Recitation 11 (Section 010)

Pranay Gundam

November 18, 2026

University of Minnesota

Please scan the QR code and fill out the attendance form!



Today's Agenda

- Announcements
- ICA
- Monopoly Review

Announcements

- Congrats on finishing Midterm 2!
- We have another debate coming up in 3 weeks.
- Experiment in two weeks.

Why monopolies arise

What is a monopoly?

Monopoly: the *only* seller of a product with no close substitutes.

- It has **market power**: it is a **price maker**, not a price taker.
- It stays a monopoly because of **barriers to entry**: other firms can't come in.

Barrier	**What it means**	**Example**
Key resource	One firm owns a needed input	DeBeers diamonds
Government	Exclusive right to produce	Patents, copyright
Natural monopoly	One firm supplies the market at lower ATC than several	Water, electricity

Natural monopoly: huge fixed cost, small MC, so ATC **keeps falling** over the relevant range of output (economies of scale).

Definitions check: sources of monopoly

Where does each firm's market power come from: a key resource, the government, or a natural monopoly?

1. A pharmaceutical company with a 20-year patent on a new drug.
2. The company that runs the water pipes in Minneapolis.
3. A firm that owns the only quarry of a rare stone.
4. The publisher of the *Hunger Games* books.
5. A small town's power company: one firm serving 1,000 homes has lower ATC than two firms serving 500 each.

Definitions check: sources of monopoly

Where does each firm's market power come from: a key resource, the government, or a natural monopoly?

1. A pharmaceutical company with a 20-year patent on a new drug.
2. The company that runs the water pipes in Minneapolis.
3. A firm that owns the only quarry of a rare stone.
4. The publisher of the *Hunger Games* books.
5. A small town's power company: one firm serving 1,000 homes has lower ATC than two firms serving 500 each.

Answer: 1. government (patent) 2. natural monopoly 3. key resource 4. government (copyright) 5. natural monopoly.

Marginal revenue

Why is $MR < P$ for a monopoly?

Competitive firm

- One of many; faces a **flat** demand curve.
- Can sell more without cutting price: $MR = P$.

Monopoly

- The only firm; faces the **downward-sloping** market demand.
- To sell one more unit, it must cut the price on *every* unit: $MR < P$.

Selling one more unit has two effects on revenue:

- **Output effect** $(+)$: one more unit sold at the new price.
- **Price effect** $(-)$: the price falls on all the units you were already selling.

If the price effect is bigger, **MR is negative**. (For every firm, $P = AR$.)

Problem: JJ's Hairdo (the only salon in town)

Q	P	TR	AR	MR
0	\$60			
1	55			
2	50			
3	45			
4	40			
5	35			
6	30			
7	25			

Fill in TR, AR and MR. Then:

1. How does P compare with AR? With MR?
2. Why is MR negative when JJ goes from 6 to 7 haircuts?

Problem: JJ's Hairdo (the only salon in town)

Q	P	TR	AR	MR
0	\$60	0	–	
1	55	55	55	55
2	50	100	50	45
3	45	135	45	35
4	40	160	40	25
5	35	175	35	15
6	30	180	30	5
7	25	175	25	-5

Fill in TR, AR and MR. Then:

1. How does P compare with AR? With MR?
2. Why is MR negative when JJ goes from 6 to 7 haircuts?

Problem: JJ's Hairdo (the only salon in town)

Q	P	TR	AR	MR
0	\$60	0	–	
1	55	55	55	55
2	50	100	50	45
3	45	135	45	35
4	40	160	40	25
5	35	175	35	15
6	30	180	30	5
7	25	175	25	-5

Fill in TR, AR and MR. Then:

1. How does P compare with AR? With MR?
2. Why is MR negative when JJ goes from 6 to 7 haircuts?

Answer: $P = AR$ in every row.
$MR < P$ after the first unit.

