

**Appasaheb R. B. Garud college  
shendurni**

# **MONOPOLY**

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# ***MONOPOLY***

**A monopoly is a firm which is the sole producer of a good or service for which there are no close substitutes.**

**The monopolist's demand curve is the same as the market demand curve.**

**The firm must have some way to keep prospective entrants out of the industry, i.e., there must be barriers to entry.**

# *BARRIERS TO ENTRY*

Barriers to entry prevent other firms from entering an industry in which a monopolist may be earning profit.

Government franchises

Patents and copyrights

Economies of scale

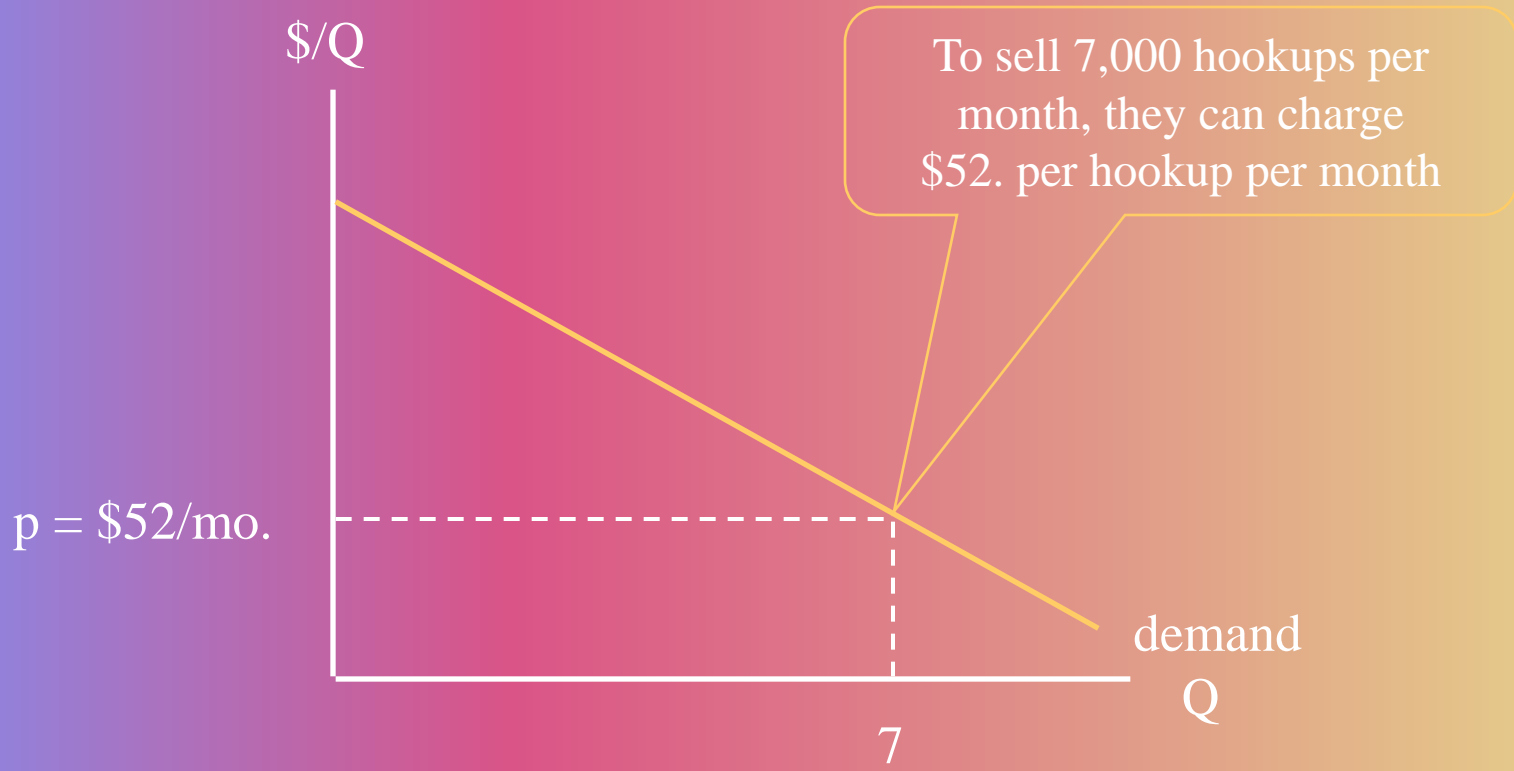
