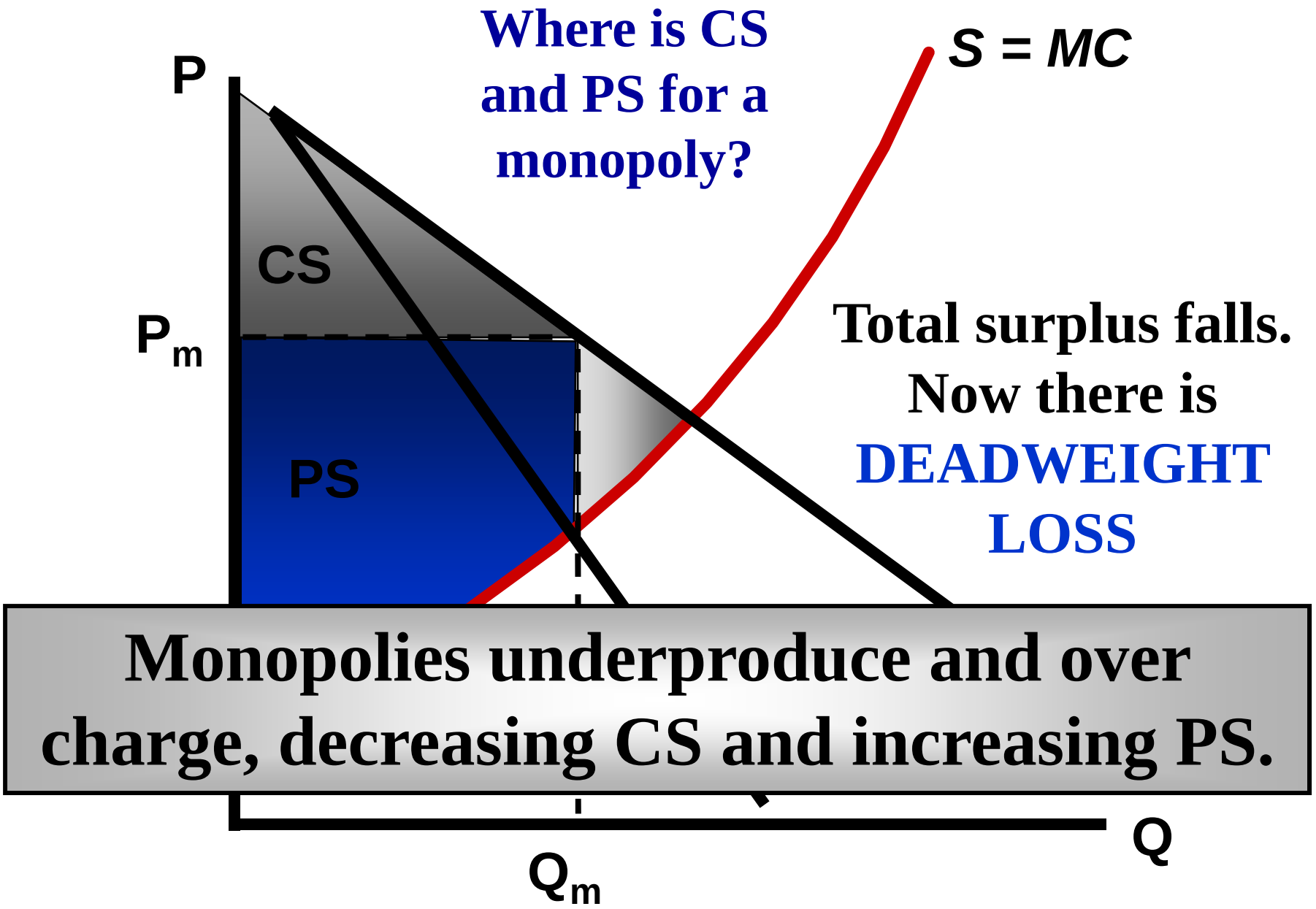
In perfect competition, CS and PS are maximized.

Monopolies vs. Perfect Competition



At MR=MC, A monopolist will produce less and charge a higher price

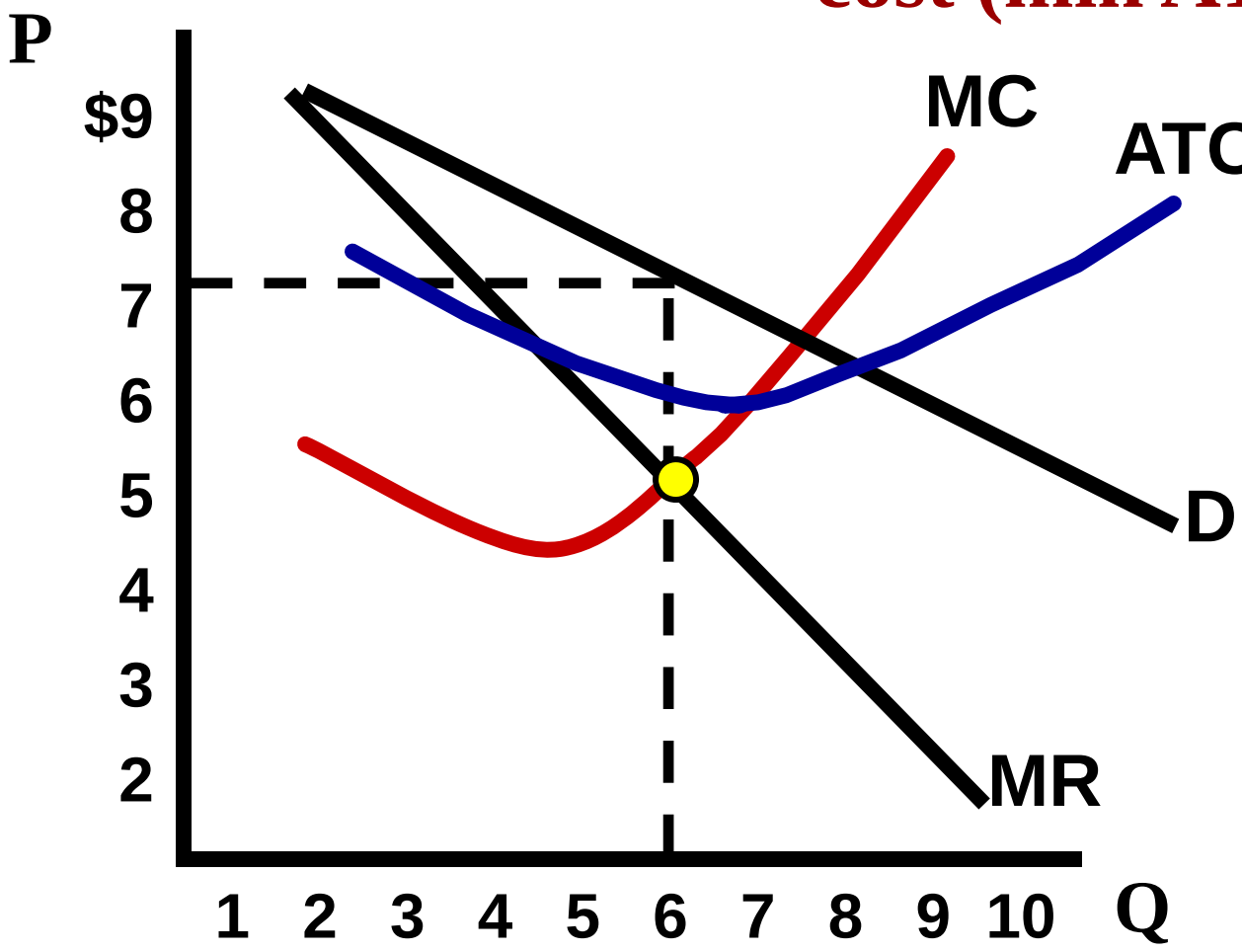
Monopolies vs. Perfect Competition



Are Monopolies Productively Efficient?

Does Price = Min ATC?

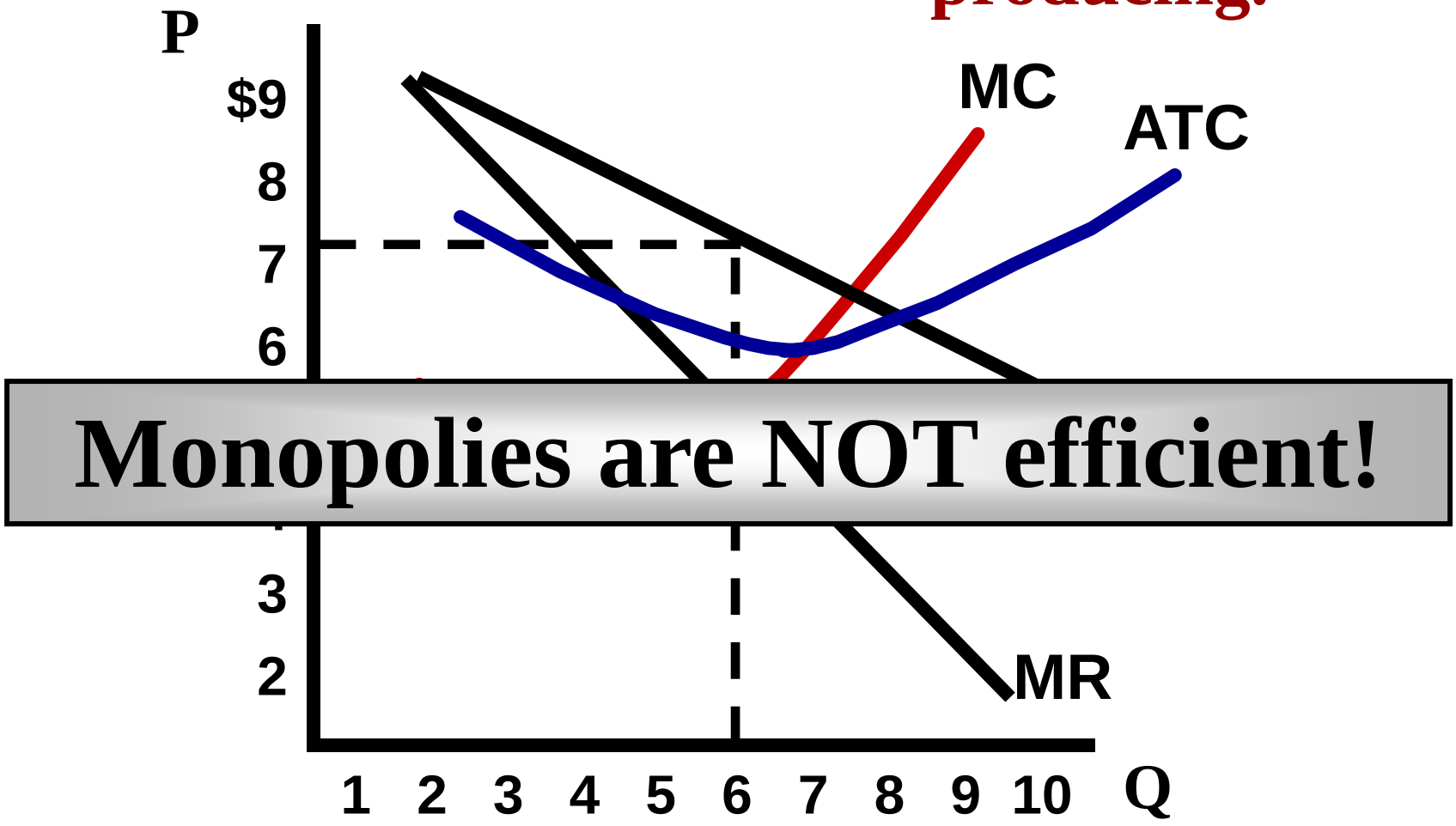
No. They are not producing at the lowest cost (min ATC)



Are Monopolies Allocatively Efficiency?

Does Price = MC?

No. Price is greater. The monopoly is under producing.



Monopolies are NOT efficient!

Monopolies are <u>inefficient</u> because they…

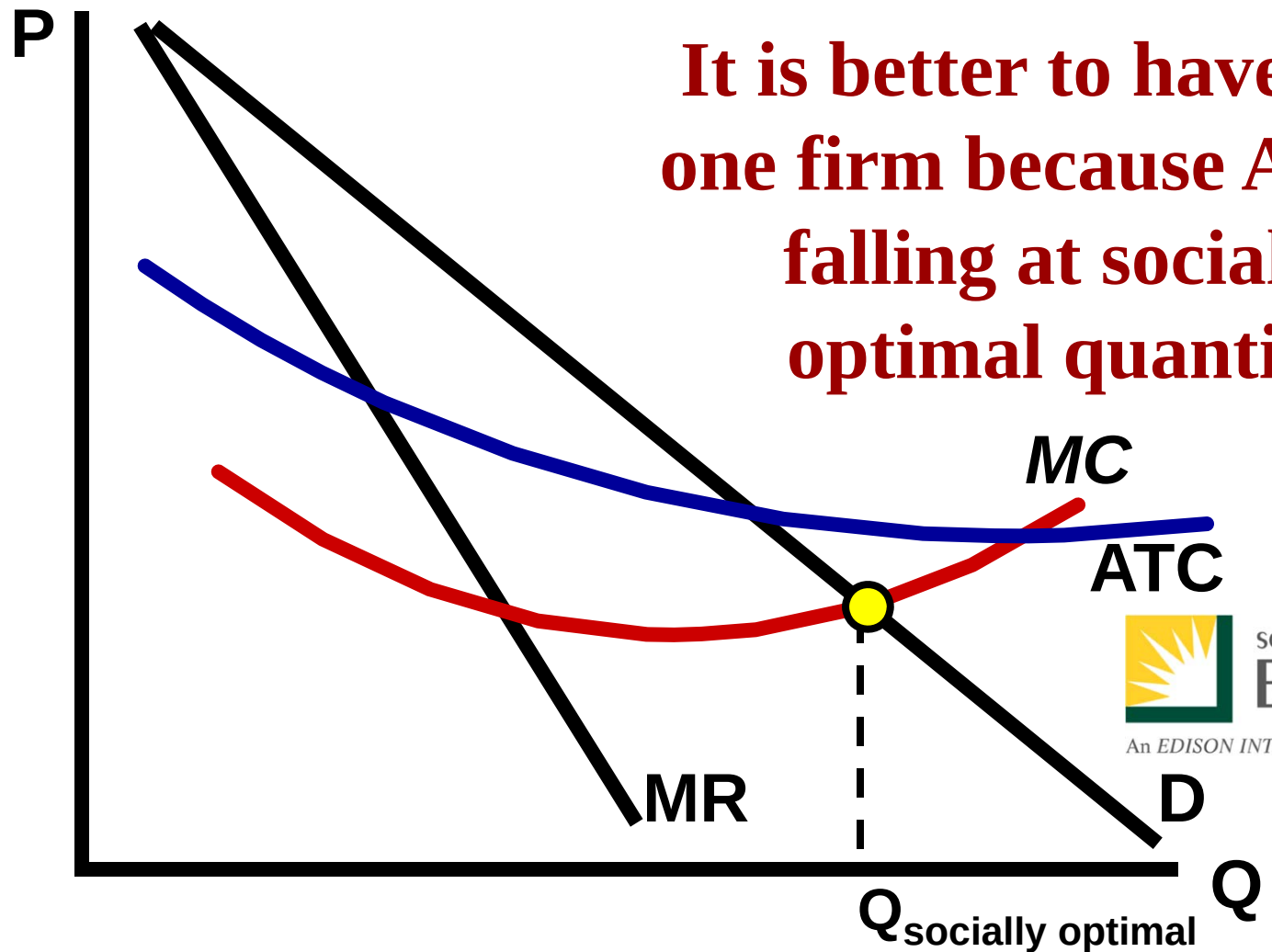
1. **Charge a higher price**
2. **Don't produce enough**
   - **Not allocatively efficiency**
3. **Produce at higher costs**
   - **Not productively efficiency**
4. **Have little incentive to innovate**

Why?

Because there is little external pressure to be efficient

Natural Monopoly

One firm can produce the socially optimal quantity at the lowest cost due to economies scale.



It is better to have only one firm because ATC is falling at socially optimal quantity

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Lump Sum vs. Per Unit Taxes and Subsidies

ACDC Econ Video

2007 FRQ #1

1. A patent gives inventors the exclusive right to produce and market a product for a period of time. GCR Company is a profit-maximizing firm. It has a patent for a unique antispyware computer program called Aspy.

   (a) Assume that GCR is making economic profit. Draw a correctly labeled graph and show the profit-maximizing price and quantity.

   (b) Assume that the government imposes a lump-sum tax on GCR.

      (i) What will happen to output and market price? Explain.

      (ii) What will happen to GCR's profits?

   (c) Assume instead that the government grants a per-unit subsidy to GCR for Aspy.

      (i) What will happen to output and market price? Explain.

      (ii) What will happen to GCR's profits?

   (d) Now assume that GCR's patent on Aspy expires. What will happen to GCR's economic profits in the long run? Explain.

