

Econ 1101: Monopoly

Week 11

Spring 2013

Section 40

Week 11, Lectures 1 and 2

November 12, 2013

Announcements

- Go to recitation this week to get assigned to a group for your second platform debate!
- Also will do a monopoly worksheet this week that will be very helpful

Assignments:

- For next week external reading # 7

Monopoly: plan for today

- **Introducing Monopolies**
- **Inefficiencies of monopoly**
- **Natural monopoly**
- Perfect price discrimination
- Imperfect price discrimination

1. Introducing Monopolies

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Monopolist vs Competitive Firm

How are they **similar**?

1. Both try to maximize profit (= revenue – costs)
2. So both set quantity where marginal rev. = marginal cost
(MR = MC)

How are they **different**?

When competitive firm sells more unit, price stays the same

- $MR = P$ (for any quantity the firm decide to sell)
- Same as saying price taker

When monopoly firm sells more price falls

- In general we will have $MR < P$

Example (MR)

For example: Lemonade Stand

Suppose you can sell

1 lemonade at $P = \$1.00$ each

2 lemonade at $P = 50\text{¢}$ each (Recall the Law of Demand!)

Sell second one, cash register rings up 50¢. Is this MR?

No!!!! (we are letting P to change MR is not equal to P)

- Sell one: Revenue = \$1.00
- Sell two: Revenue = $.50 + .50 = \$1$

So marginal revenue = 0!

As we conjecture above $MR = 0 < P = 0.5$ (for $q=2$)

(Note: this is uniform price monopoly. Things are different if can price discriminate)

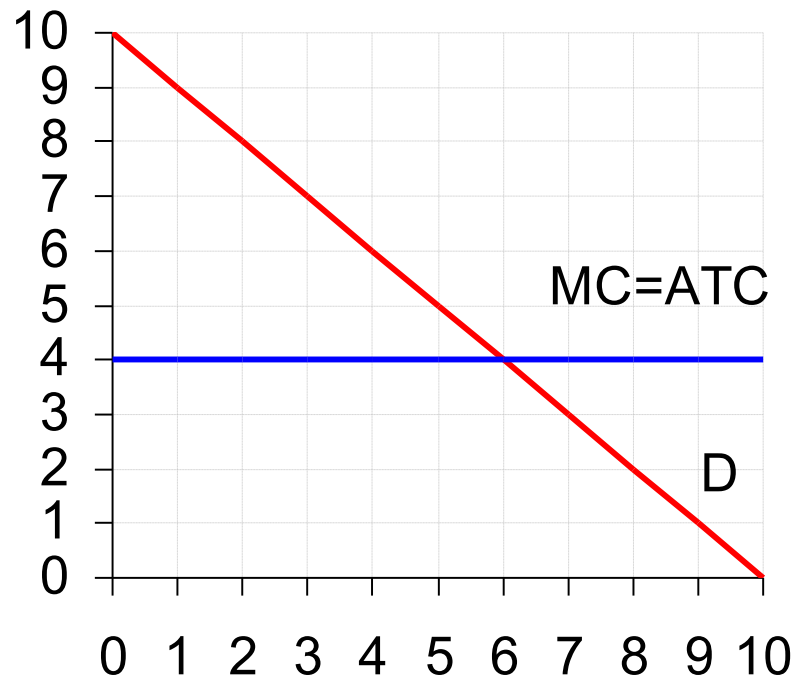
Ex: Widget Monopoly (Econland no fixed cost)

S1-S3 and S5-S10 all died.

S4 now has monopoly of widgets in Econland

One change: now she can produce as many widgets as she wants at $ATC = 4$. (So $MC = 4$ too)

- We are assuming the cost structure is such that $MR=ATC=4$
 - You can double check using cost formulas that this implies $a=0$, $b=0$ (so no fixed cost)