Ownership of a scarce input

Because the demand curve the monopolist sees is negatively sloped, the monopolist can choose price as well as the quantity of output. (Price and quantity sold are linked by the demand curve. The demand curve sets the limit that can be charged for each quantity produced.)

# *REVENUE CURVES FOR A MONOPOLIST*

The market demand curve for a good is the firm's average revenue curve.

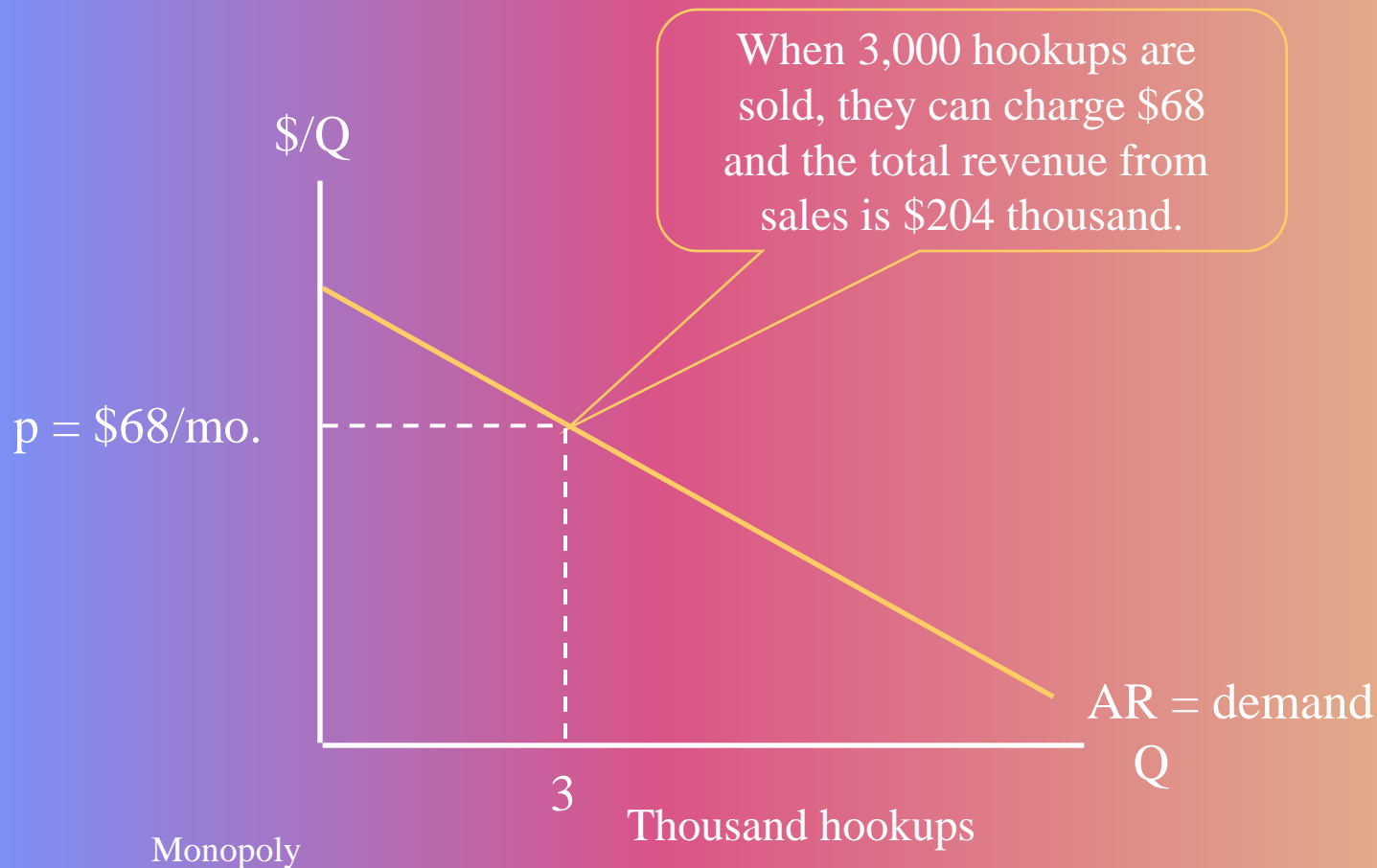
The demand curve shown here is the market demand curve for cable TV hookups in East Lansing. Because the Ripoff Cable TV Co. has an exclusive franchise, the market demand curve is also the firm's average revenue curve. (AR = price)