Are Monopolies Efficient?

Monopolies are <u>inefficient</u> because they…

1. **Charge a higher price**
2. **Don't produce enough**
   - **Not allocatively efficiency**
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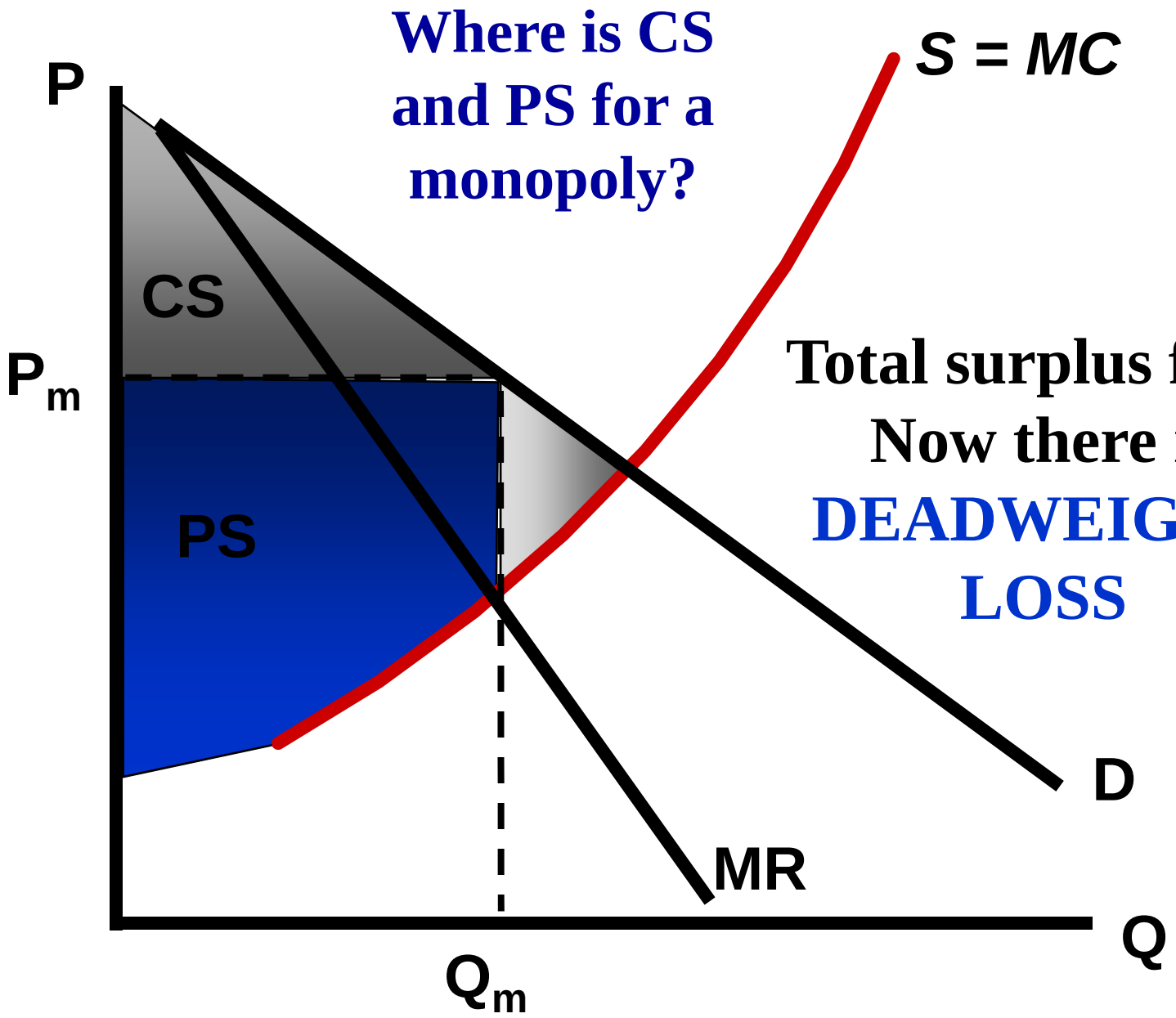
Monopolies vs. Perfect Competition



Regulating Monopolies

Why Regulate?

Why would the government regulate an monopoly?

1. **To keep prices low**
2. **To make monopolies efficient**

How do they regulate?

- **Use Price controls: <u>Price Ceilings</u>**
- **Why don't taxes work?**
  - **Taxes limit supply and that's the problem**

Where should the government place the price ceiling?

1.Socially Optimal Price

P = MC (Allocative Efficiency)

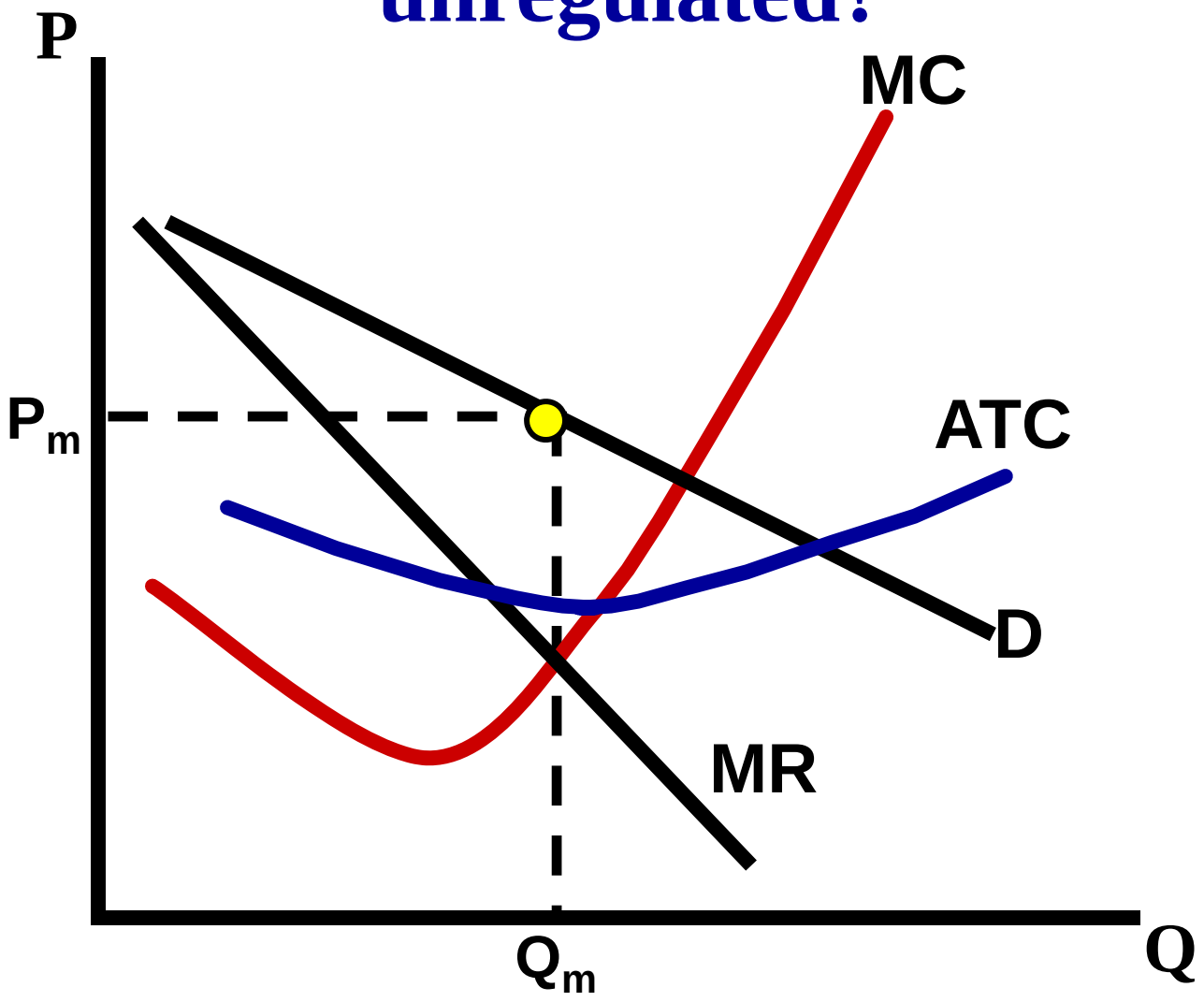
OR

2. Fair-Return Price (Break–Even)

P = ATC (Normal Profit)

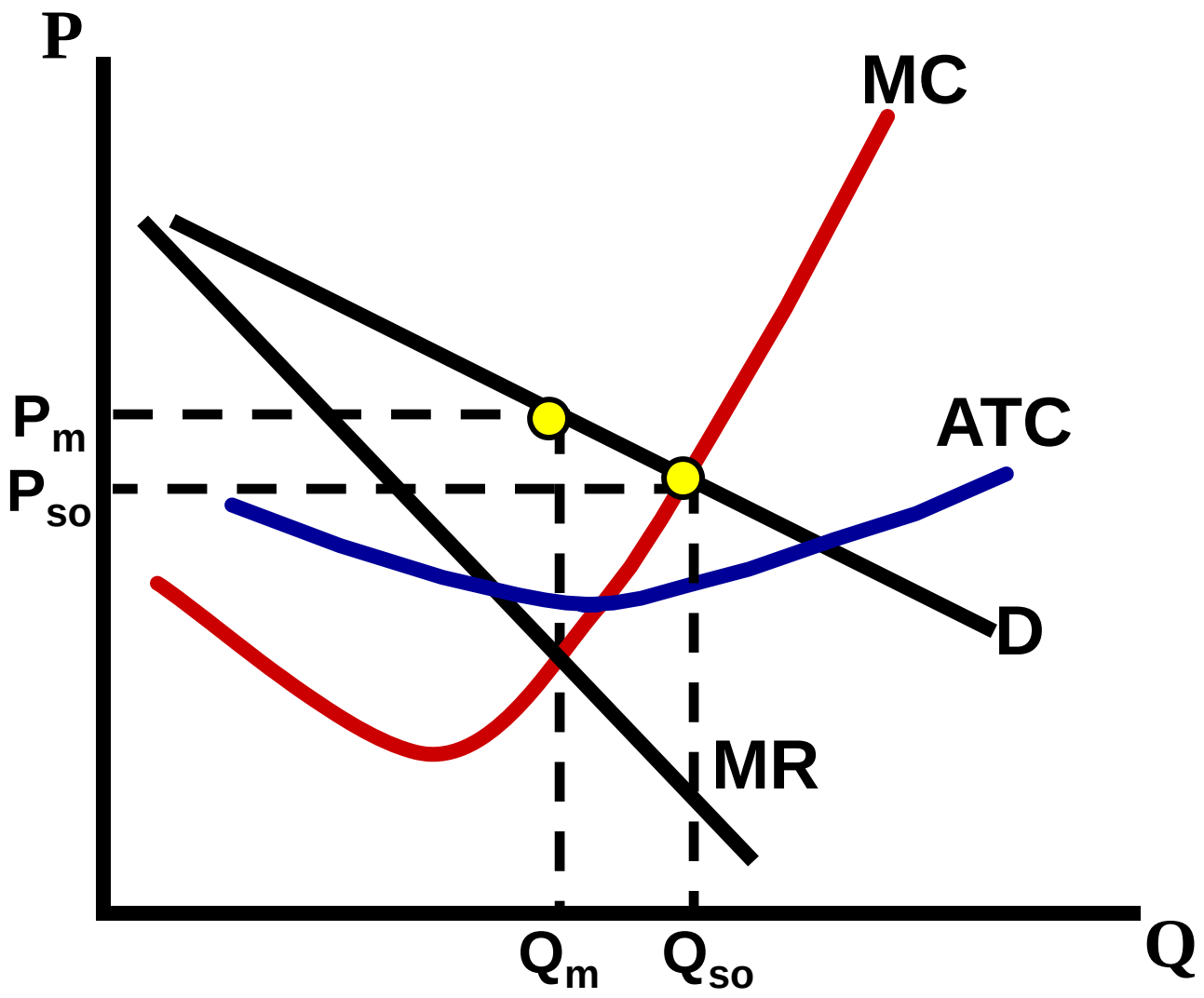
Regulating Monopolies

Where does the firm produce if it is unregulated?