Problem: JJ's Hairdo (the only salon in town)

Q	P	TR	AR	MR
0	\$60	0	–	
1	55	55	55	55
2	50	100	50	45
3	45	135	45	35
4	40	160	40	25
5	35	175	35	15
6	30	180	30	5
7	25	175	25	-5

Fill in TR, AR and MR. Then:

1. How does P compare with AR? With MR?
2. Why is MR negative when JJ goes from 6 to 7 haircuts?

Answer: $P = AR$ in every row. $MR < P$ after the first unit.

Answer: Output effect: the 7th cut brings in \$25. Price effect: the other 6 cuts each lose \$5, so $-$\$30. $MR = 25 - 30 = -5$.

Profit maximization

How a monopoly picks Q and P

1. **Quantity:** produce where $MR = MC$ (same rule as any firm).
2. **Price:** go *up* to the demand curve at that Q. That is the highest price buyers will pay for that quantity.
3. **Profit:** $(P - ATC) \times Q$.

Key facts

- At the monopoly outcome, $P > MR = MC$.
- A monopoly has **no supply curve**: Q and P are chosen together from demand, MR and MC.
- Revenue is largest where $MR = 0$. That is *not* the profit-maximizing quantity unless $MC = 0$.

Problem: a monopoly step by step

Q	P	TR	MR
0	\$10		10
1	9		
2	8		
3	7		
4	6		
5	5		
6	4		
7	3		
8	2		

A patented app has the demand schedule on the left.

1. What is total revenue at each Q?
2. What is MR at each Q? (Average the change in TR just before and just after. MR at $Q = 0$ is \$10.)
3. Which quantity and price maximize *revenue*? What is MR there?

Problem: a monopoly step by step

Q	P	TR	MR
0	\$10	0	10
1	9	9	
2	8	16	
3	7	21	
4	6	24	
5	5	25	
6	4	24	
7	3	21	
8	2	16	

A patented app has the demand schedule on the left.

1. What is total revenue at each Q?
2. What is MR at each Q? (Average the change in TR just before and just after. MR at $Q = 0$ is \$10.)
3. Which quantity and price maximize *revenue*? What is MR there?

Problem: a monopoly step by step

Q	P	TR	MR
0	\$10	0	10
1	9	9	8
2	8	16	6
3	7	21	4
4	6	24	2
5	5	25	0
6	4	24	−2
7	3	21	−4
8	2	16	−6

A patented app has the demand schedule on the left.

1. What is total revenue at each Q?
2. What is MR at each Q? (Average the change in TR just before and just after. MR at $Q = 0$ is \$10.)
3. Which quantity and price maximize *revenue*? What is MR there?

Answer: e.g. at $Q = 1$: TR rises by 9, then by 7; midpoint $= 8$.

Problem: a monopoly step by step

Q	P	TR	MR
0	\$10	0	10
1	9	9	8
2	8	16	6
3	7	21	4
4	6	24	2
5	5	25	0
6	4	24	−2
7	3	21	−4
8	2	16	−6

A patented app has the demand schedule on the left.

1. What is total revenue at each Q?
2. What is MR at each Q? (Average the change in TR just before and just after. MR at $Q = 0$ is \$10.)
3. Which quantity and price maximize *revenue*? What is MR there?