From the demand curve we can find the firm's total revenue curve (TR as a function of Q).

Total revenue is price times quantity.

We can then compare total revenue with total costs at each output to find the output and price where profits are maximized.

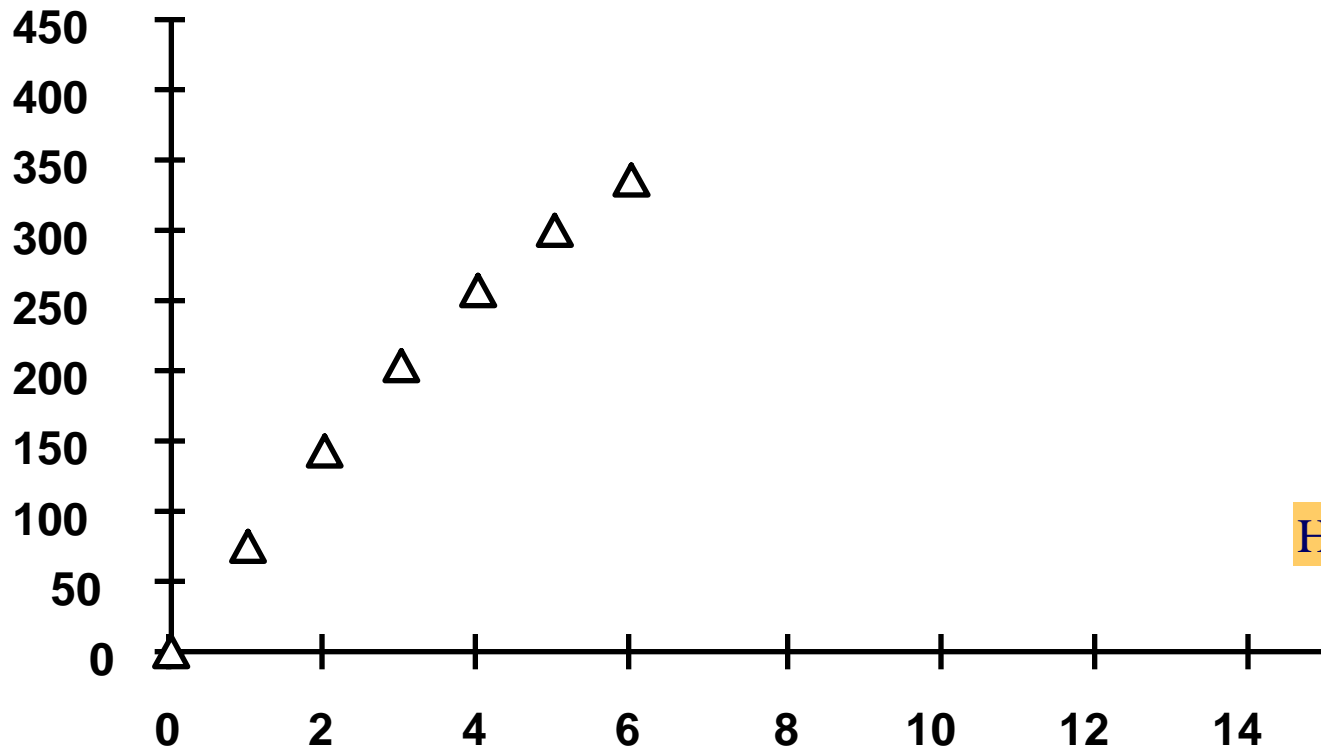


Q	P (=AR)	TR
0	80	0
1	76	76
2	72	144