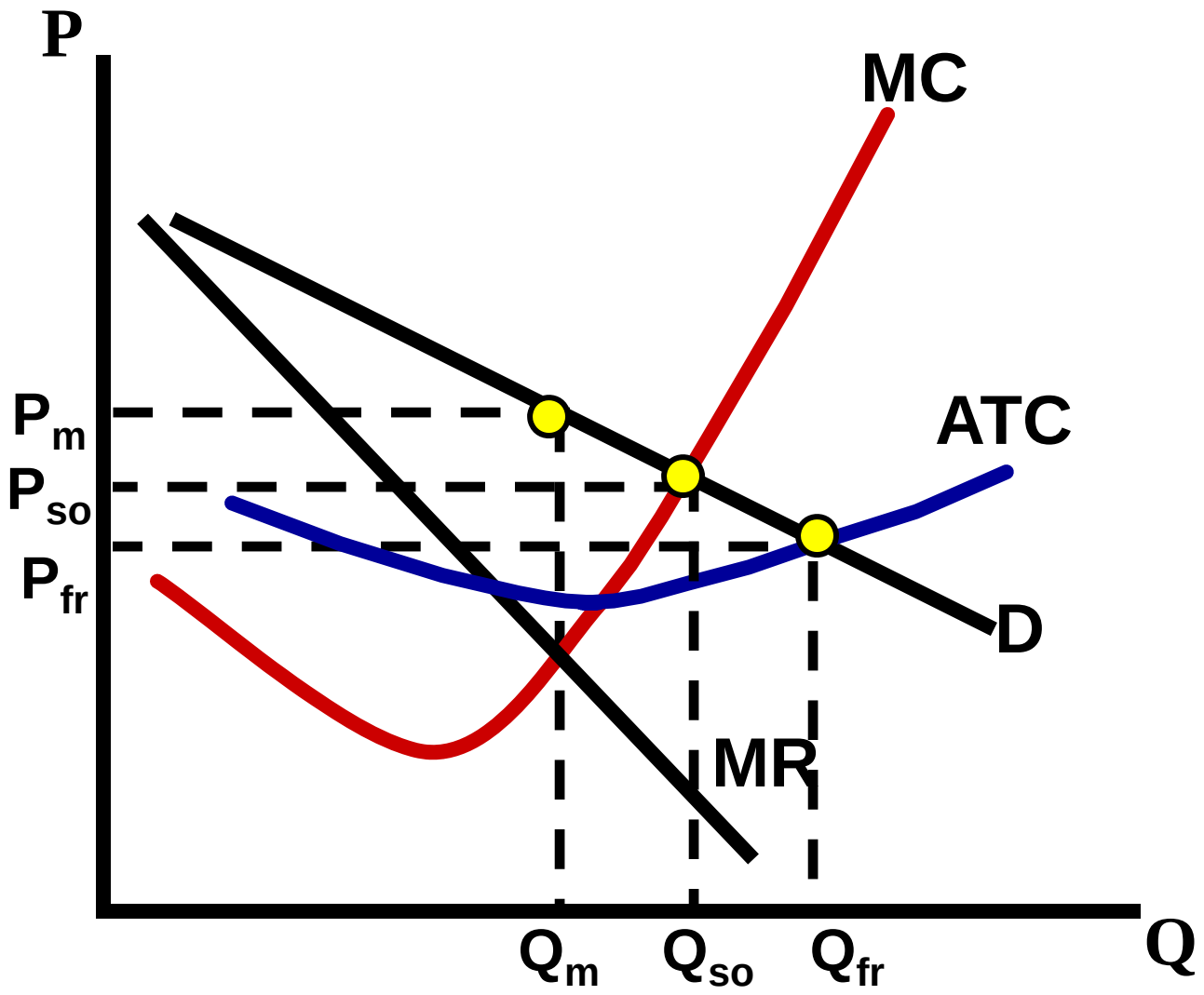
Regulating Monopolies

Socially Optimal = Allocative Efficiency

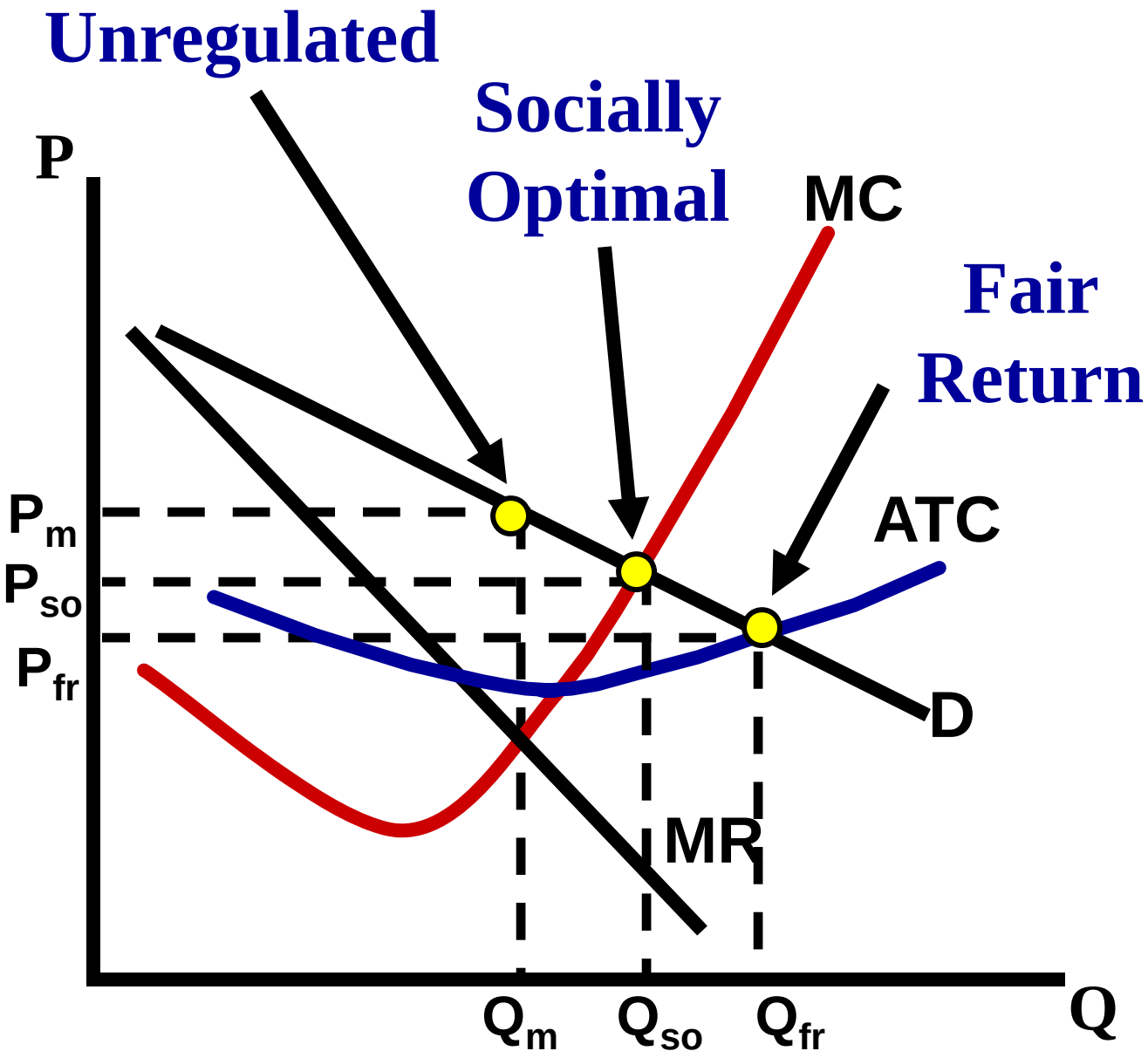


Regulating Monopolies

Fair Return means no economic profit

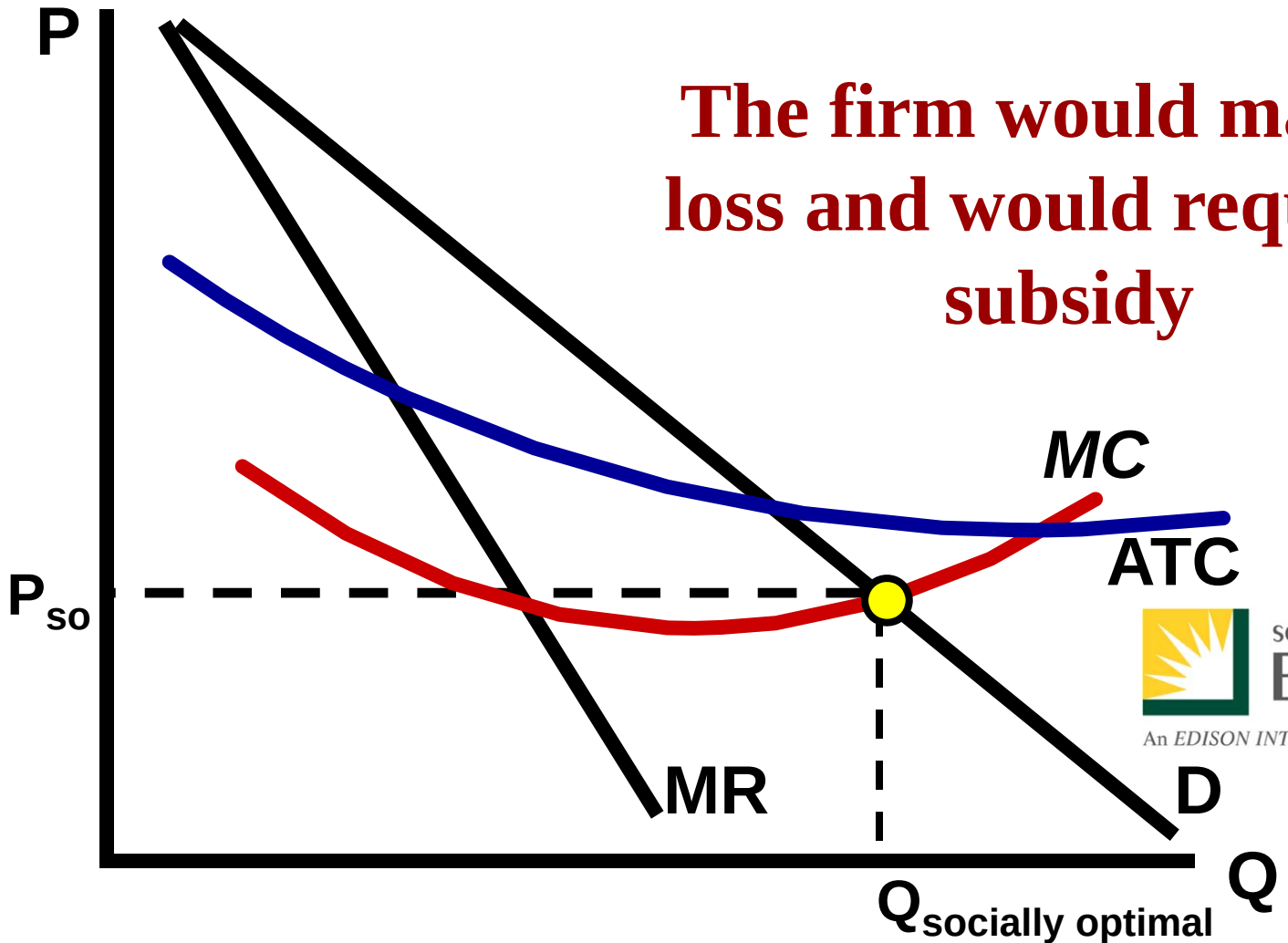


Regulating Monopolies



Regulating a Natural Monopoly

What happens if the government sets a price ceiling to get the socially optimal quantity?



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Price Discrimination

Price Discrimination

Definition:

Practice of selling the same products to different buyers at different prices

Examples:

- **Airline Tickets (vacation vs. business)**
- **Movie Theaters (child vs. adult)**
- **All Coupons (spenders vs. savers)**
- **SPHS football games (students vs. parents)**

PRICE DISCRIMINATION

- **Price discrimination seeks to charge each consumer what they are willing to pay in an effort to increase profits.**
- **Those with inelastic demand are charged more than those with elastic**

Requires the following conditions:

1. **Must have monopoly power**
2. **Must be able to segregate the market**
3. **Consumers must NOT be able to resell product**

P	Qd	TR	MR
$11	0	0	-

Results of Price Discrimination

$10

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10

Results of Price Discrimination

$10

$10	$9

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	19	9

Results of Price Discrimination

$10

$10	$9

$10	$9	$8

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	19	9
$8	3	27	8

Results of Price Discrimination

$10			
$10	$9		
$10	$9	$8	
$10	$9	$8	$7

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	19	9
$8	3	27	8
$7	4	34	7

Results of Price Discrimination

$10						
$10	$9					
$10	$9	$8				
$10	$9	$8	$7			
$10	$9	$8	$7	$6		
$10	$9	$8	$7	$6	$5	
$10	$9	$8	$7	$6	$5	$4

P	Qd	TR	MR
$11	0	0	-
$10	1	10	10
$9	2	19	$9
$8	3	27	$8
$7	4	34	$7
$6	5	40	$6
$5	6	45	$5
$4	7	49	$4

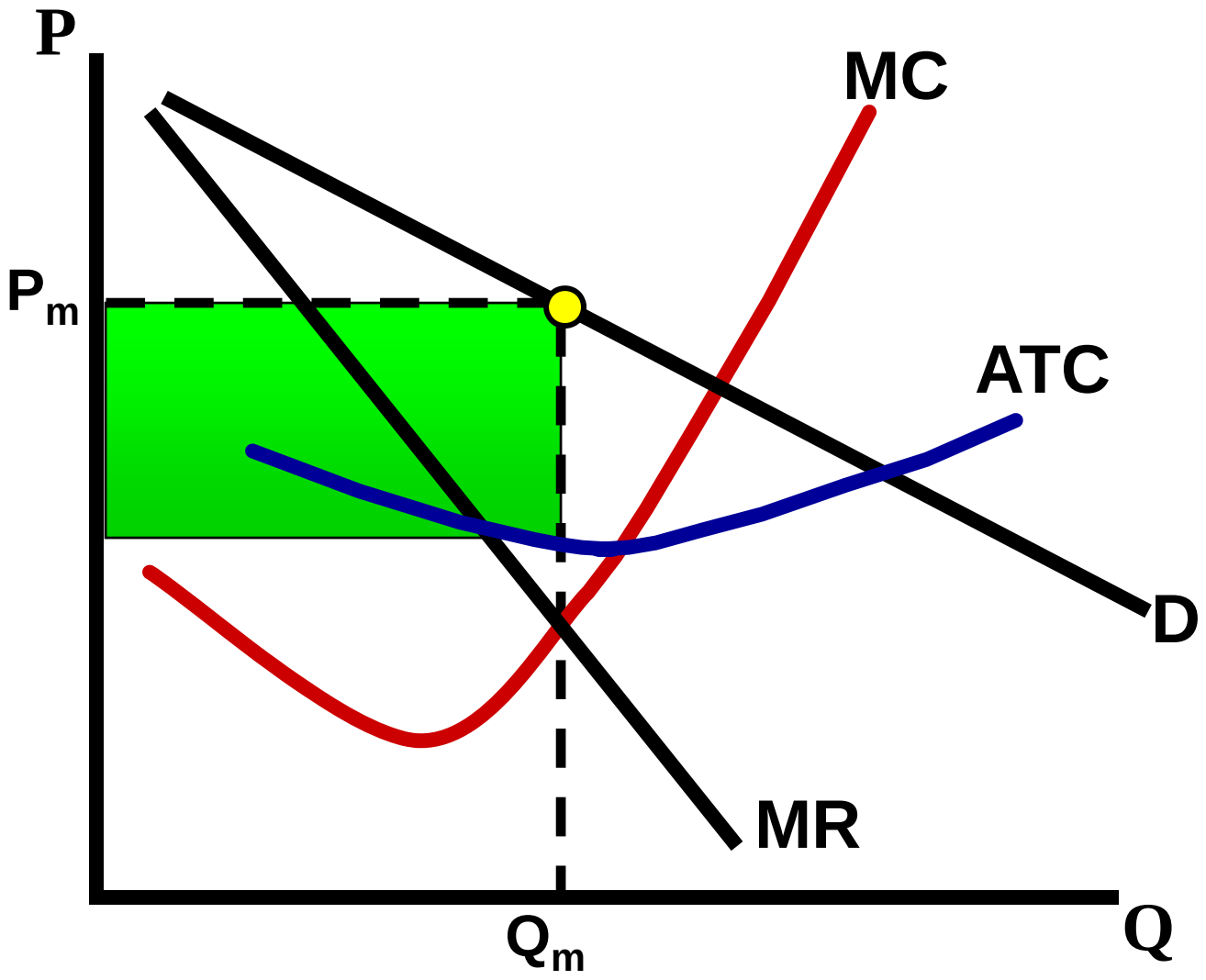
P	Qd	TR	MR
	0	0	-
	1	[illegible]0	10
	[illegible]	19	$9
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]4	$7
	[illegible]	[illegible]	$6
	[illegible]	45	$5
	[illegible]4	49	$4

$10						
$10	$9					
$10	$9					
$10	$9					
$10	$9	$8				
$10	$9	$8	$7	[illegible]	$5	
$10	$9	$8	$7	$6	$5	$4