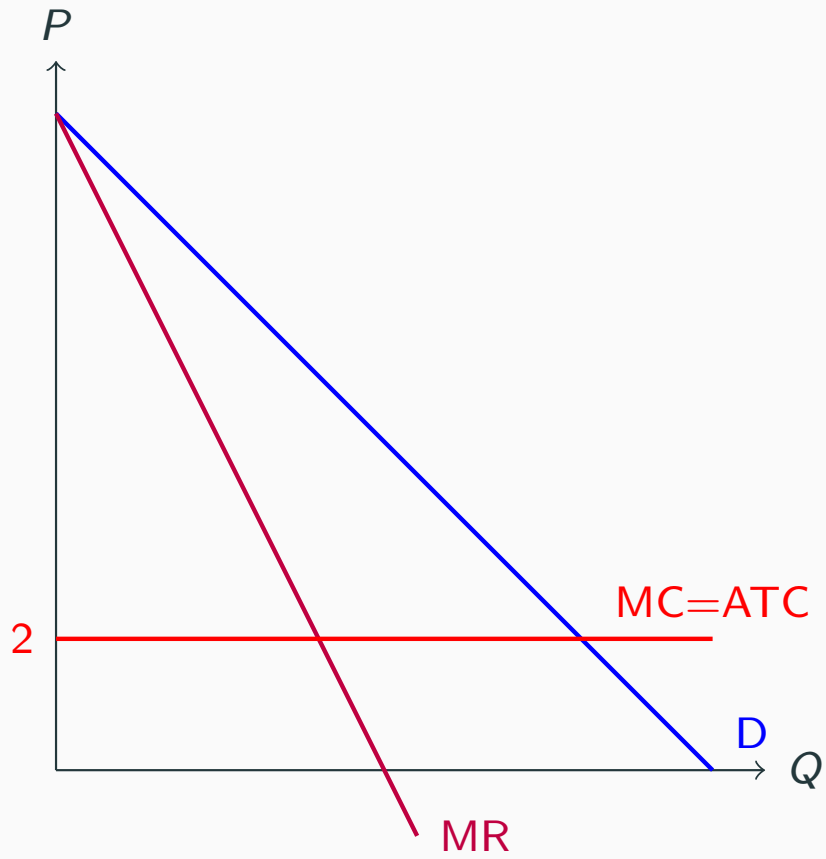
Answer: e.g. at $Q = 1$: TR rises by 9, then by 7; midpoint $= 8$.

Answer: $Q = 5$, $P = \$5$, $TR = 25$, and $MR = 0$.

Pattern: MR starts at the same price as demand (\$10) and falls *twice as fast*.

Problem (cont.): now add costs, $MC = ATC = \$2$

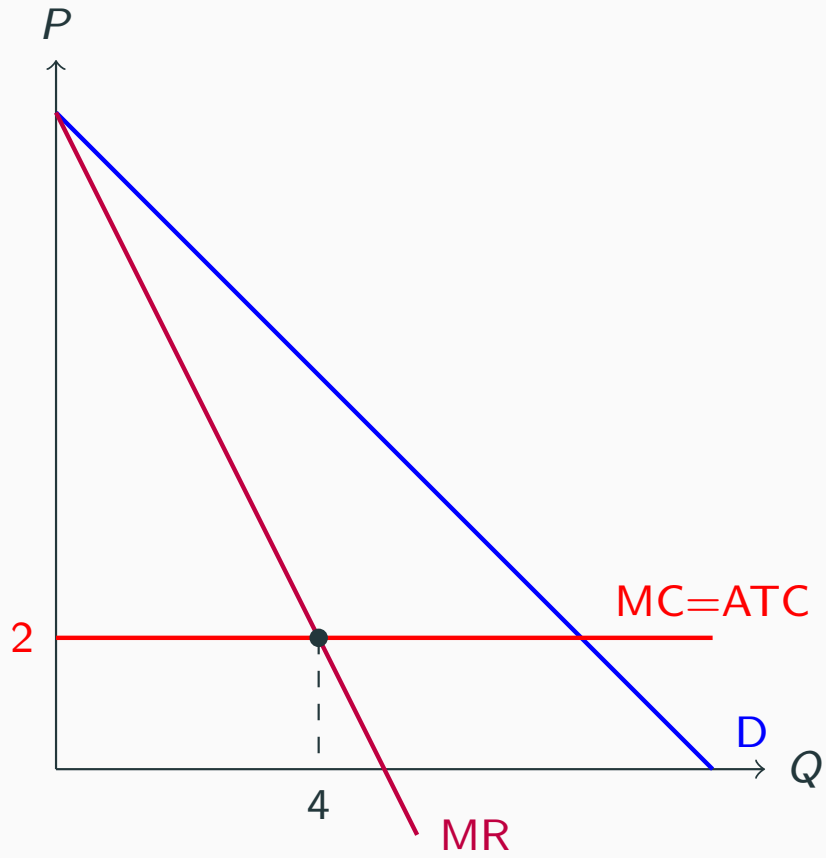
1. What quantity maximizes profit?
2. What price does the monopoly charge?
3. What is its profit? Where is it on the graph?
4. Why doesn't it produce $Q = 5$, where revenue is highest?