3	68	204
4	64	256
5	60	300
6	56	336
7	52	
8	48	
9	44	
10	40	
11	36	

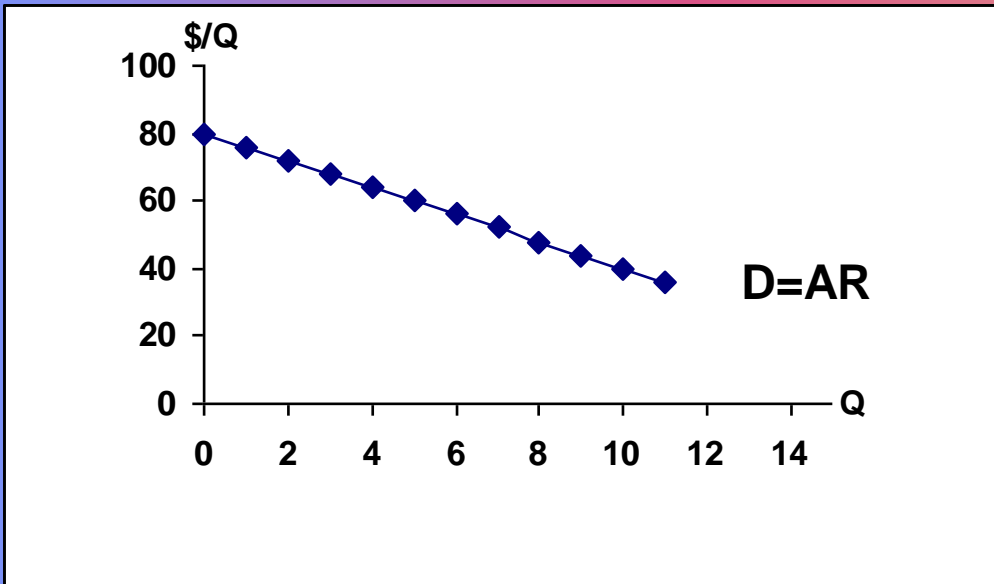
Here are other points on the demand curve and some corresponding amounts of total revenue. Fill in the remaining values for TR.



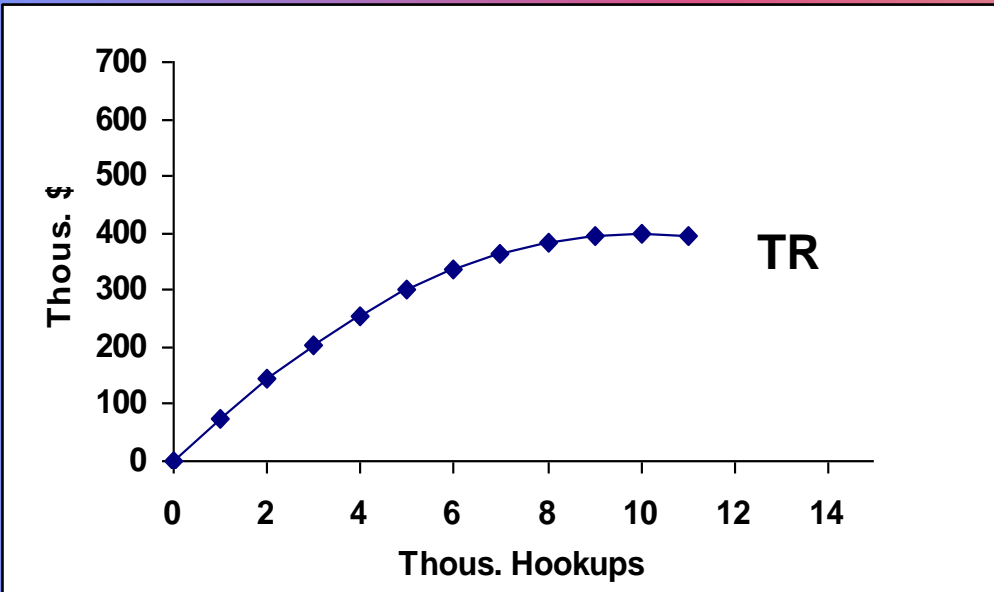
*Plot the remaining points on the TR curve.*