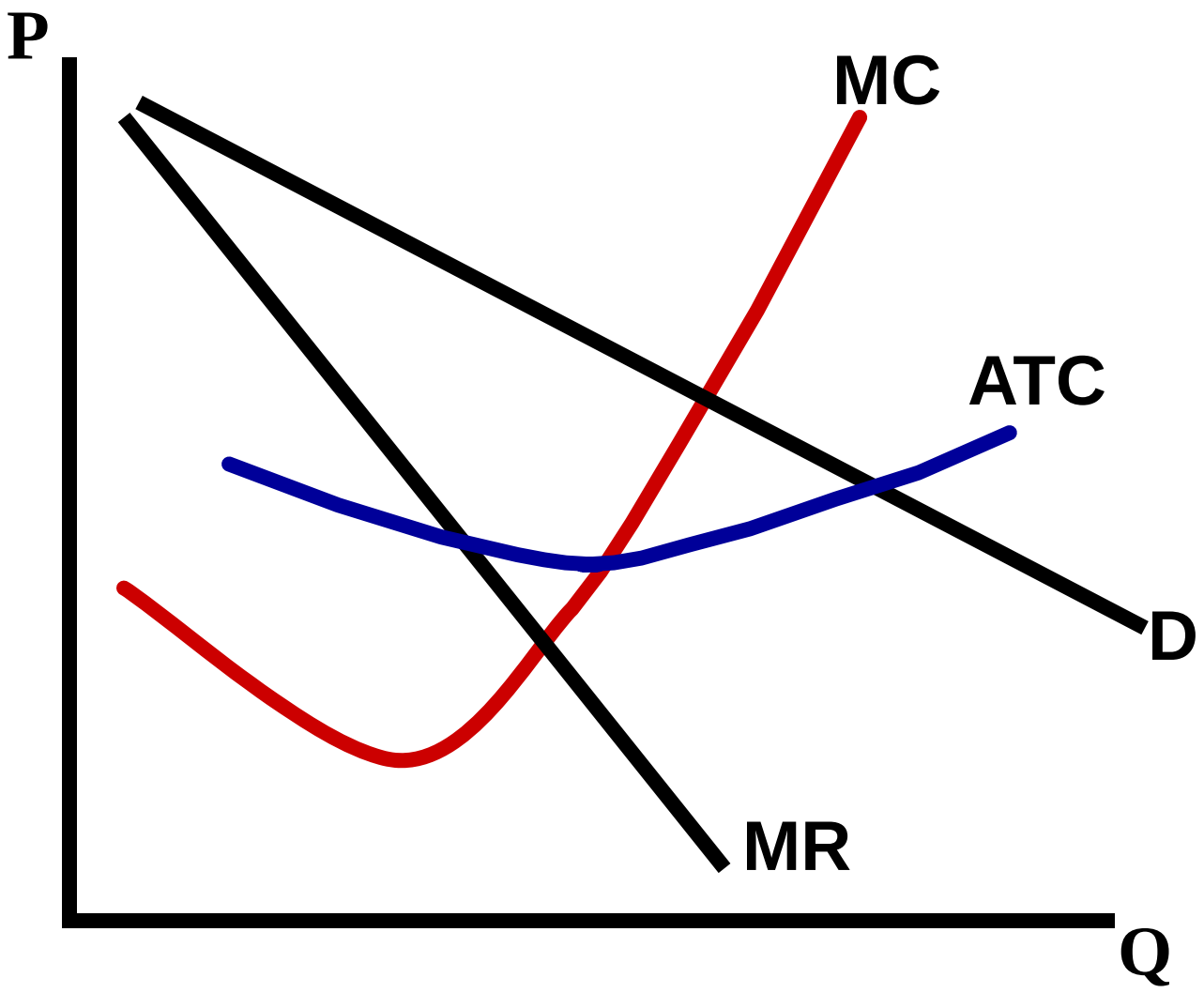
WHEN PRICE DISCIMINATING

MR = D

Regular Monopoly vs. Price Discriminating Monopoly

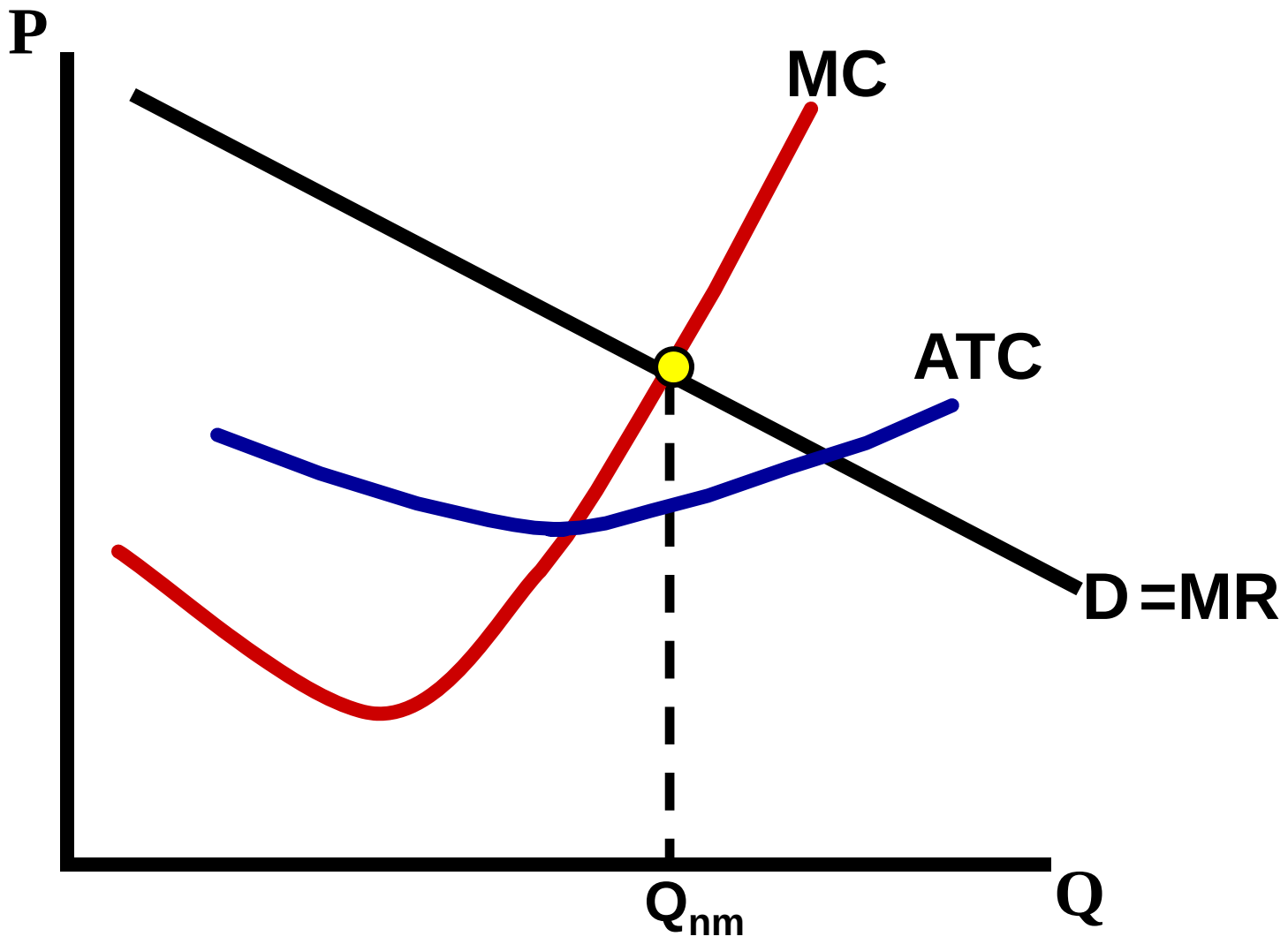


A perfectly discriminating can charge each person differently so the Marginal Revenue = Demand



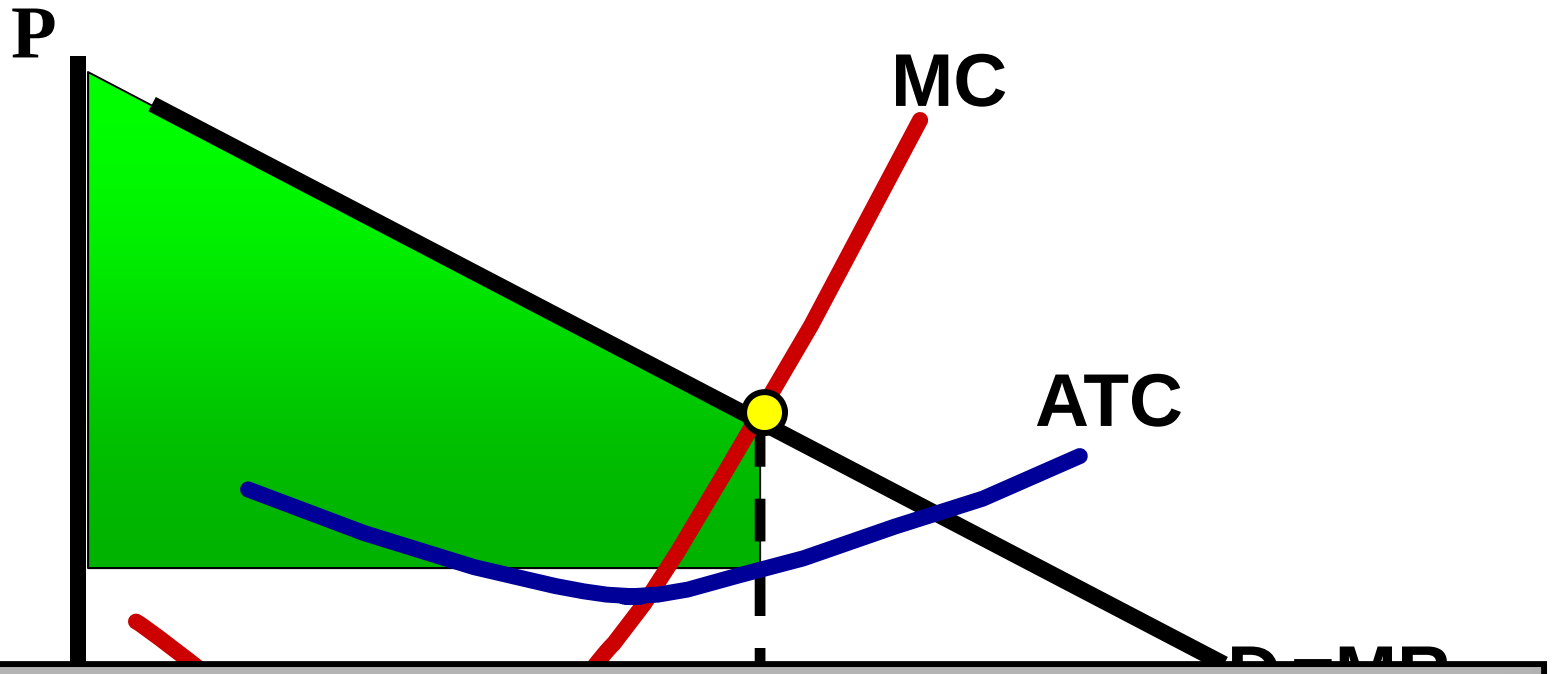
A perfectly discriminating can charge each person differently so the Marginal Revenue = Demand

Identify the Price, Profit, CS, and DWL



A perfectly discriminating can charge each person differently so the Marginal Revenue = Demand

Identify the Price, Profit, CS, and DWL



Price Discrimination results in several prices, more profit, no CS, and a higher socially optimal quantity

Monopolistic Competition

Characteristics of Monopolistic Competition:

- **Relatively Large Number of Sellers**
- **Differentiated Products**
- **Some control over price**
- **Easy Entry and Exit (Low Barriers)**
- **A lot of non-price competition (Advertising)**

“Monopoly” + ”Competition”

Monopolistic Qualities

- Control over price of own good due to differentiated product
- D greater than MR
- Plenty of Advertising
- Not efficient

Perfect Competition Qualities

- Large number of smaller firms
- Relatively easy entry and exit
- Zero Economic Profit in Long-Run since firms can enter

Differentiated Products

- Goods are NOT identical.
- Firms seek to capture a piece of the market by making unique goods.
- Since these products have substitutes, firms use NON-PRICE Competition.

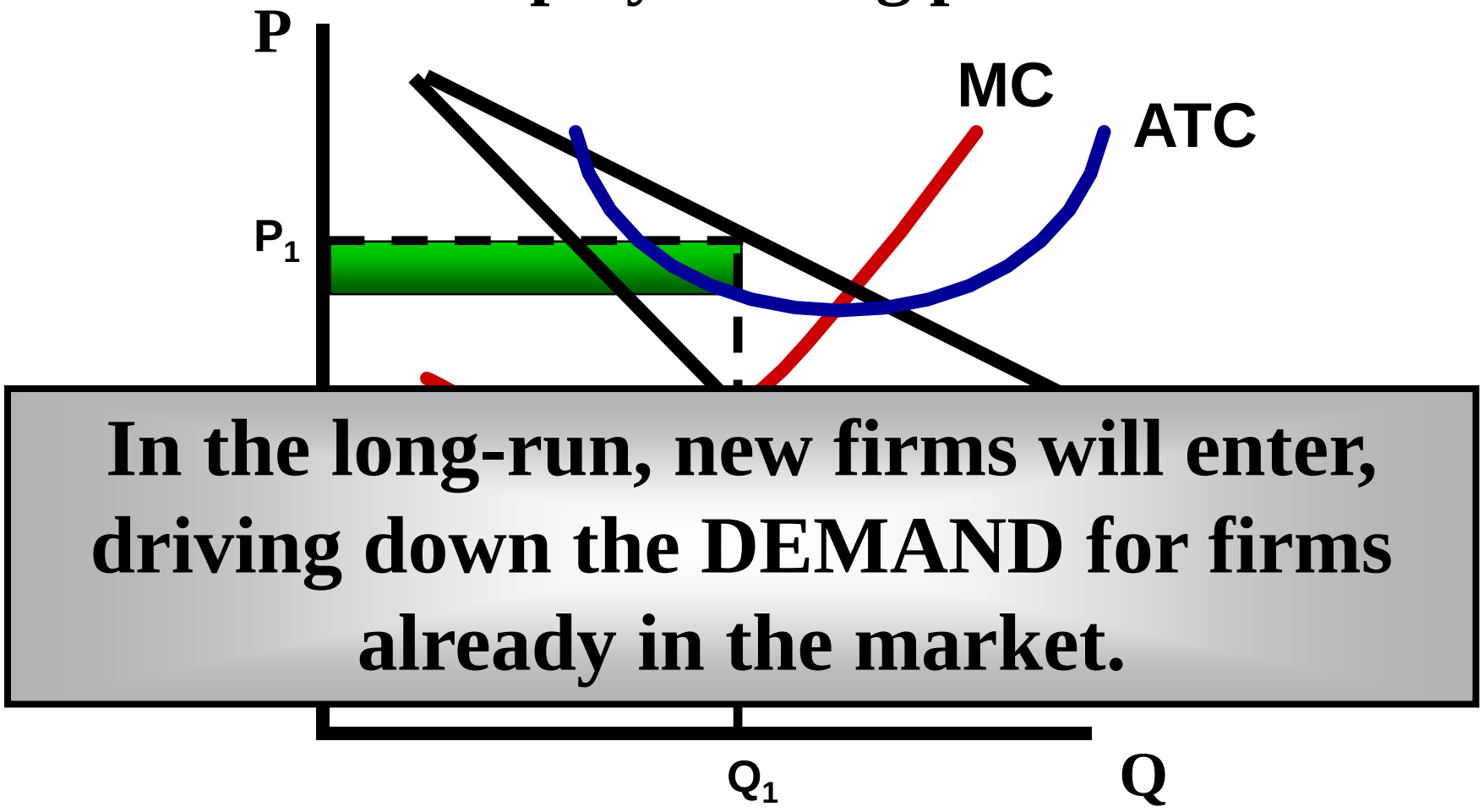
Examples of NON-PRICE Competition

- Brand Names and Packaging
- Product Attributes
- Service
- Location
- Advertising (Two Goals)
  1. Increase Demand
  2. Make demand more INELASTIC

Drawing Monopolistic Competition

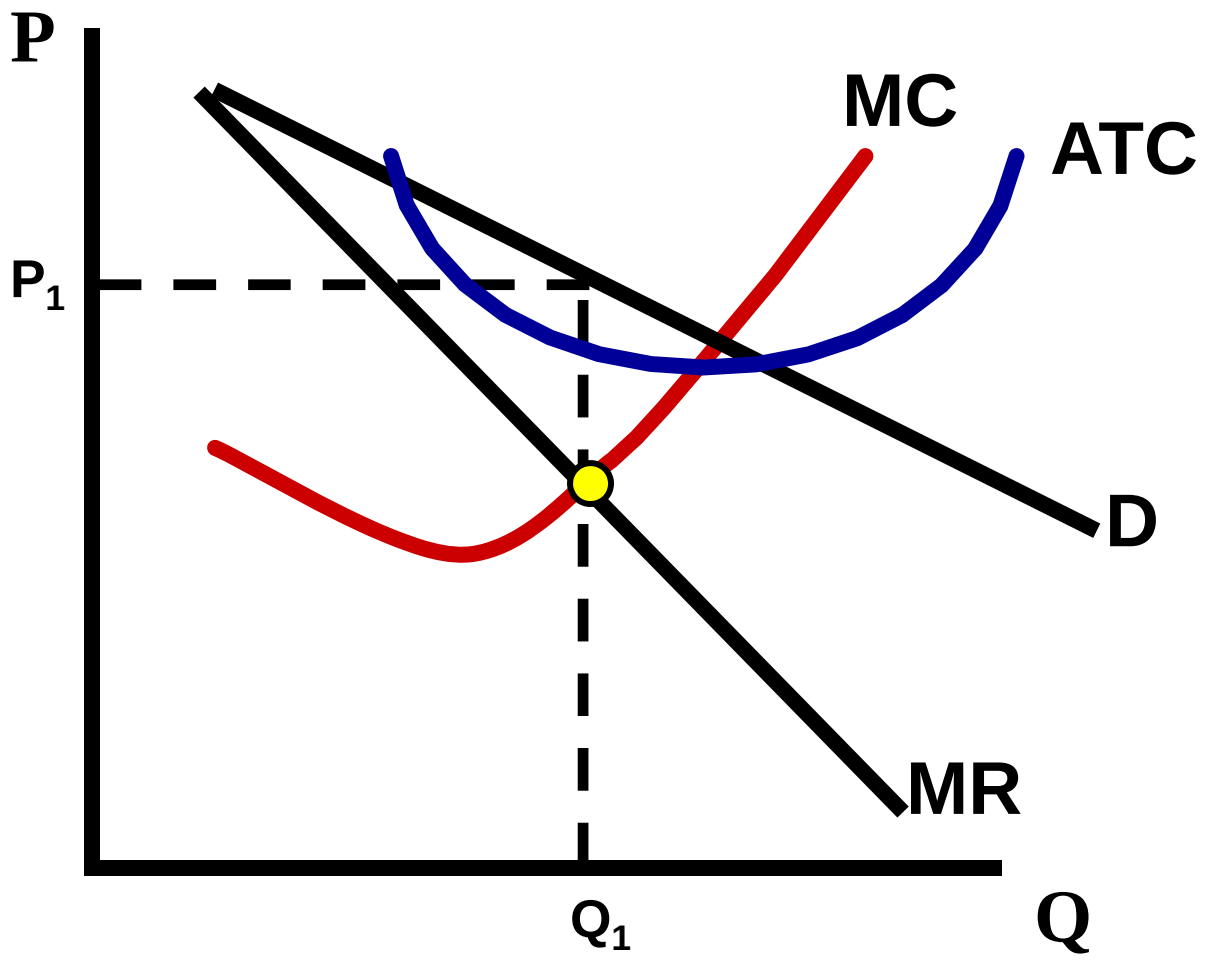
Monopolistic Competition is made up of prices makers so MR is less than Demand