Problem (cont.): now add costs, $MC = ATC = \$2$

1. What quantity maximizes profit?
2. What price does the monopoly charge?
3. What is its profit? Where is it on the graph?
4. Why doesn't it produce $Q = 5$, where revenue is highest?

Answer: $Q = 4$, where $MR = MC = 2$.

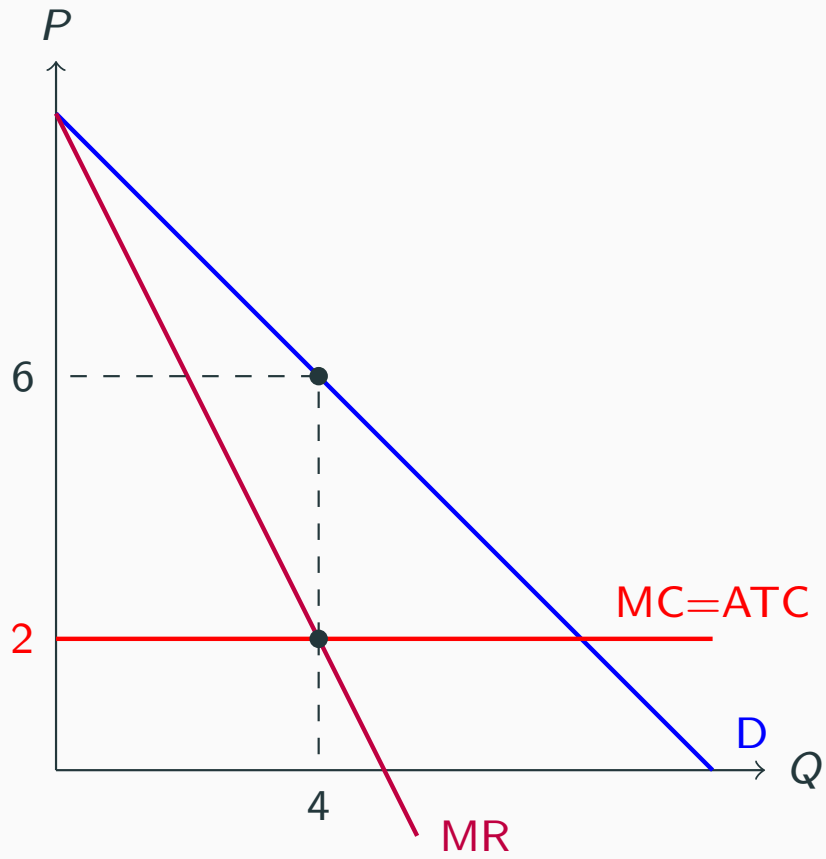


Problem (cont.): now add costs, $MC = ATC = \$2$

1. What quantity maximizes profit?
2. What price does the monopoly charge?
3. What is its profit? Where is it on the graph?
4. Why doesn't it produce $Q = 5$, where revenue is highest?

Answer: $Q = 4$, where $MR = MC = 2$.

Answer: $P = \$6$, read off demand.