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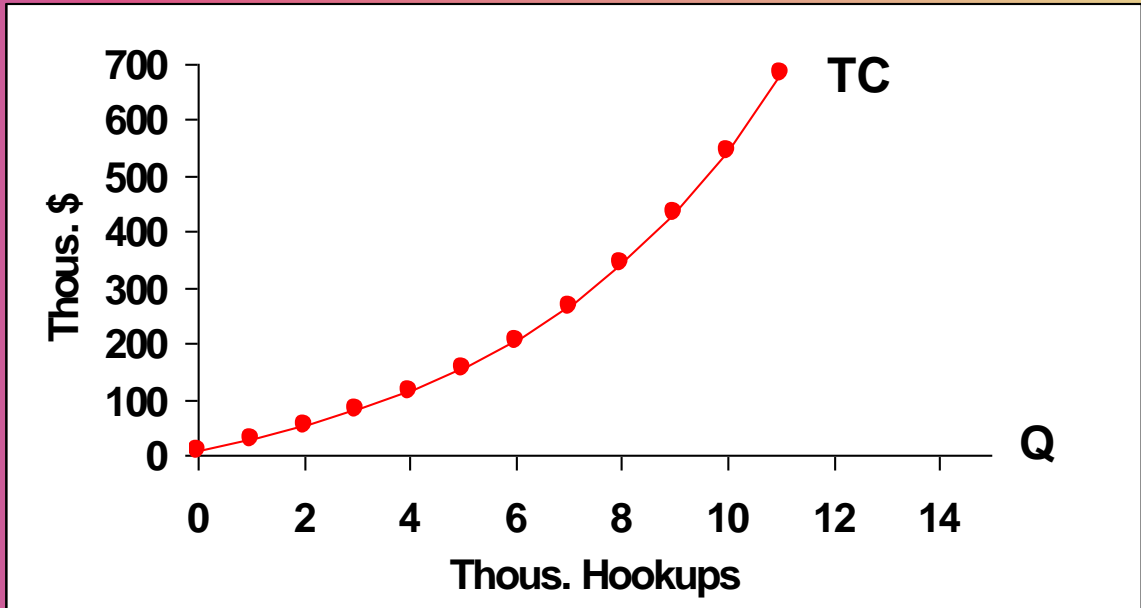
**Here's the demand curve with the corresponding total revenue curve.**



**Notice that the TR curve is not a straight line!**

Here is the total cost curve of the Ripoff Cable TV Co.