In the short-run, it is the same graph as a monopoly making profit



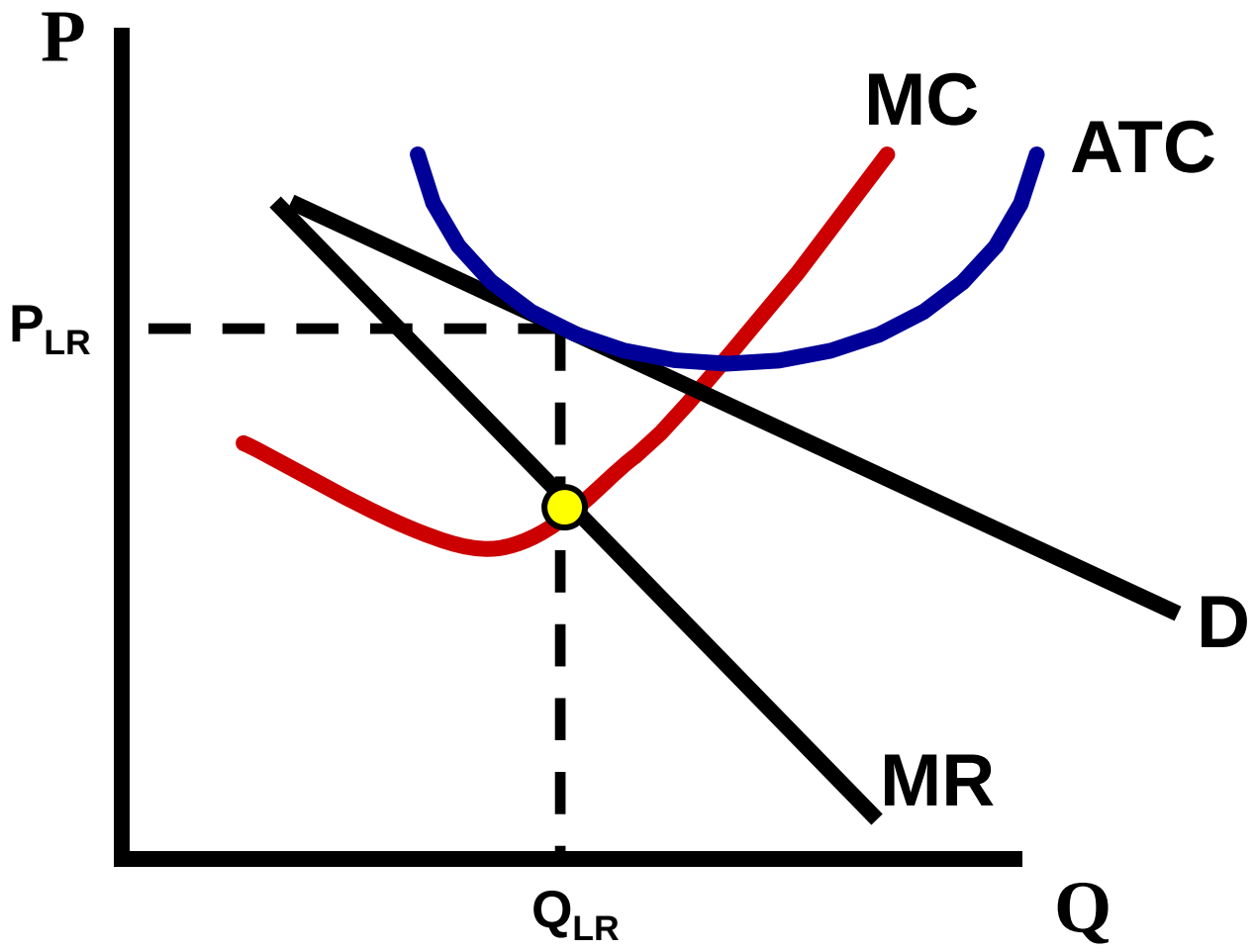
In the long-run, new firms will enter, driving down the DEMAND for firms already in the market.

Firms enter so demand falls until there is no economic profit



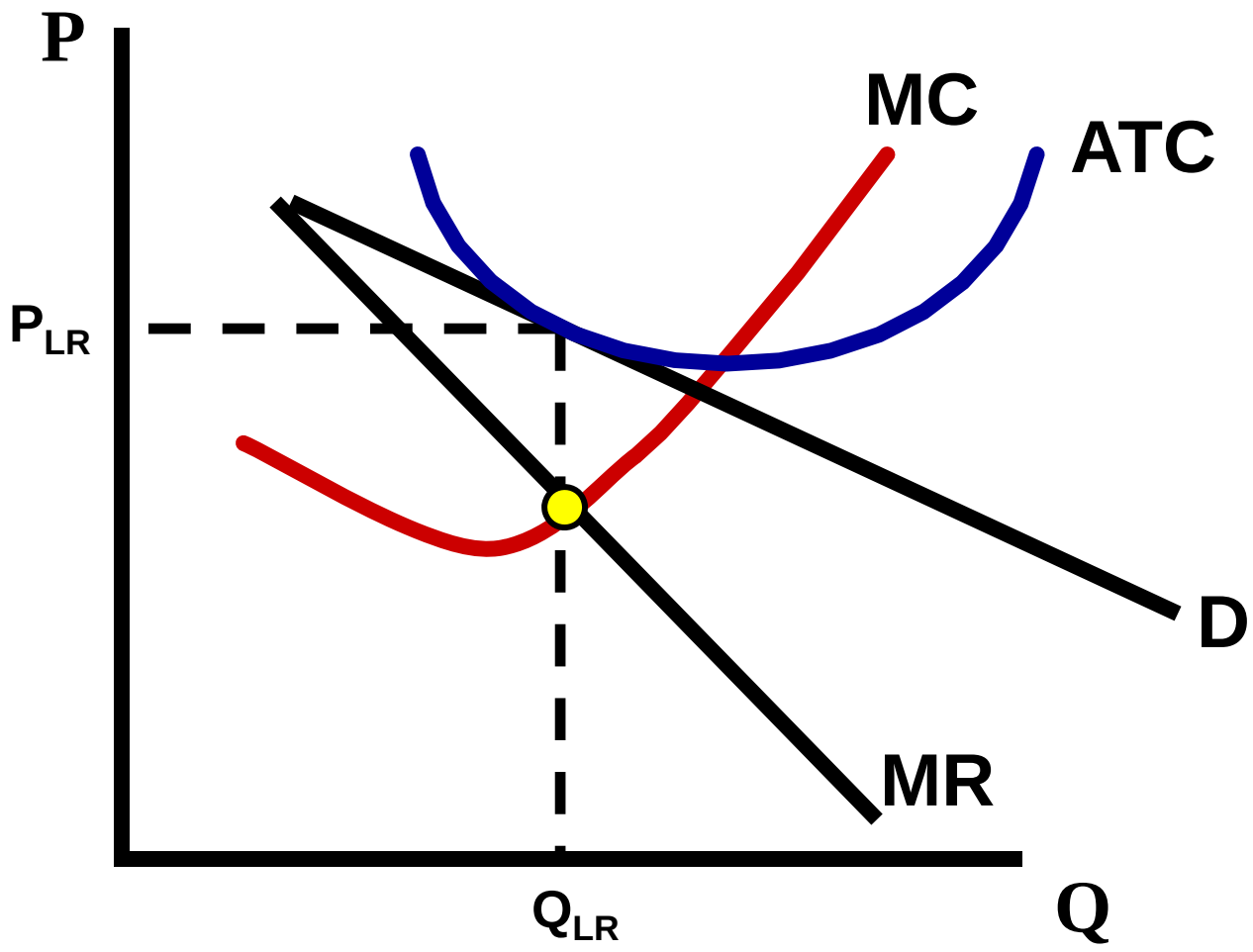
Firms enter so demand falls until there is no economic profit

Price and quantity falls and TR=TC



LONG-RUN EQUILIBRIUM

Quantity where MR =MC up to Price = ATC



Why does DEMAND shift?

When short-run profits are made…

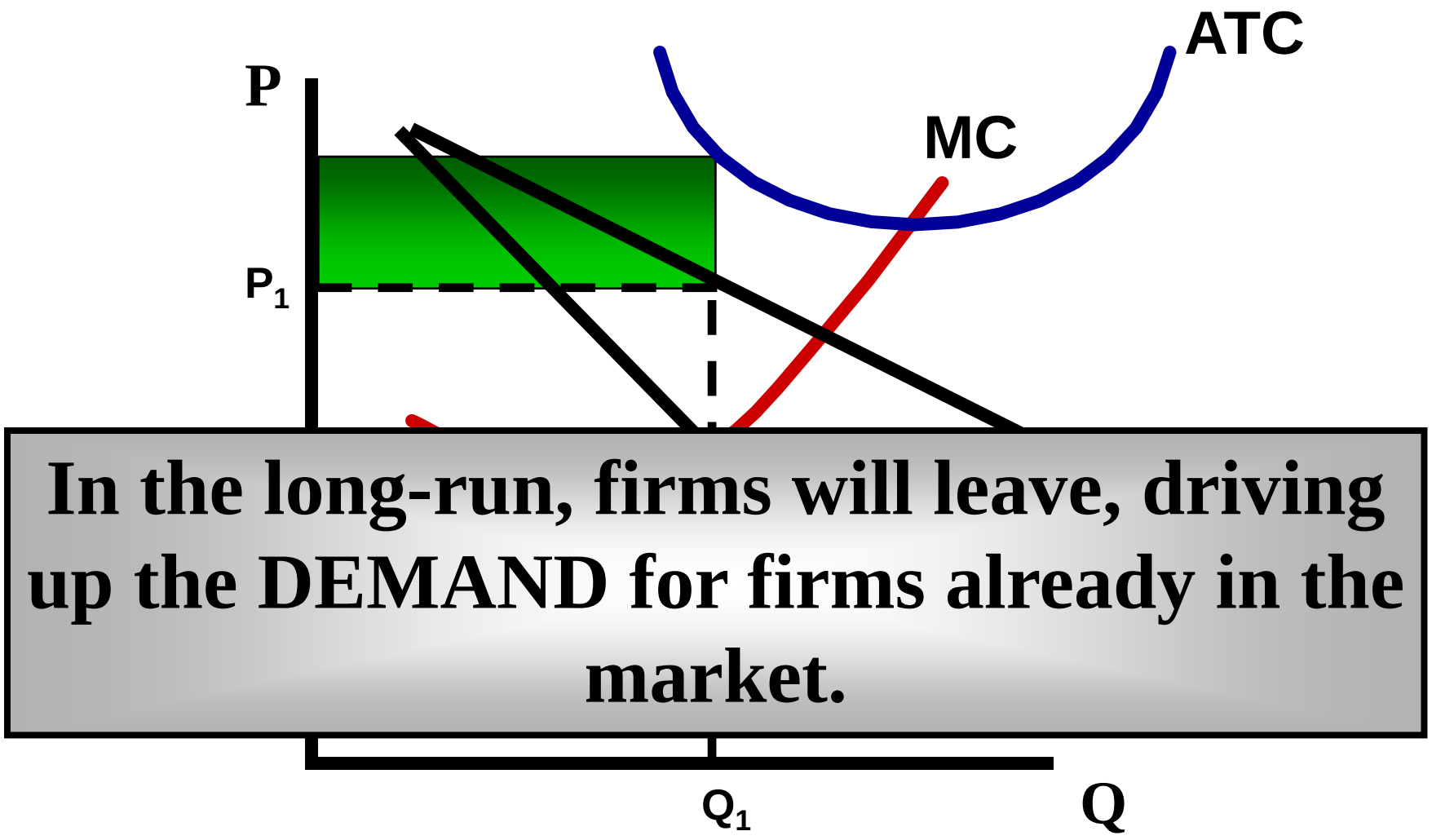
- New firms enter.
- New firms mean more close substitutes and less market shares for each existing firm.
- Demand for each firm falls.

When short-run losses are made…

- Firms exit.
- Result is less substitutes and more market shares for remaining firms.
- Demand for each firm rises.

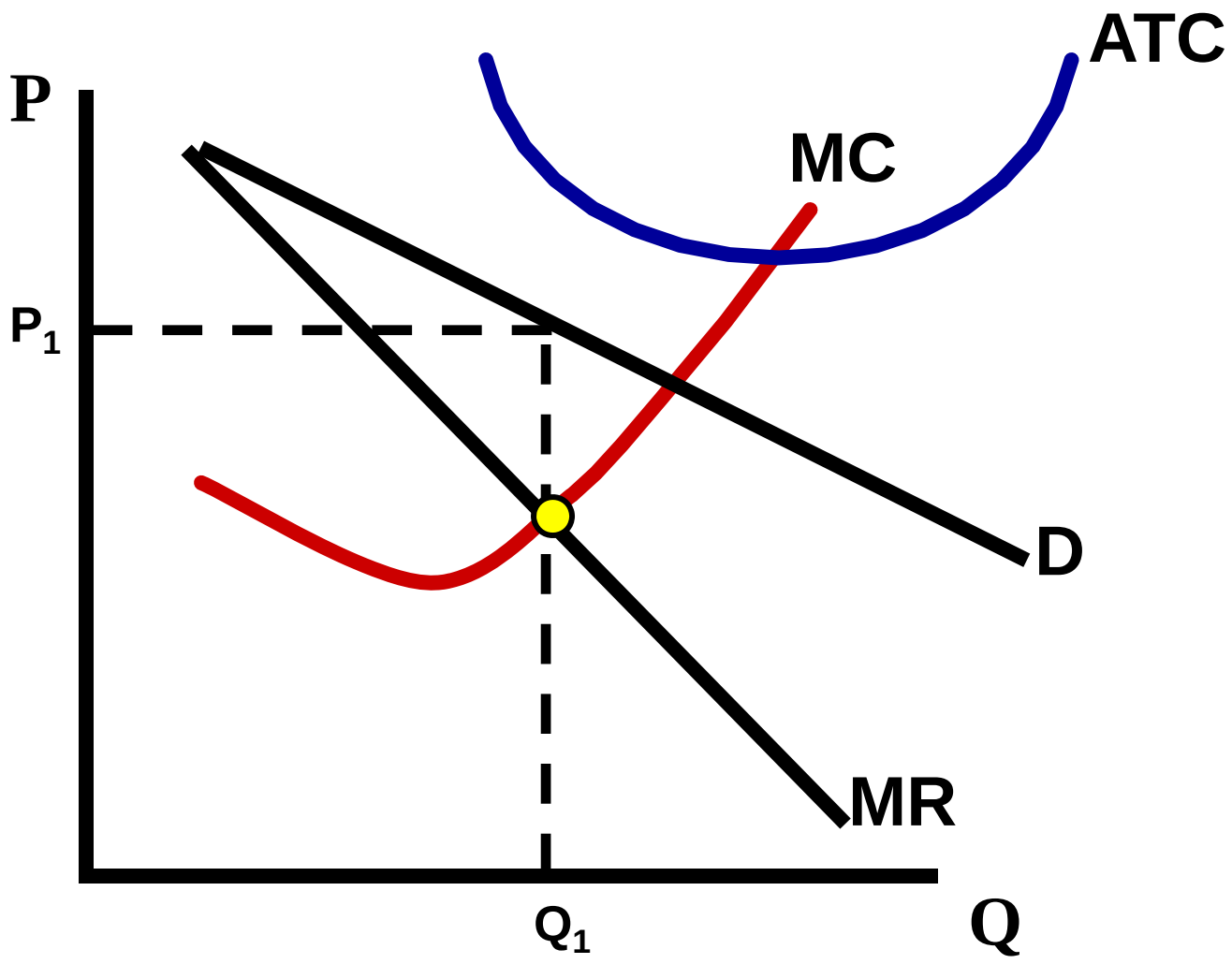
What happens when there is a loss?

In the short-run, the graph is the same as a monopoly making a loss



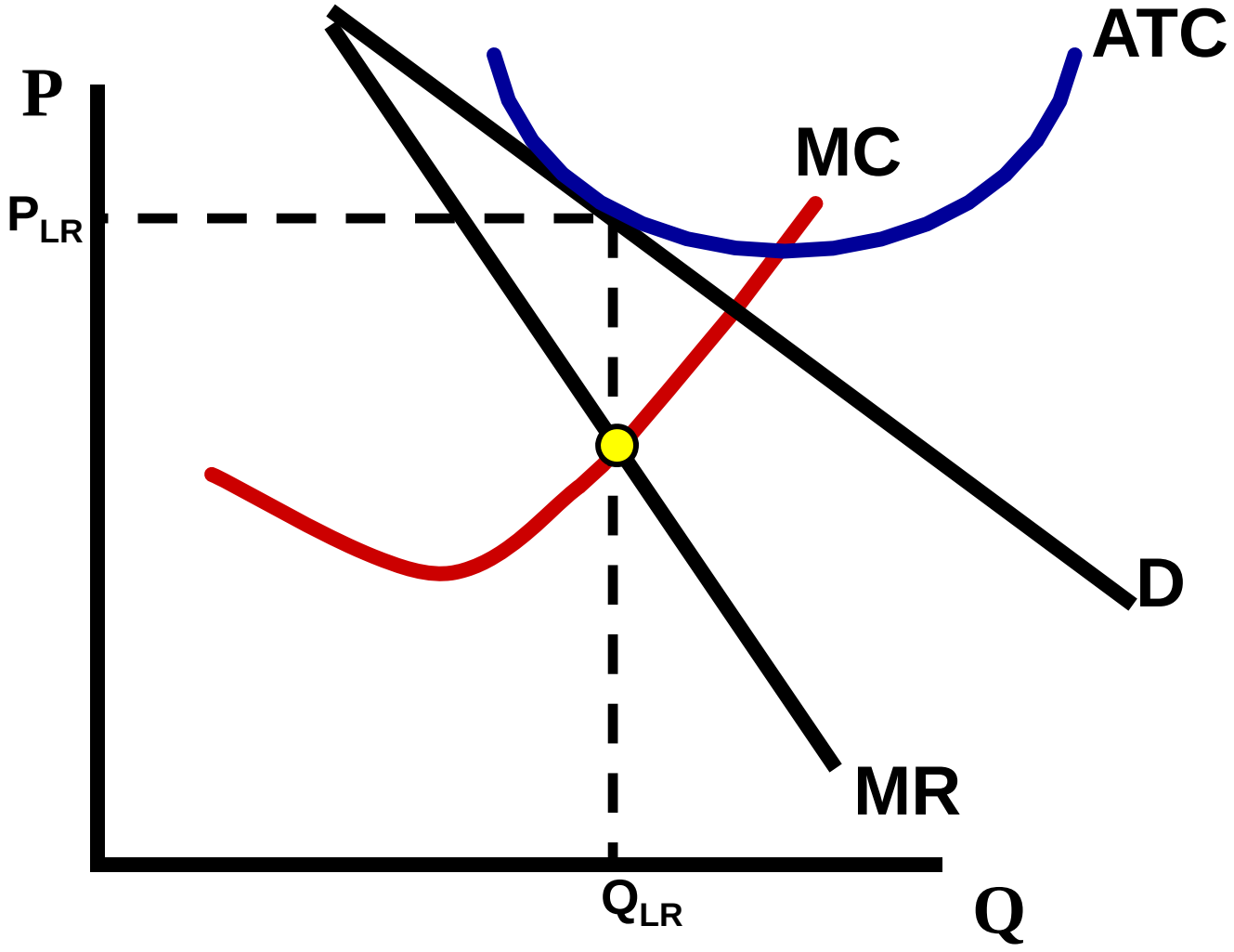
In the long-run, firms will leave, driving up the DEMAND for firms already in the market.