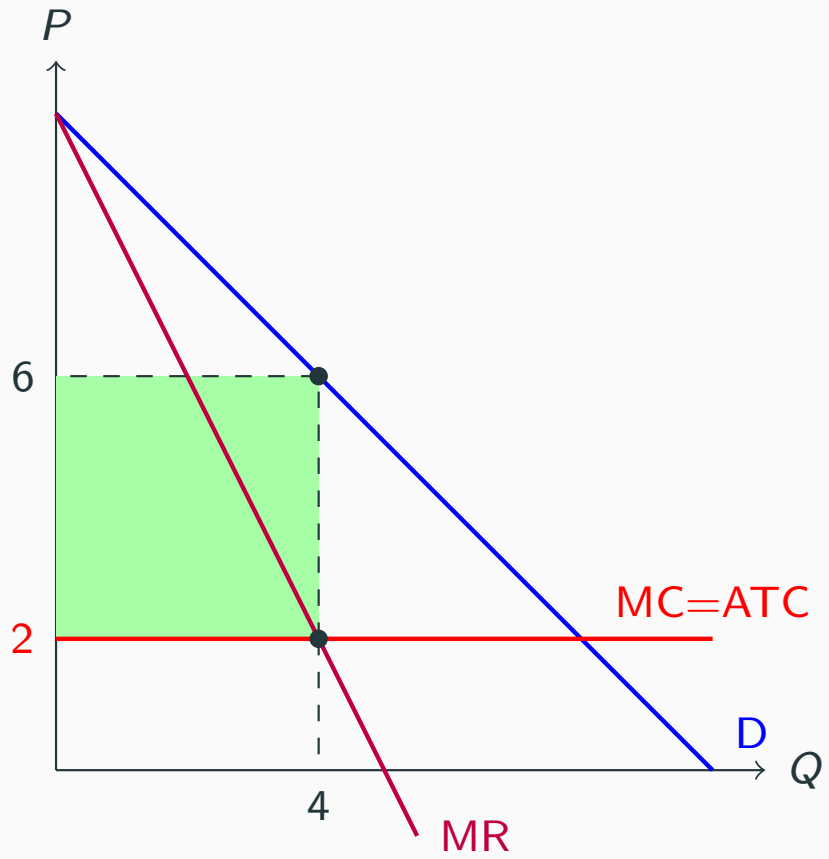
Problem (cont.): now add costs, $MC = ATC = \$2$

1. What quantity maximizes profit?
2. What price does the monopoly charge?
3. What is its profit? Where is it on the graph?
4. Why doesn't it produce $Q = 5$, where revenue is highest?

Answer: $Q = 4$, where $MR = MC = 2$.

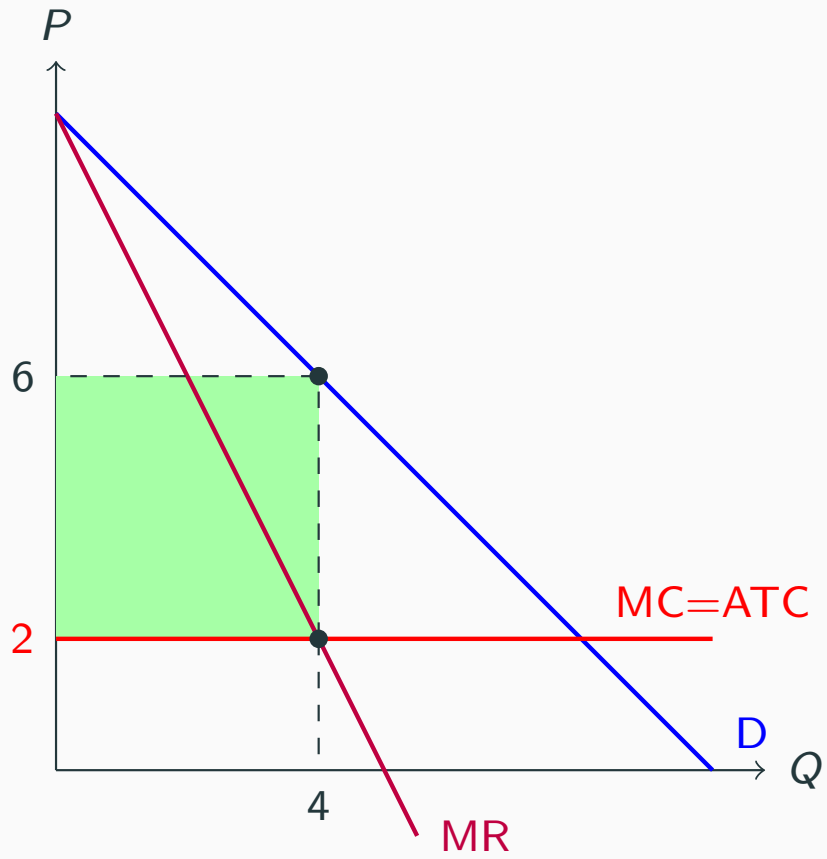
Answer: $P = \$6$, read off demand.