If perfect competition, then

- $P = 4$
- Note $P = MC$
- $Q = 6$

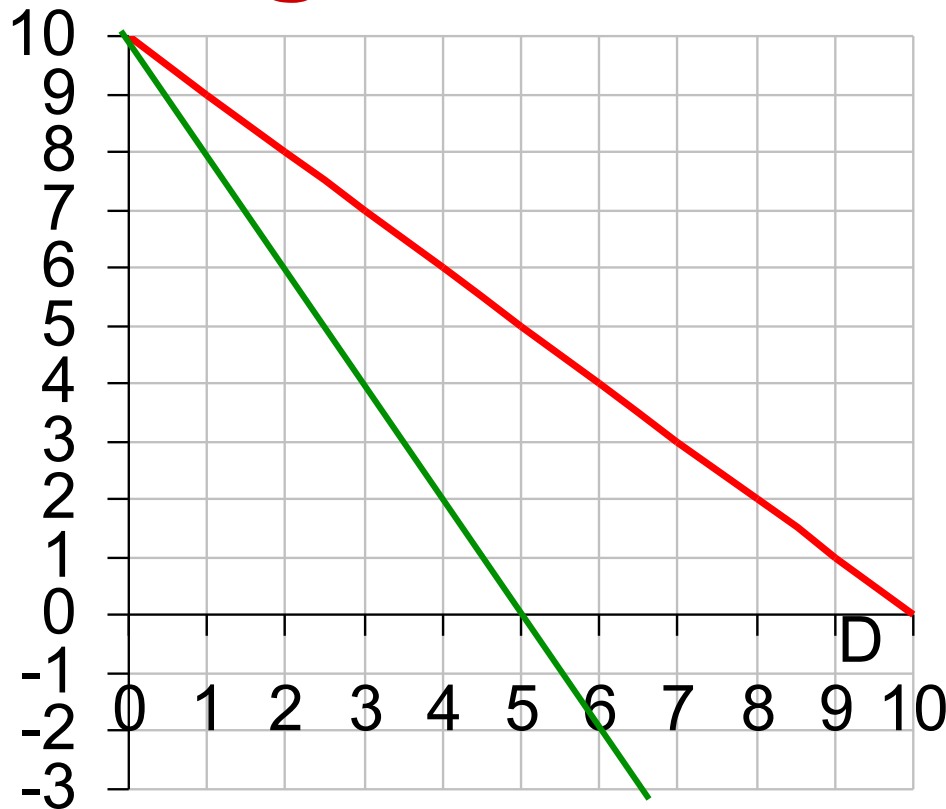
But with monopoly, need to do something different.

- Let's figure out Marginal Revenue (we can use midpoint formula)

Q	P	Revenue P×Q	MR (midpoint)
0	10	0	---
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
9	1	9	8

- MR between Q=0 and Q=1 is $9-0=9$
- MR between Q=1 and Q=2 is $16-9=7$
- MR at Q=1 is 8 . (Take midpoint: $9+7/2$)

Trick: marginal Revenue



Rules for **MR** of linear demand

- vertical intercept same as demand
- horizontal intercept is halfway ($10/2$)

MR comes from:

Picture is all you need for this class. But if you like an equation...

$$\begin{aligned}\text{Rev} &= P \times Q \\ &= (10 - Q) \times Q \\ &= 10Q - Q^2\end{aligned}$$

Marginal Revenue is slope

$$\text{MR} = 10 - 2Q$$

Test your knowledge

What if Demand looks like:

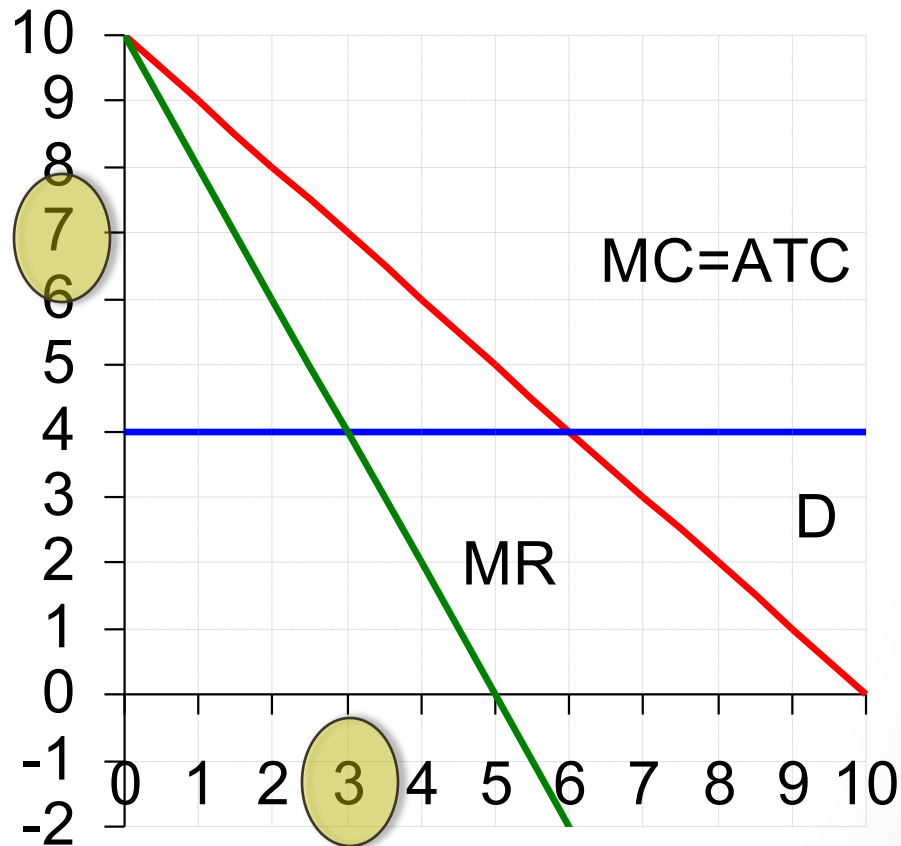


So let's go back to S4's problem and figure out what she should do.

Getting optimal quantity of monopoly: (MR=MC)

Put in MC to find optimal output

Profit maximizing $Q = 3$
Price that goes with this
is $P^M = \$7$ (from D)
Profit = $[P - ATC]$
 $= [7 - 4] * 3 = 9$
See it on graph