Firms leave so demand increases until there is no economic profit



Firms leave so demand increases until there is no economic profit

Price and quantity increase and TR=TC

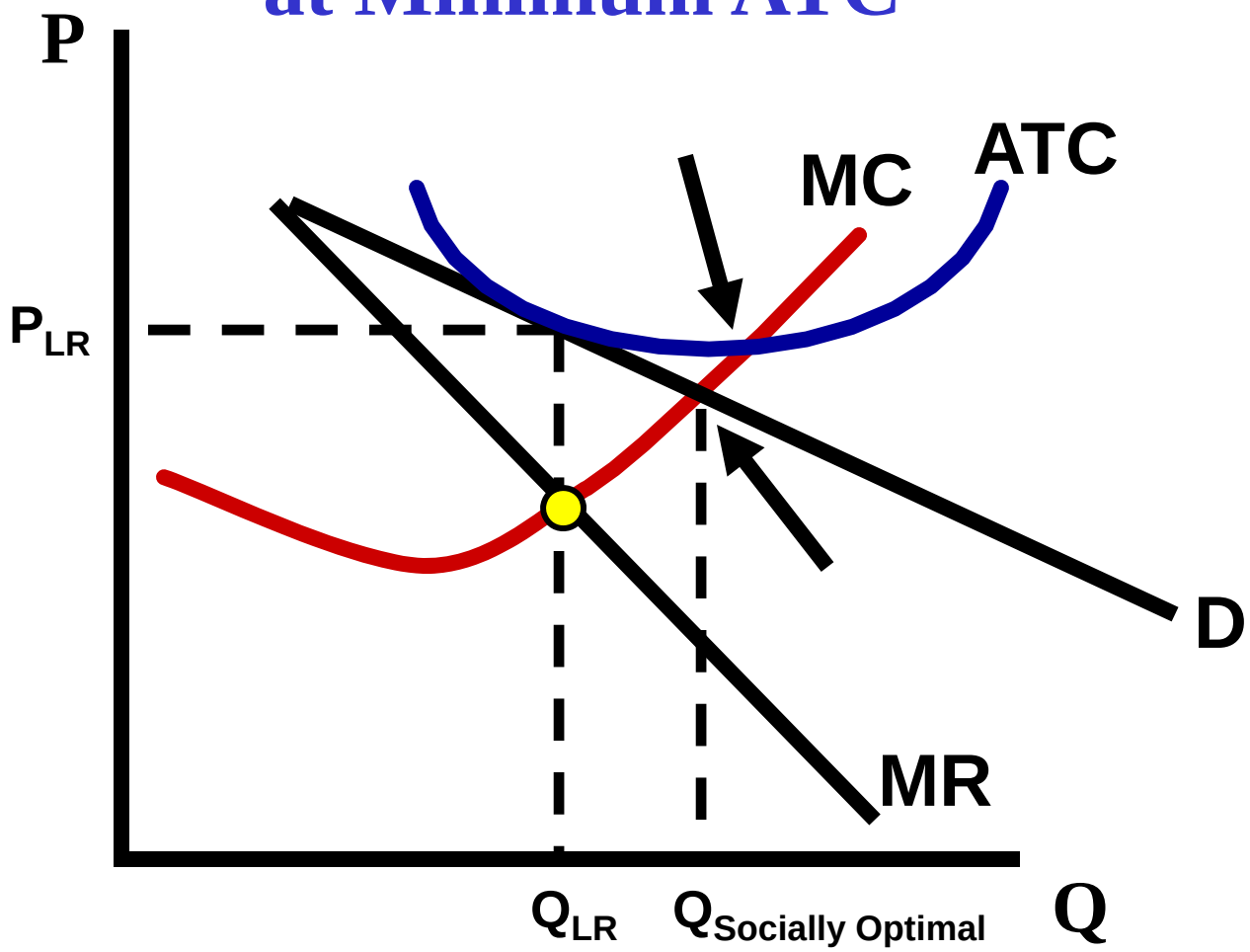


Are Monopolistically Competitive Firms Efficient?

LONG-RUN EQUILIBRIUM

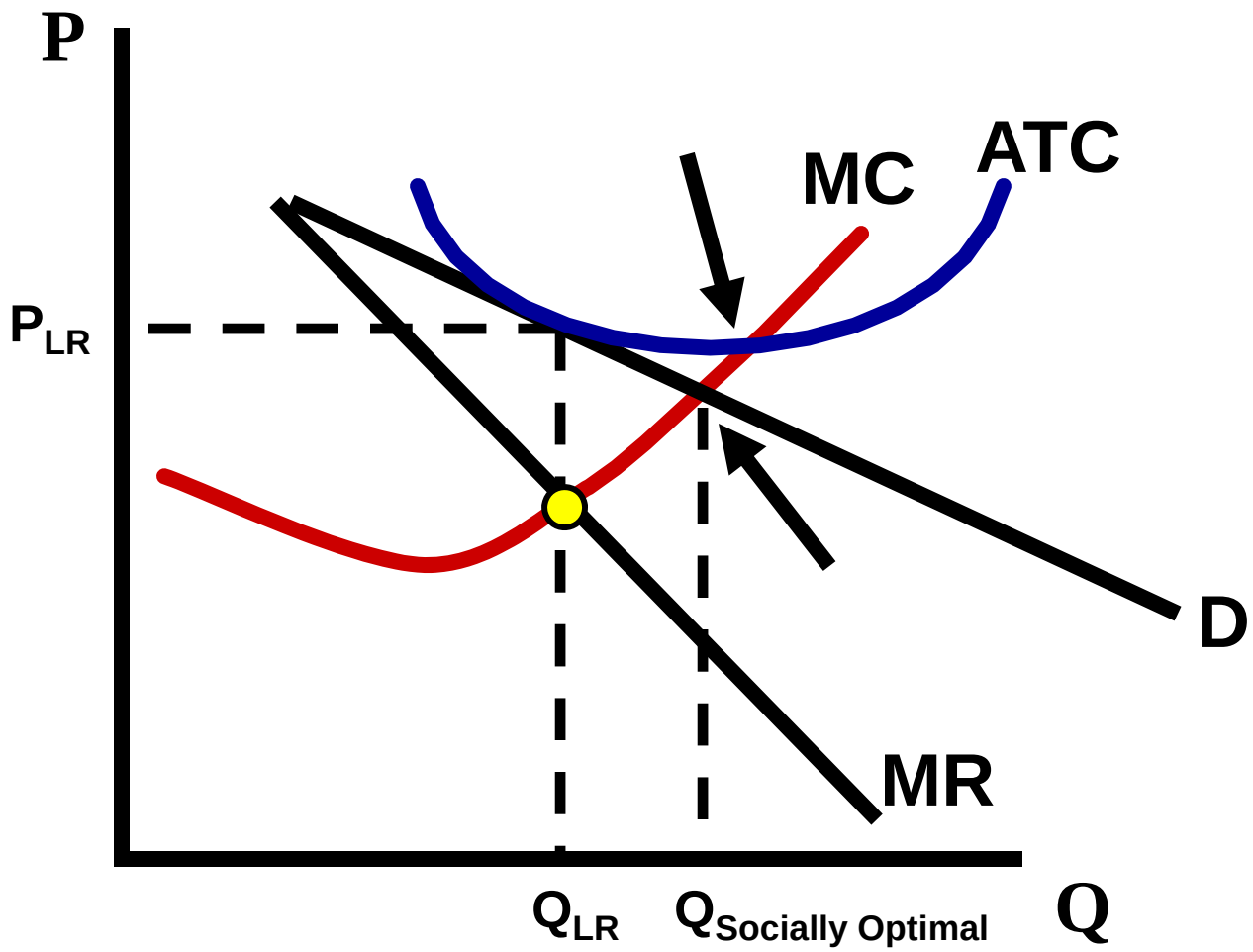
Not Allocatively Efficient because P ≠ MC

Not Productively Efficient because not producing at Minimum ATC



LONG-RUN EQUILIBRIUM

This firm also has EXCESS CAPACITY

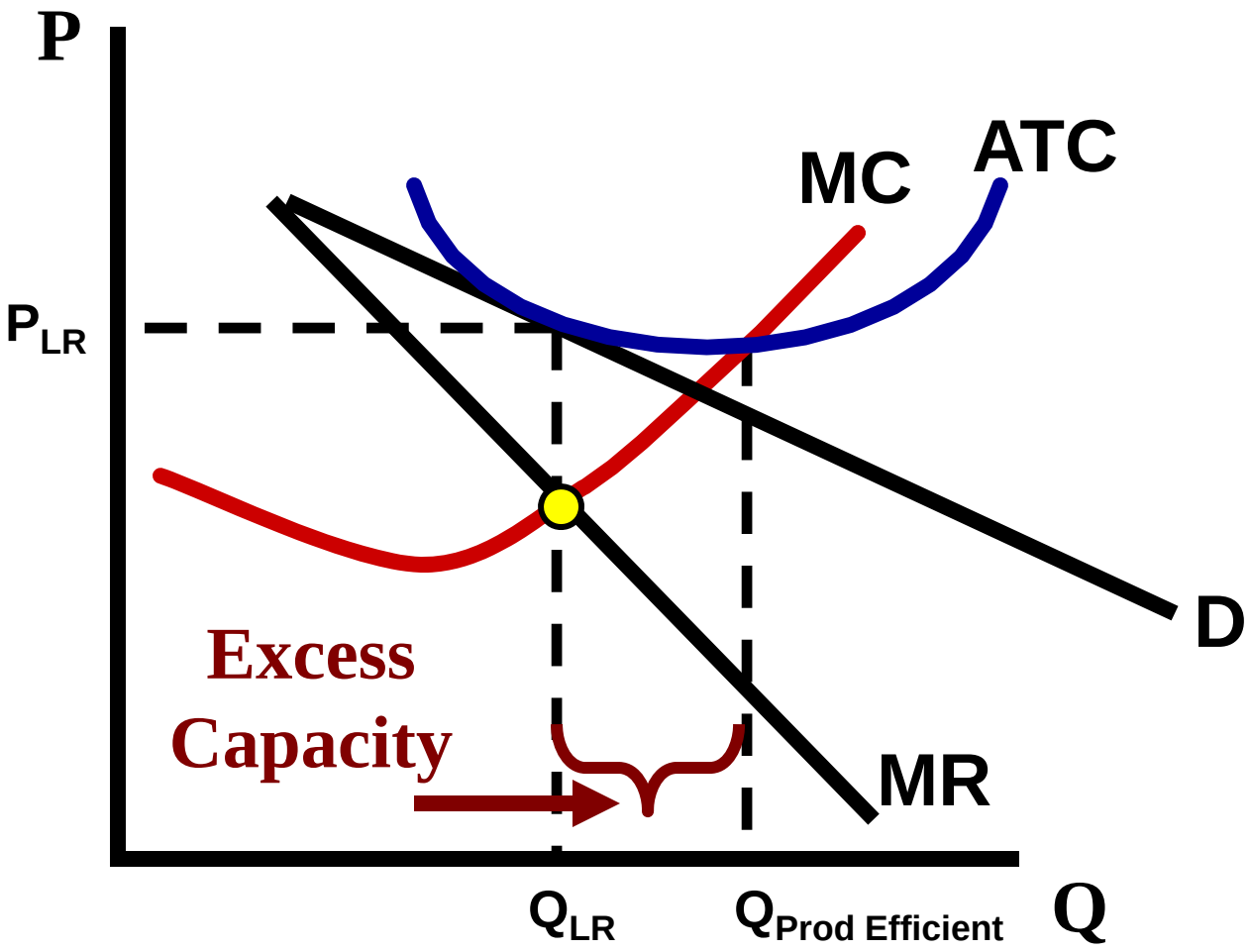


Excess Capacity

- **Given current resources, the firm can produce at the lowest costs (minimum ATC) but they decide not to.**
- **The gap between the minimum ATC output and the profit maximizing output.**
- **Not the amount underproduced**

LONG-RUN EQUILIBRIUM

The firm can produce at a lower cost but it holds back production to maximize profit



Practice Question

Assume there is a monopolistically competitive firm in long-run equilibrium. If this firm were to realize productive efficiency, it would:

A) have more economic profit.

B) have a loss.

C) also achieve allocative efficiency.

D) be under producing.

E) be in long-run equilibrium.

Advantages of MONOPOLISTIC COMPETITION

- **Large number of firms and product variation meets societies needs.**
- **Nonprice Competition (product differentiation and advertising) may result in sustained profits for some firms.**

Ex: Nike might continue to make above normal profit because they are a well known brand.

Oligopoly

FOUR MARKET MODELS

Characteristics of Oligopolies:

- A Few Large Producers (Less than 10)
- Identical or Differentiated Products
- High Barriers to Entry
- Control Over Price (Price Maker)
- Mutual Interdependence
  - Firms use Strategic Pricing

Examples: OPEC, Cereal Companies, Car Producers

HOW DO OLIGOPOLIES OCCUR?

Oligopolies occur when only a few large firms start to control an industry.

High barriers to entry keep others from entering.

Types of Barriers to Entry

1. Economies of Scale

- **Ex: The car industry is difficult to enter because only large firms can make cars at the lowest cost**

2. High Start-up Costs

3. Ownership of Raw Materials

Game Theory

The study of how people behave in strategic situations

An understanding of game theory helps firms in an oligopoly maximize profit.

Game theory helps predict human behavior

THE ICE CREAM MAN SIMULATION

1. You are a ice cream salesmen at the beach
2. You have identical prices as another salesmen.
3. Beachgoers will purchase from the closest salesmen
4. People are evenly distributed along the beach.
5. Each morning the two firms pick locations on the beach

Where is the best location?

Why learn about game theory?

- **Oligopolies are interdependent since they compete with only a few other firms.**
- **Their pricing and output decisions must be strategic as to avoid economic losses.**
- **Game theory helps us analyze their strategies.**

SIMULATION!

Game Theory Matrix

You and your partner are competing firms. You have one of two choices: Price High or Price Low.

Without talking, write down your choice

		Firm 2	
		High	**Low**
Firm 1	**High**	**Both High = $20 Each**	**Low = $30 High = 0**
	Low	**High = 0 Low = $30**	**Both Low= $10 each**

Game Theory Matrix

Notice that you have an incentive to collude but also an incentive to cheat on your agreement

Firm 1 \ Firm 2	High	Low
High	**Both High = $20 Each**	**Low = $30 High = 0**
Low	**High = 0 Low = $30**	**Both Low= $10 each**

Dominant Strategy

The Dominant Strategy is the best move to make regardless of what your opponent does

What is each firm's dominate strategy?

No Dominant Strategy

Firm 1 \ Firm 2	High	Low
High	**$100, $50**	**$50, $90**
Low	**$80, $40**	**$20, $10**

Video: Split or Steal

What is each player's dominate strategy?

		Firm 2: Split	Firm 2: Steal
Firm 1	Split	Half, Half	None, All
Firm 1	Steal	All, None	None, None

What did we learn?

1. **Oligopolies must use strategic pricing (they have to worry about the other guy)**
2. **Oligopolies have a tendency to collude to gain profit.**
   (Collusion is the act of cooperating with rivals in order to "rig" a situation)
3. **Collusion results in the incentive to cheat.**
4. **Firms make informed decisions based on their dominant strategies**

2007 FRQ #3

Payoff matrix for two competing bus companies

		Rankin Wheels: Early	Rankin Wheels: Late
Roadway	Early	\$1,000, \$900	\$950, \$850
Roadway	Late	\$750, \$650	\$700, \$800

(a) In which market structure do these firms operate? Explain.