Answer: $(6 - 2) \times 4 = \$16$ (green).



Problem (cont.): now add costs, $MC = ATC = \$2$

1. What quantity maximizes profit?
2. What price does the monopoly charge?
3. What is its profit? Where is it on the graph?
4. Why doesn't it produce $Q = 5$, where revenue is highest?



Answer: $Q = 4$, where $MR = MC = 2$.

Answer: $P = \$6$, read off demand.

Answer: $(6 - 2) \times 4 = \$16$ (green).

Answer: The 5th unit adds \$0 of revenue but costs \$2 (profit $15 < 16$).

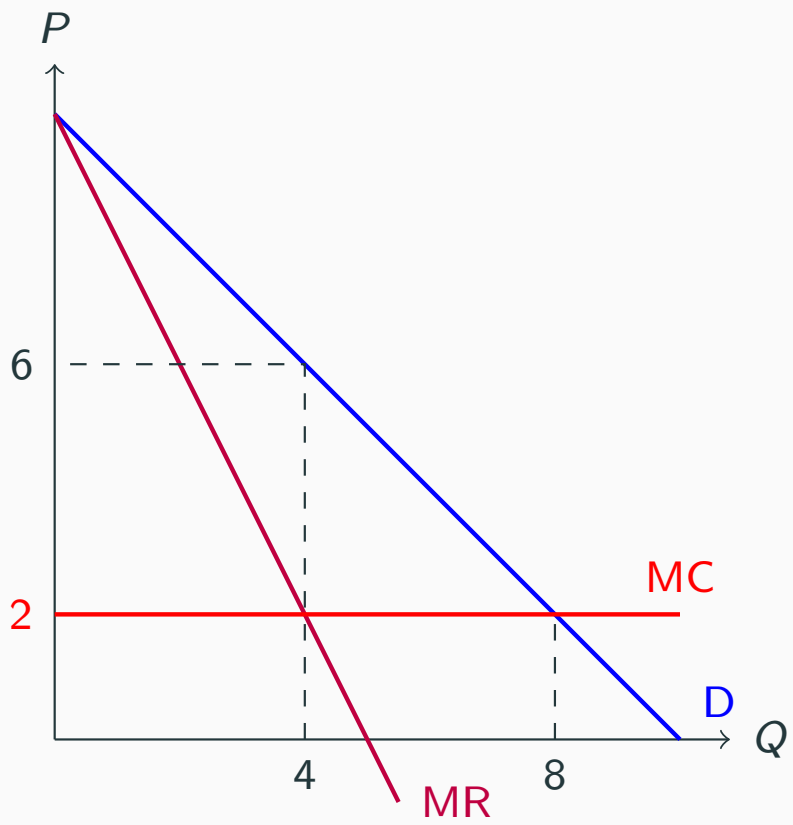
Welfare and deadweight loss

Problem (cont.): monopoly vs. competition

If the firm acted like a competitive market, it would set $P = MC$.

How does each outcome change under monopoly?