Q=3 is profit maximizing

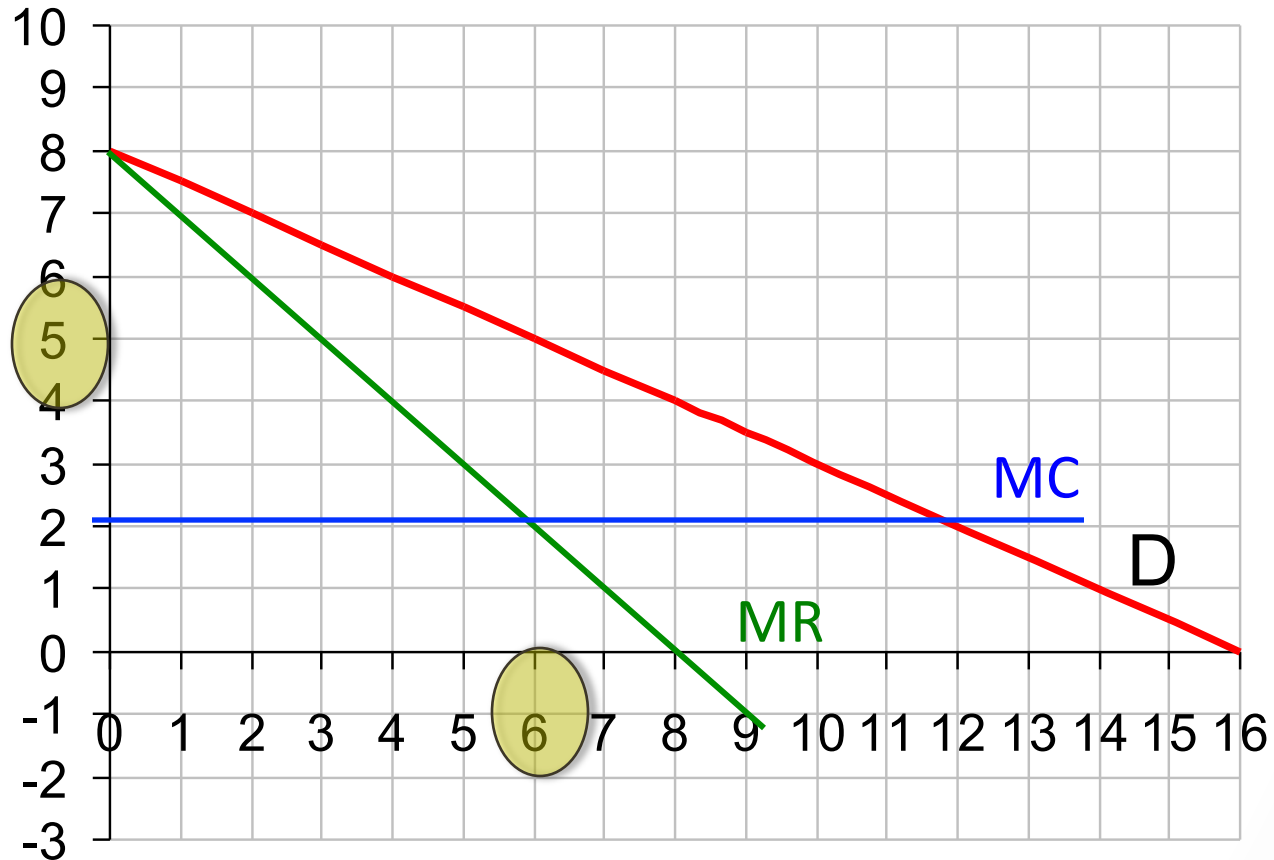
Check that it is profit maximizing

Q	P	Rev	Cost	Profit
1	9	9	4	5
2	8	16	8	8
3	7	21	12	9
4	6	24	16	8
5	5	25	20	5

$$TC = ATC * q \quad \text{Profit} = \text{Rev} - TC$$

Recap and self check:

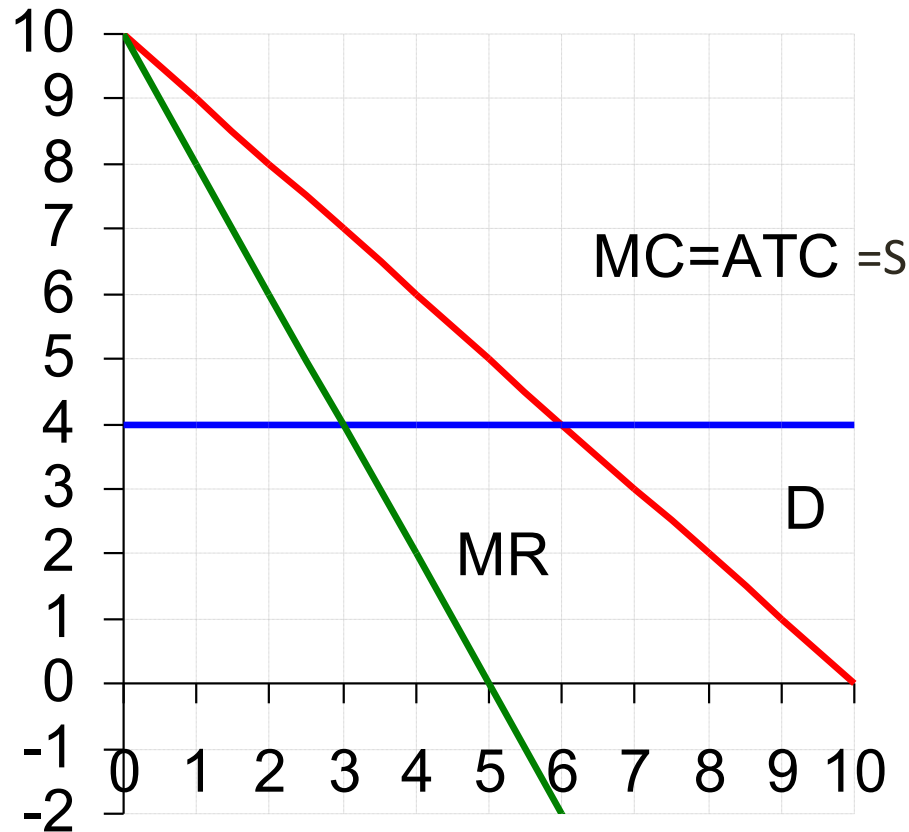
What if demand looked like this and $MC = 2$? Figure out the monopoly price and quantity.



2. Inefficiencies of monopoly

- Introducing Monopolies
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Inefficiency of Monopoly



There is a wedge between D and S
Just like a \$3 tax,
But monopolist gets tax revenue!

Welfare impact

	Perfect Comp.	Monopoly	Change
Q	6	3	-3
P	4	7	+3
CS	18	4.5	-13.5
PS	0	9	9
TS	18	13.5	-4.5

1. Monopoly results in a loss of CS of 13.5 from the higher price.
2. Part is a transfer from consumers to the firm. Called a monopoly rent

... welfare impact

3. Part of consumer loss is deadweight loss of -4.5.
Too little output (condition 3 violation).

First Welfare Theorem does not hold when we have monopoly.