Q	TC
0	10
1	30
2	54
3	82
4	114
5	154
6	204
7	266
8	342
9	434
10	546
11	682

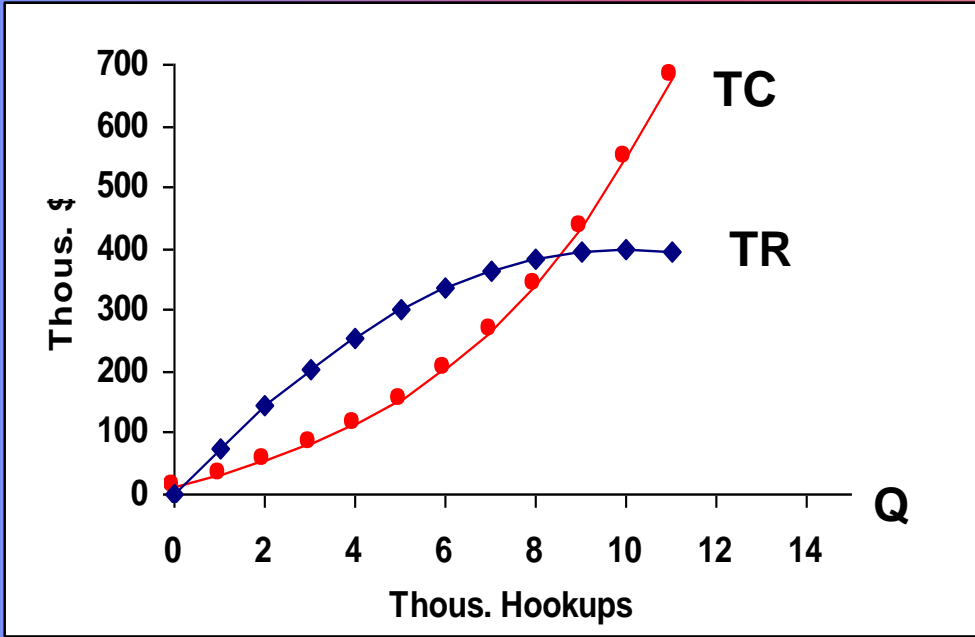


Q	TR	TC	Profit
0	0	10	-10
1	76	30	46
2	144	54	
3	204	82	
4	256	114	
5	300	154	
6	336	204	132
7	364	266	98
8	384	342	42
9	396	434	-38
10	400	546	-146
11	396	682	-286

**Profit = TR - TC**

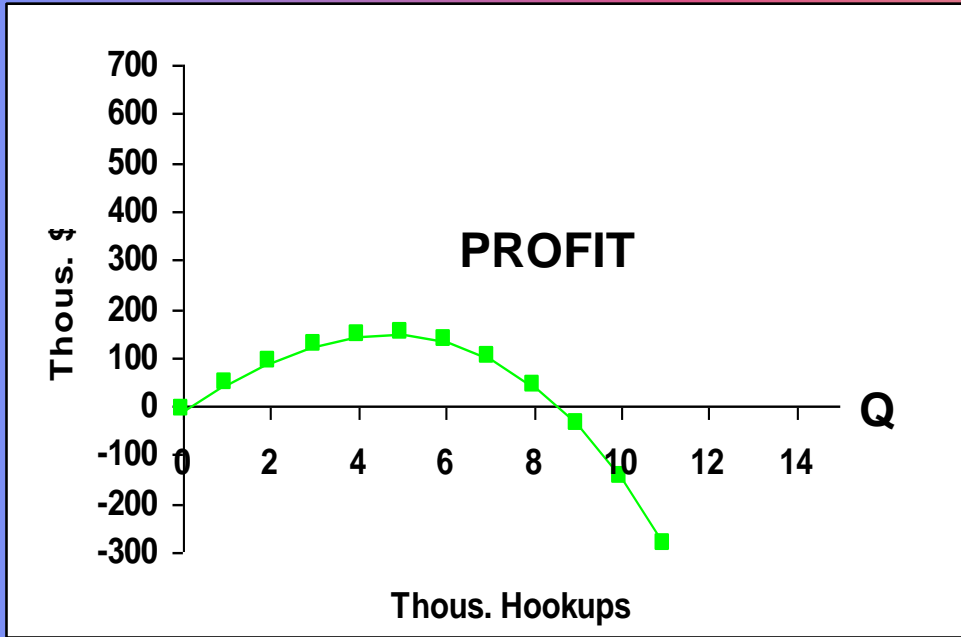
**We can put the total revenue and total cost curves together to find total profit. Compute the remaining values for profit.**

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**Profit is maximized here at 5,000 units of output.**

**The same problem can be solved by the marginal/average approach.**



For a monopolist, average revenue is declining as output increases so marginal revenue must be less than average revenue.