	Competition	Monopoly	Change
Q			
P			
CS			
PS			
TS			

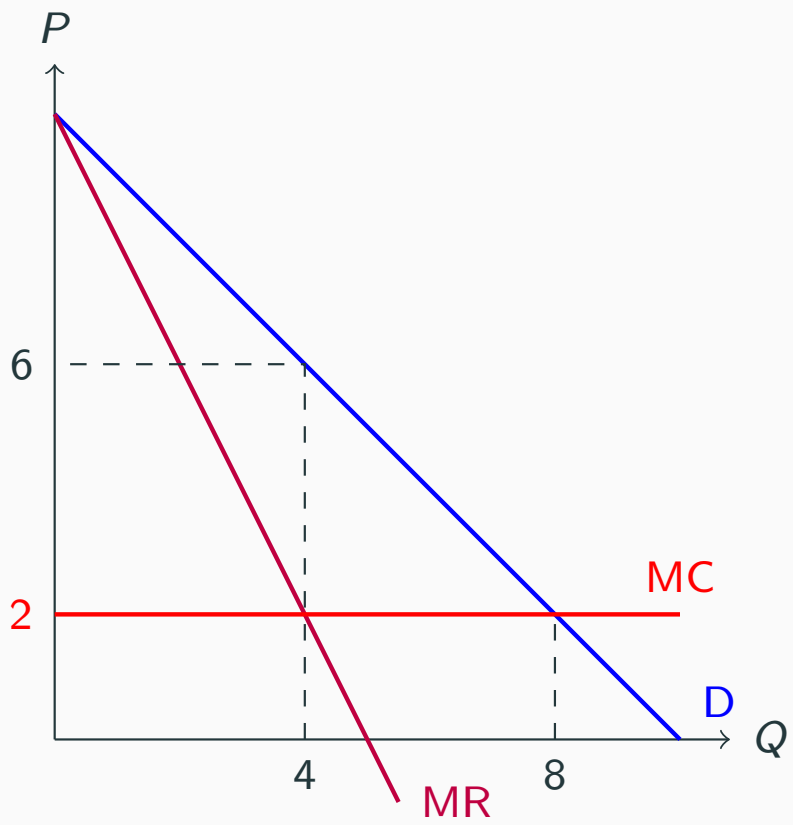


Problem (cont.): monopoly vs. competition

If the firm acted like a competitive market, it would set $P = MC$.

How does each outcome change under monopoly?

	Competition	Monopoly	Change
Q	8	4	-4
P	\$2	\$6	$+4$
CS			
PS			
TS			

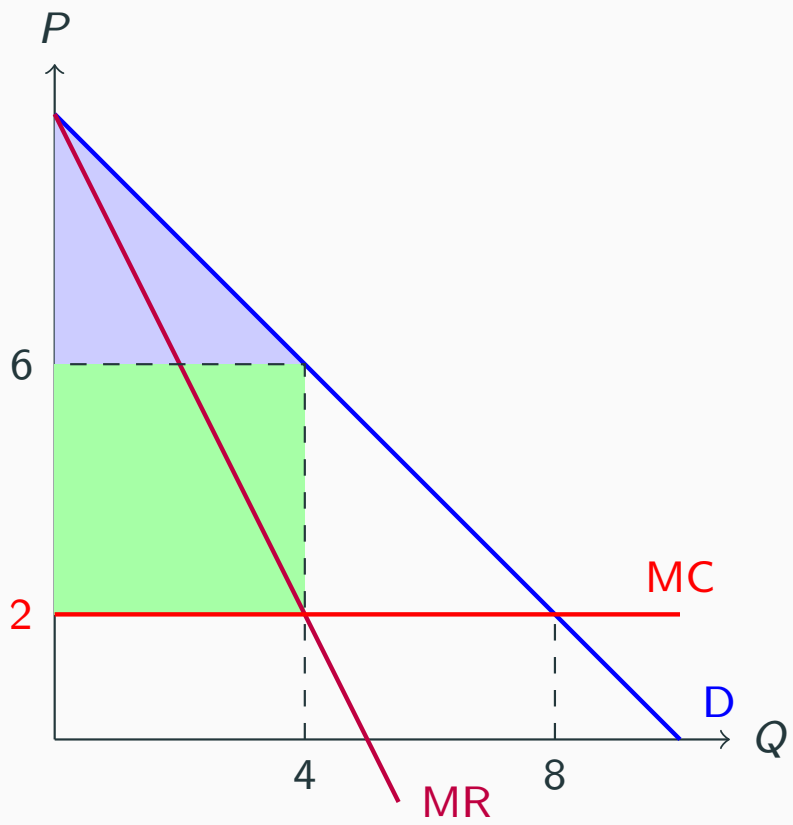


Problem (cont.): monopoly vs. competition

If the firm acted like a competitive market, it would set $P = MC$.

How does each outcome change under monopoly?