4. Can have additional social costs:
 - Monopoly **Rent Seeking Behavior**
 - This are efforts taken by firms to secure a monopoly

Example in Econland. Suppose give monopoly to first person in line. Suppose time costs \$1 hour. In equilibrium one person gets in line for 9 hours. All the monopoly rent is dissipated

Rent seeking

In real world:

- We associate rent seeking behavior with firms trying to manipulate legal, political and economic institutions (like the patent system) to keep out rivals.
- Rent seeking behavior can cause more DWL by misallocating resources like time and money to lawyers, lobbying, etc. These resources are social waste (opportunity cost) that adds no wealth to society

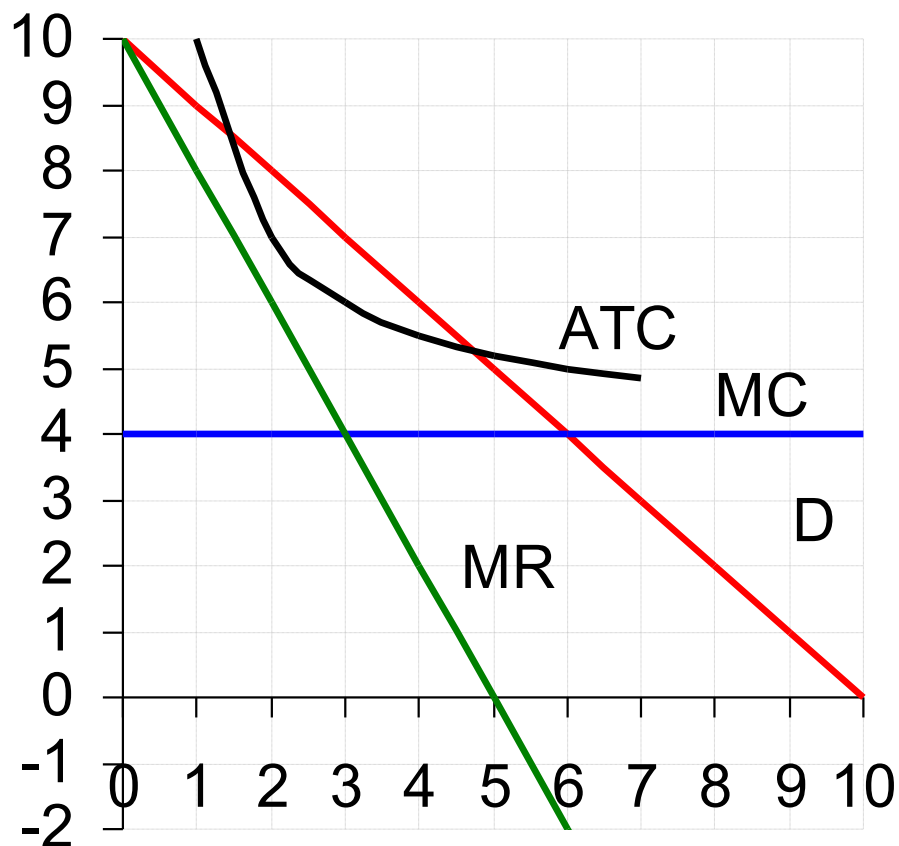
3. Natural Monopoly

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Natural Monopoly

- If economies of scale are important (example large initial fixed costs), there may only be room for one firm.
- Class example: old telephone companies: fixed cost preventing other firms from entering.
- Quick example: go back to S4 widget monopoly and assume suppose a **fixed cost of \$6**.
- Even if there is free entry and lots of people just like S4, only one will enter.
- Remember without the fixed cost monopoly profit is \$9.
- With fixed cost, a monopolist earns $\$3 = \$9 - \$6$.
- If two firms enter, even if they act like monopoly, the \$9 can't cover paying fixed cost twice. So we get a natural monopoly

Introducing fixed costs



Discuss: add fixed cost, price stays the same. Why?

- Because MC has not changed so $MR=MC$ and optimal quantity is the same as before, so price is the same.

Can confirm the profit maximizing quantity is still 3 (but profits will be lower)

Can use the table to see this.

Q	P	Rev	FC = 0		FC = 6	
			Cost	Profit	Cost	Profit
1	9	9	4	5	10	-1
2	8	16	8	8	14	2
3	7	21	12	9	18	3
4	6	24	16	8	22	2
5	5	25	20	5	26	-1

Adding the Fixed Cost $TC = \text{old } TC + FC$

- Profits are scaled down but they are still maximized at $q=3$

Real world examples natural monopoly

Some real world examples of Natural Monopoly

- Distribution of residential electric power.
- Water
- Gas station in very small town