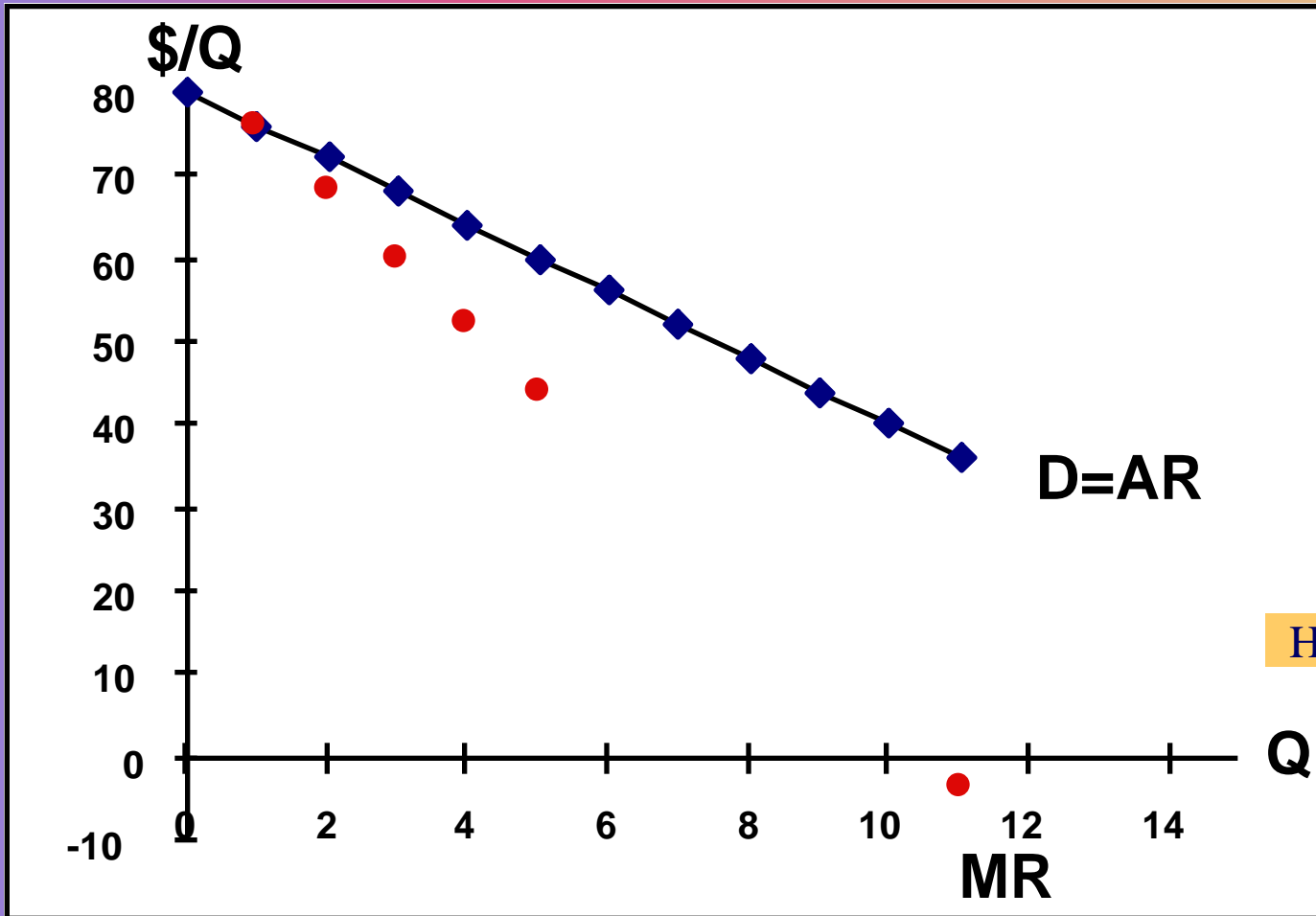
It is important to understand why MR is less than AR in this case.