	Competition	Monopoly	Change
Q	8	4	-4
P	\$2	\$6	$+4$
CS	32	8	-24
PS	0	16	$+16$
TS			



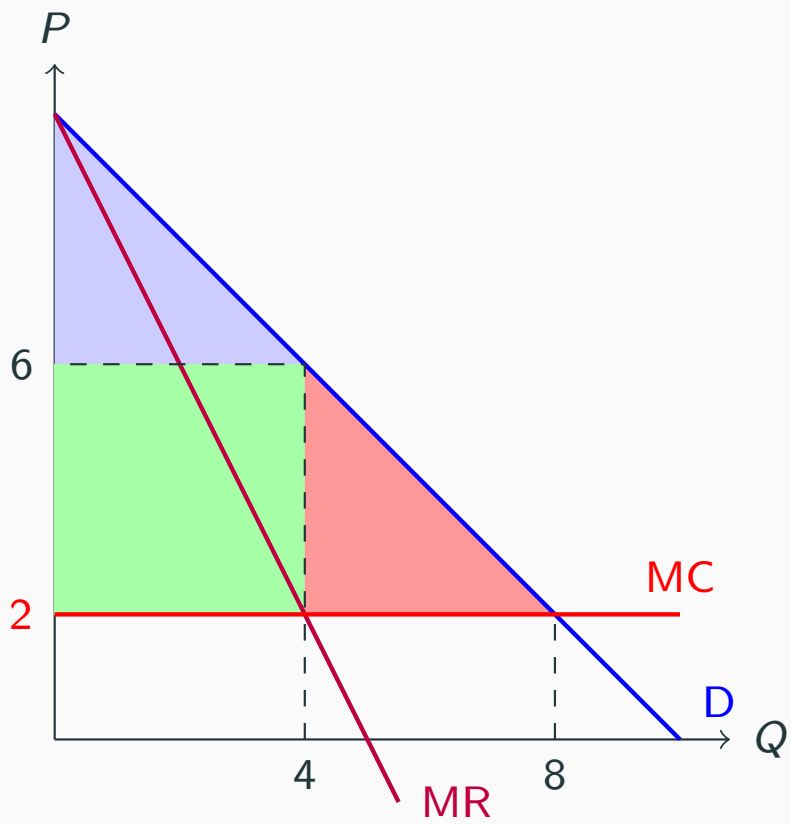
Answer: CS: $\frac{1}{2} \cdot 8 \cdot 8$ vs. $\frac{1}{2} \cdot 4 \cdot 4$ (blue). PS = profit (green).

Problem (cont.): monopoly vs. competition

If the firm acted like a competitive market, it would set $P = MC$.

How does each outcome change under monopoly?

	Competition	Monopoly	Change
Q	8	4	-4
P	\$2	\$6	$+4$
CS	32	8	-24
PS	0	16	$+16$
TS	32	24	-8



Answer: CS: $\frac{1}{2} \cdot 8 \cdot 8$ vs. $\frac{1}{2} \cdot 4 \cdot 4$ (blue).
PS = profit (green).
Answer: DWL $= \frac{1}{2} \cdot 4 \cdot 4 = 8$ (red).

What's actually wrong with monopoly?

- At the monopoly Q, $P > MC$: buyers value one more unit more than it costs to make.
- So it produces **too little** ($Q_M < Q_C$): the lost trades are the **deadweight loss**.
- Monopoly **profit** is a **transfer** from consumers; it does not shrink total surplus.

True or false?

1. The inefficiency of monopoly is that the firm earns a profit.
2. A monopoly charges the highest price it can.
3. The DWL is the area between demand and MC from Q_M to Q_C.

What's actually wrong with monopoly?

- At the monopoly Q, $P > MC$: buyers value one more unit more than it costs to make.
- So it produces **too little** ($Q_M < Q_C$): the lost trades are the **deadweight loss**.
- Monopoly **profit** is a **transfer** from consumers; it does not shrink total surplus.

True or false?

1. The inefficiency of monopoly is that the firm earns a profit.
2. A monopoly charges the highest price it can.
3. The DWL is the area between demand and MC from Q_M to Q_C.

Answer: 1. False: the problem is the lost output (DWL). 2. False: the highest price *for the Q where $MR = MC$*. 3. True.

Open up Canvas and navigate to **“In-Class Activity 9 (Discussions)”**!

Please scan the QR code and fill out the attendance form!