(b) If Roadway chooses an early departure, which departure time is better for Rankin Wheels?

(c) Identify the dominant strategy for Roadway.

(d) Is choosing an early departure a dominant strategy for Rankin Wheels? Explain.

(e) If both firms know all of the information in the payoff matrix but do not cooperate, what will be Rankin Wheels' daily profit?

2009 FRQB #3

Payoff matrix for two competing bus companies

		City Wheels: Maintain Fare	City Wheels: Lower Fare
Easy Ride	Maintain Fare	\$150, \$180	\$130, \$120
	Lower Fare	\$120, \$130	\$140, \$110

(a) If Easy Ride chooses to maintain its current fare, which strategy is better for City Wheels? Explain.

(b) Is there a dominant strategy for Easy Ride? Explain.

(c) Assume that the companies must make their decisions simultaneously and do not cooperate. What will be the daily profit for each firm?

(d) If these two firms could cooperate, which strategy would each firm choose?

(e) Suppose that the local government decides to provide a subsidy of \$40 per day to the bus companies. However, only a company that agrees to lower its fare is eligible to receive the subsidy. Draw a new payoff matrix to reflect the change in government policy.

Oligopoly Graphs

Because firms are interdependent

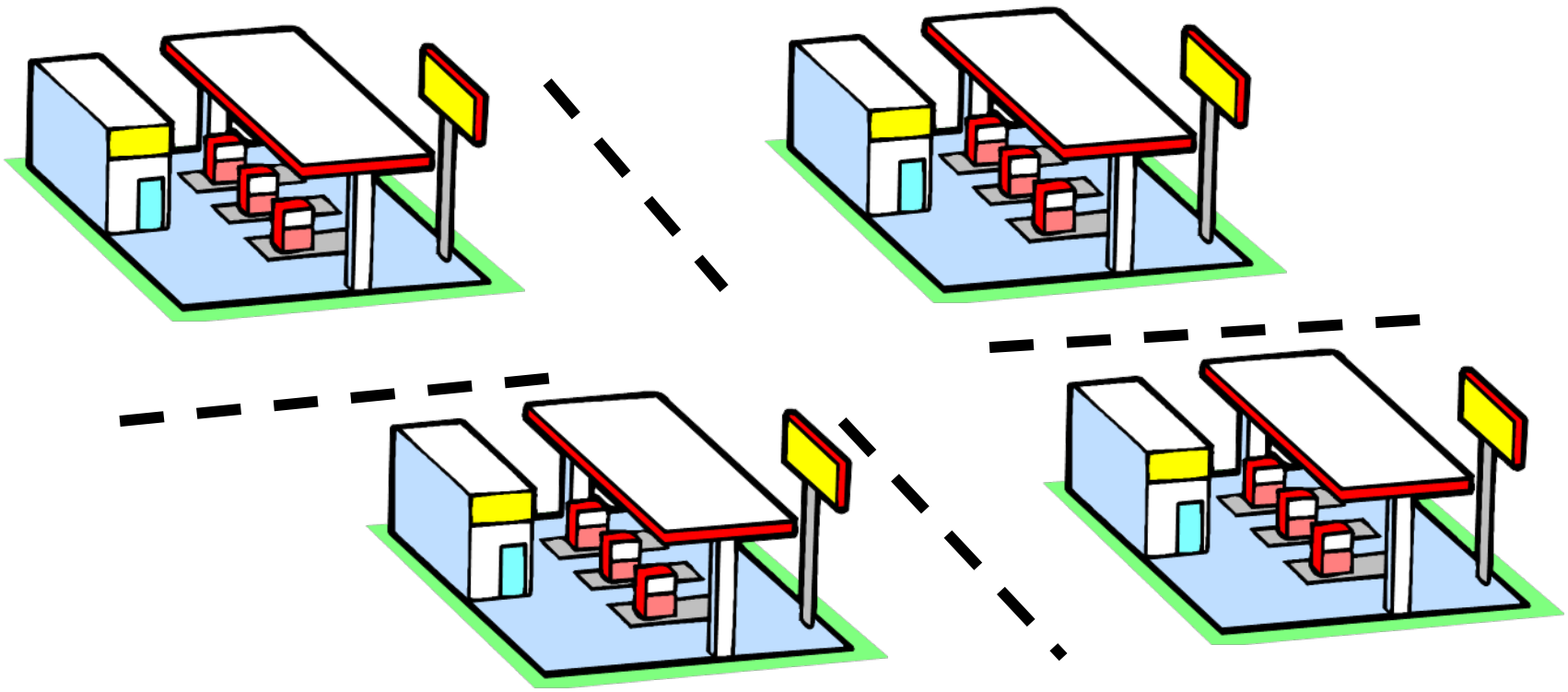
There are 3 types of Oligopolies

1. **Price Leadership (no graph)**
2. **Colluding Oligopoly**
3. **Non Colluding Oligopoly**

#1. Price Leadership

Example: Small Town Gas Stations

To maximize profit what will they do?



PRICE LEADERSHIP MODEL

- **Collusion is ILLEGAL.**
- **Firms CANNOT set prices.**
- **Price leadership is a strategy used by firms to coordinate prices without outright collusion**

General Process:

1. **“Dominant firm” initiates a price change**
2. **Other firms follow the leader**

PRICE LEADERSHIP MODEL

Breakdowns in Price Leadership

- **Temporary Price Wars may occur if other firms don't follow price increases of dominant firm.**
- **Each firm tries to undercut each other.**

Example: Employee Pricing for Ford

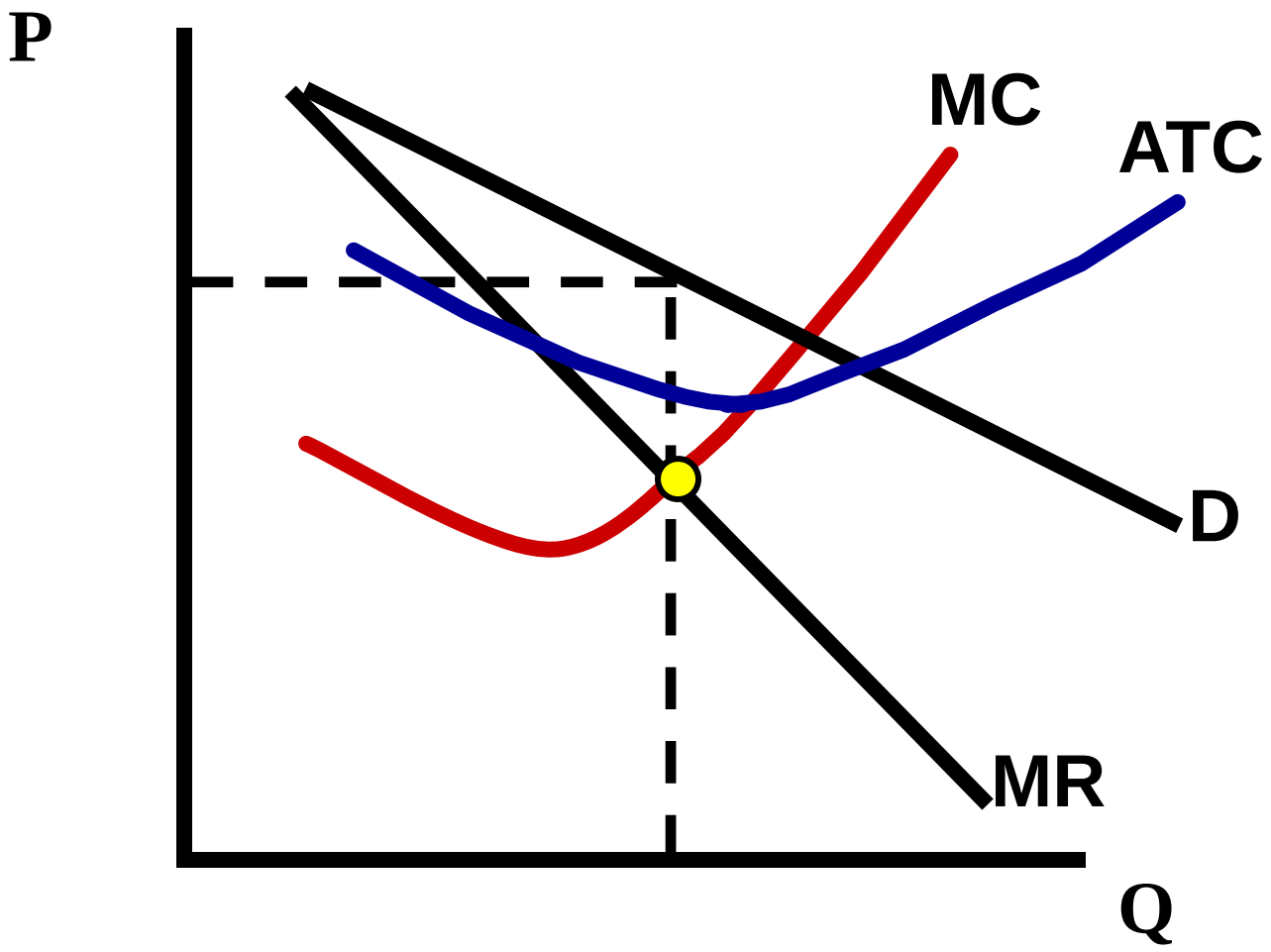
#2. Colluding Oligopolies

Cartel = Colluding Oligopoly

A cartel is a group of producers that create an agreement to fix prices high.

1. **Cartels set price and output at an agreed upon level**
2. **Firms require identical or highly similar demand and costs**
3. **Cartel must have a way to punish cheaters**
4. **Together they act as a monopoly**

Firms in a colluding oligopoly act as a monopoly and share the profit



#3. Non-Colluding Oligopolies

Kinked Demand Curve Model

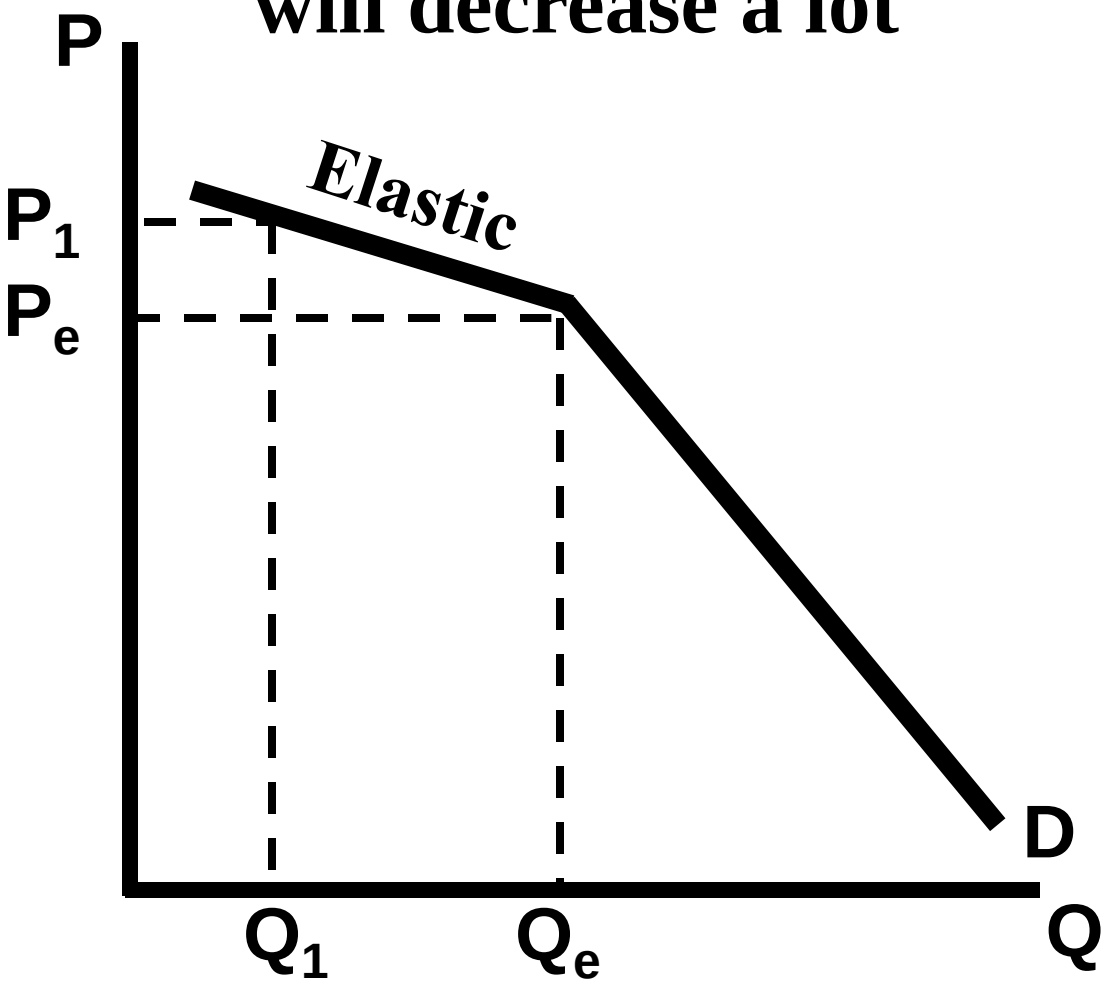
The kinked demand curve model shows how noncollusive firms are interdependent

If firms are NOT colluding they are likely to react to competitor's pricing in two ways:

1. **Match price-If one firm cuts it's prices, then the other firms follow suit causing inelastic demand**
2. **Ignore change-If one firm raises prices, others maintain same price causing elastic demand**

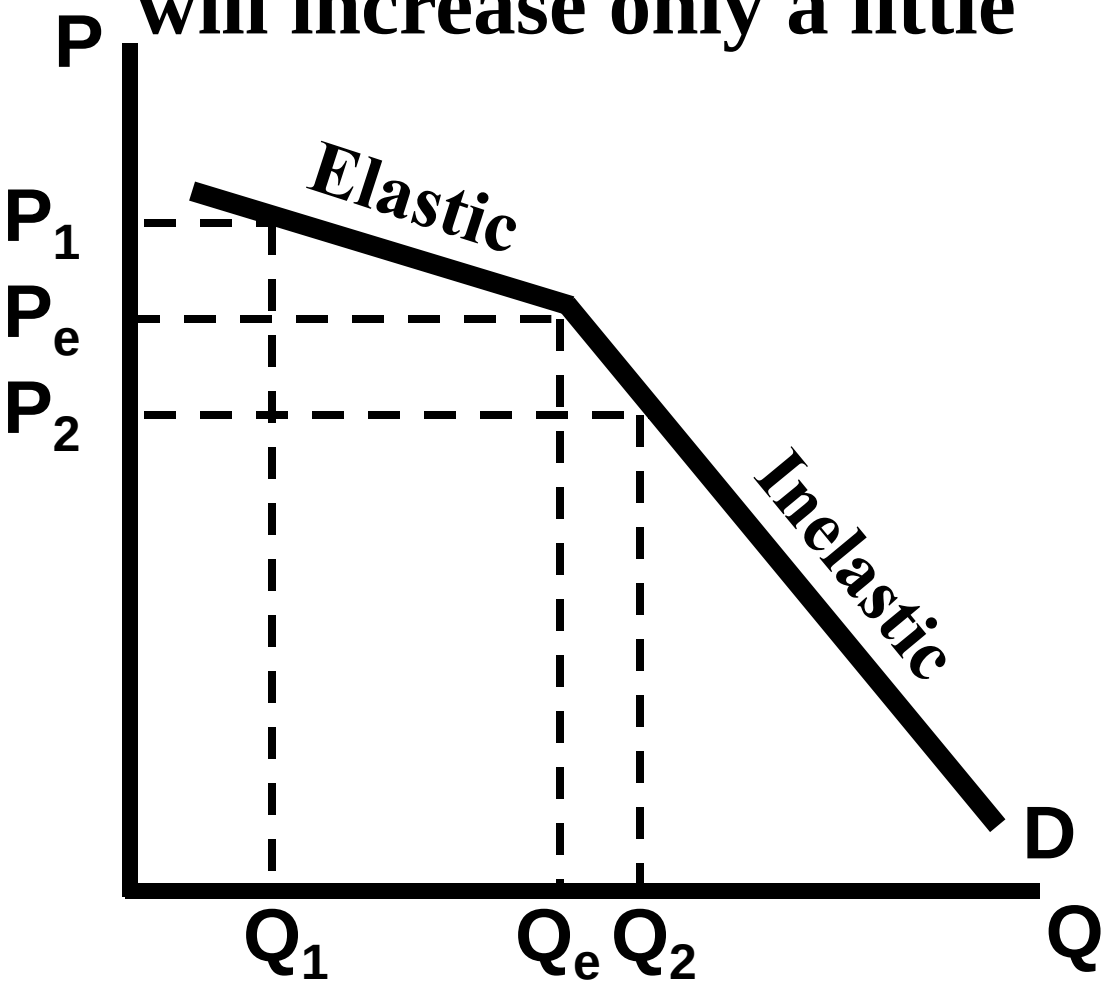
If this firm increases it's price, other firms will ignore it and keep prices the same

As the only firm with high prices, Qd for this firm will decrease a lot



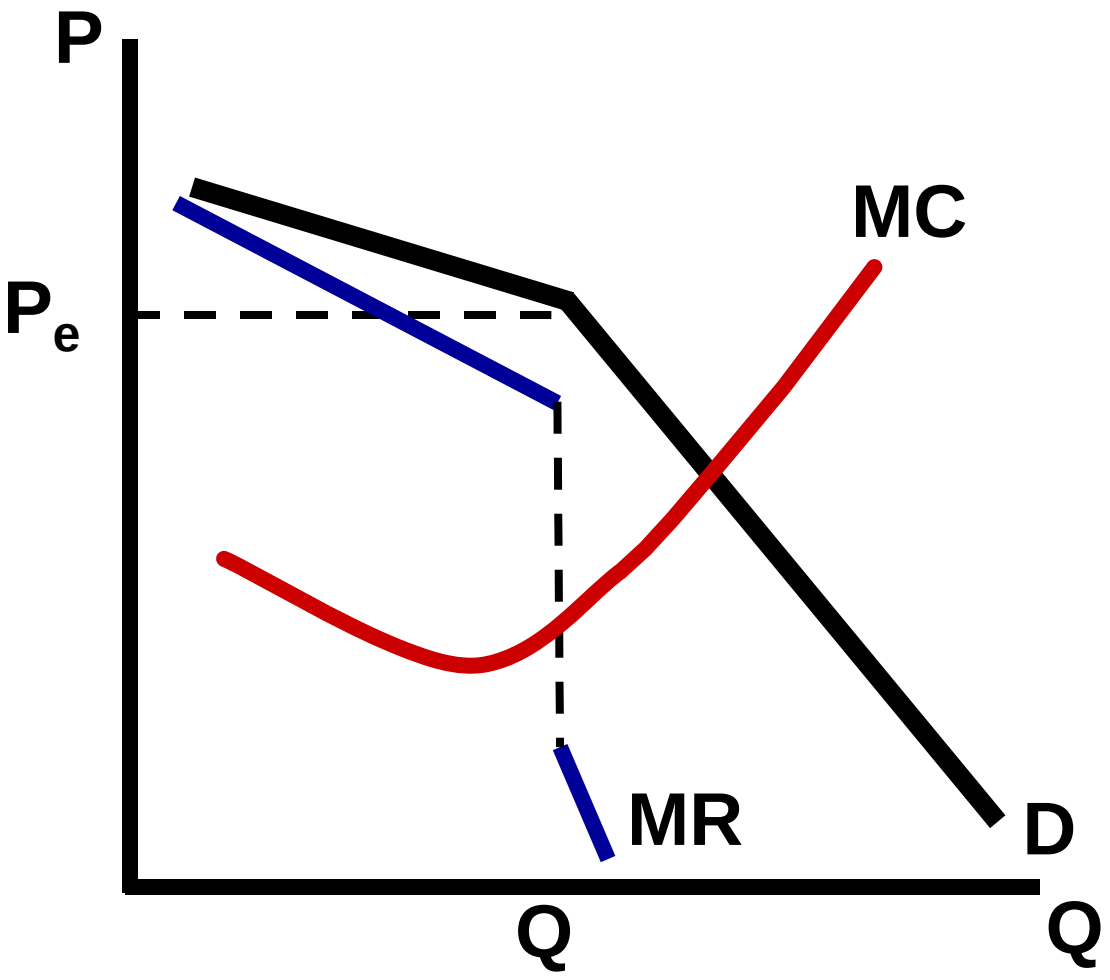
If this firm decreases it's price, other firms will match it and lower their prices

Since all firms have lower prices, Qd for this firm will increase only a little

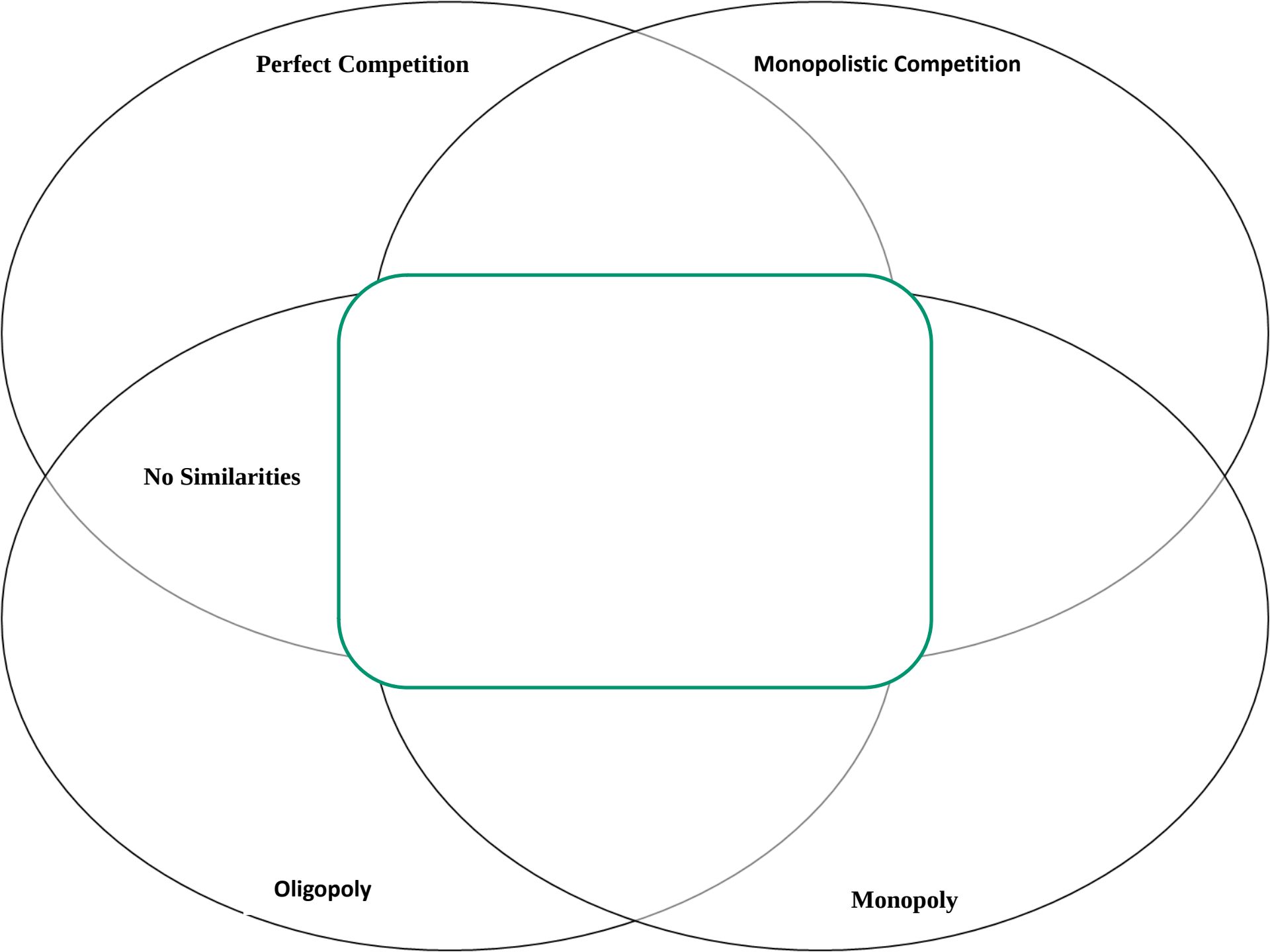


Where is Marginal Revenue?

MR has a vertical gap at the kink. The result is that MC can move and Q_e won't change. Price is sticky.

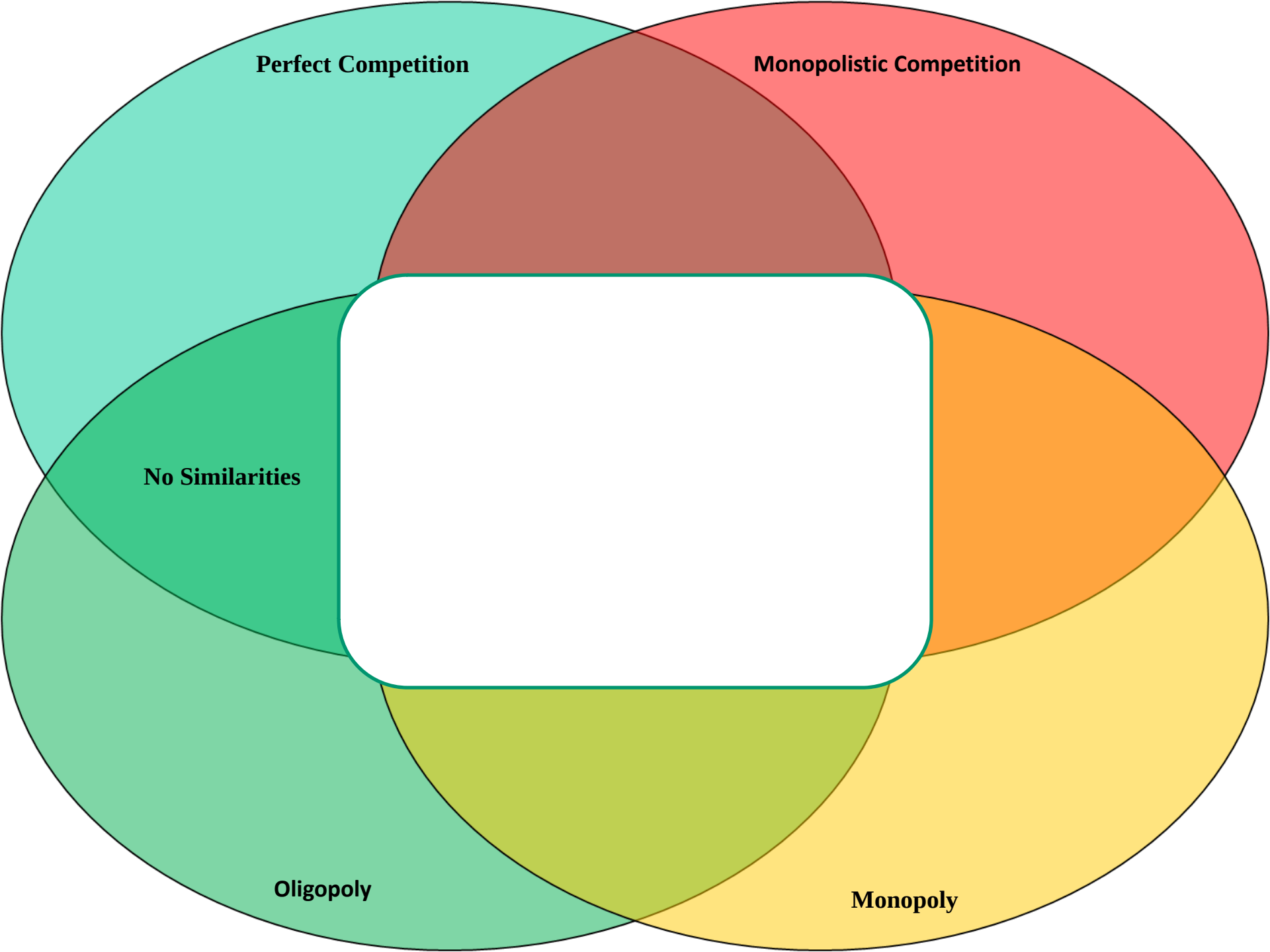


Market Structures Venn Diagram


Perfect Competition
Monopolistic Competition
No Similarities
Oligopoly
Monopoly

Name the market structure(s) that it is associated with each concept

1. Price Maker (Demand > MR)
2. Collusion/Cartels
3. Identical Products
4. Price Taker (Demand = MR)
5. Excess Capacity
6. Low Barriers to Entry
7. Game Theory
8. Differentiated Products
9. Long-run Profits
10. Efficiency
11. Normal Profit
12. Dead Weight Loss
13. High Barriers to Entry
14. Firm = Industry
15. MR=MC Rule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Monopolistic Competition
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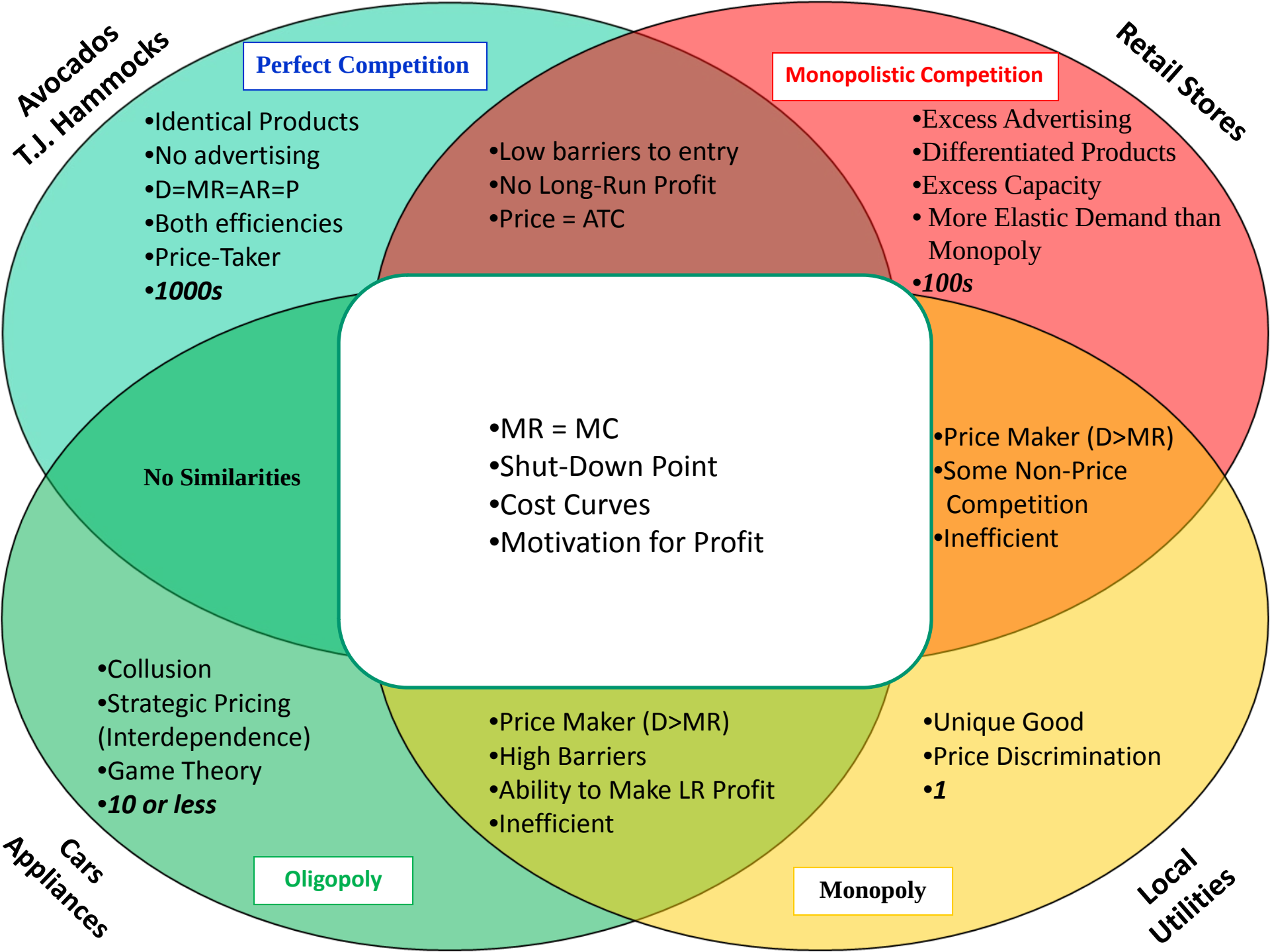
Avocados
T.J. Hammocks
Perfect Competition
•Identical Products
•No advertising
•D=MR=AR=P
•Both efficiencies
•Price-Taker
•1000s
Retail Stores
Monopolistic Competition
•Excess Advertising
•Differentiated Products
•Excess Capacity
• More Elastic Demand than Monopoly
•100s
•Low barriers to entry
•No Long-Run Profit
•Price = ATC
•MR = MC
•Shut-Down Point
•Cost Curves
•Motivation for Profit
No Similarities
•Price Maker (D>MR)
•Some Non-Price Competition
•Inefficient
•Collusion
•Strategic Pricing (Interdependence)
•Game Theory
•10 or less
Cars
Appliances
Oligopoly
•Price Maker (D>MR)
•High Barriers
•Ability to Make LR Profit
•Inefficient
Monopoly
•Unique Good
•Price Discrimination
•1
Local Utilities