Q	P (=AR)	TR	MR
0	80	0	
1	76	76	76
2	72	144	68
3	68	204	60
4	64	256	52
5	60	300	44
6	56	336	36
7	52	364	
8	48	384	
9	44	396	
10	40	400	
11	36	396	

Compute the missing values of Marginal Revenue.

$$MR = \frac{(300 - 256)}{(5 - 4)}$$

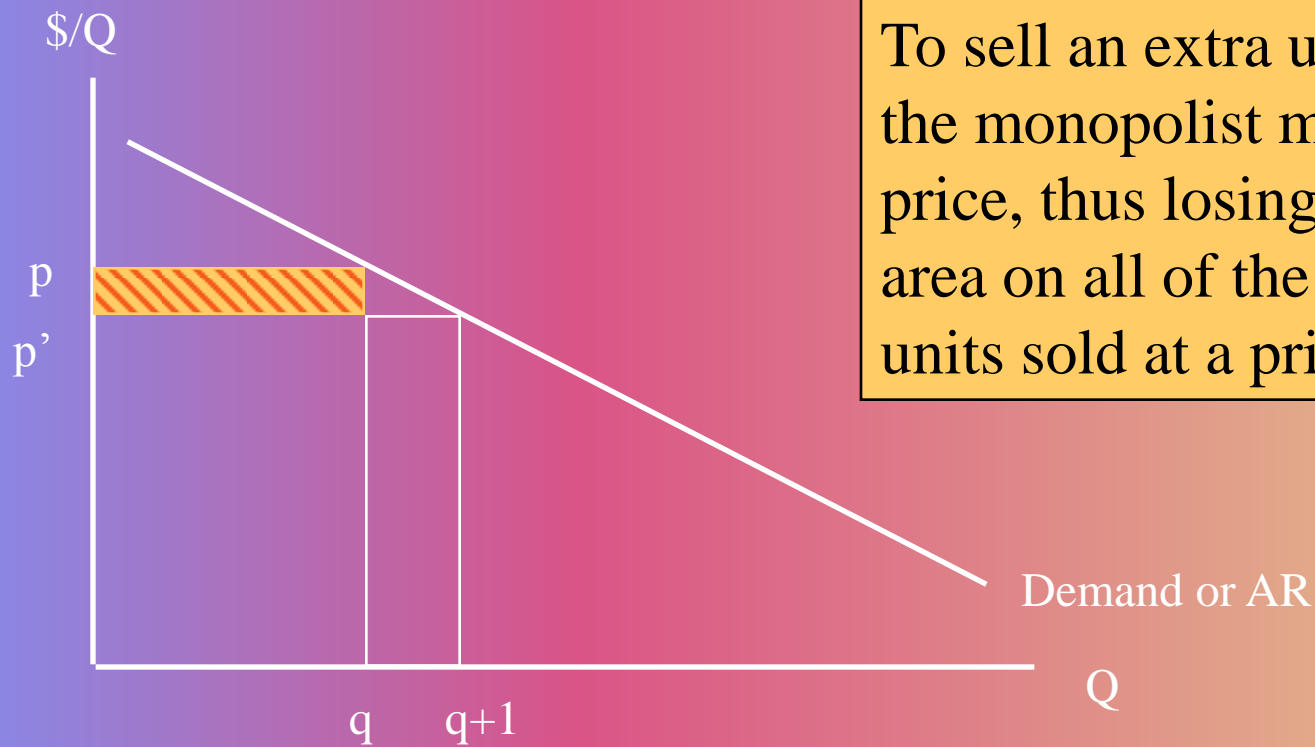
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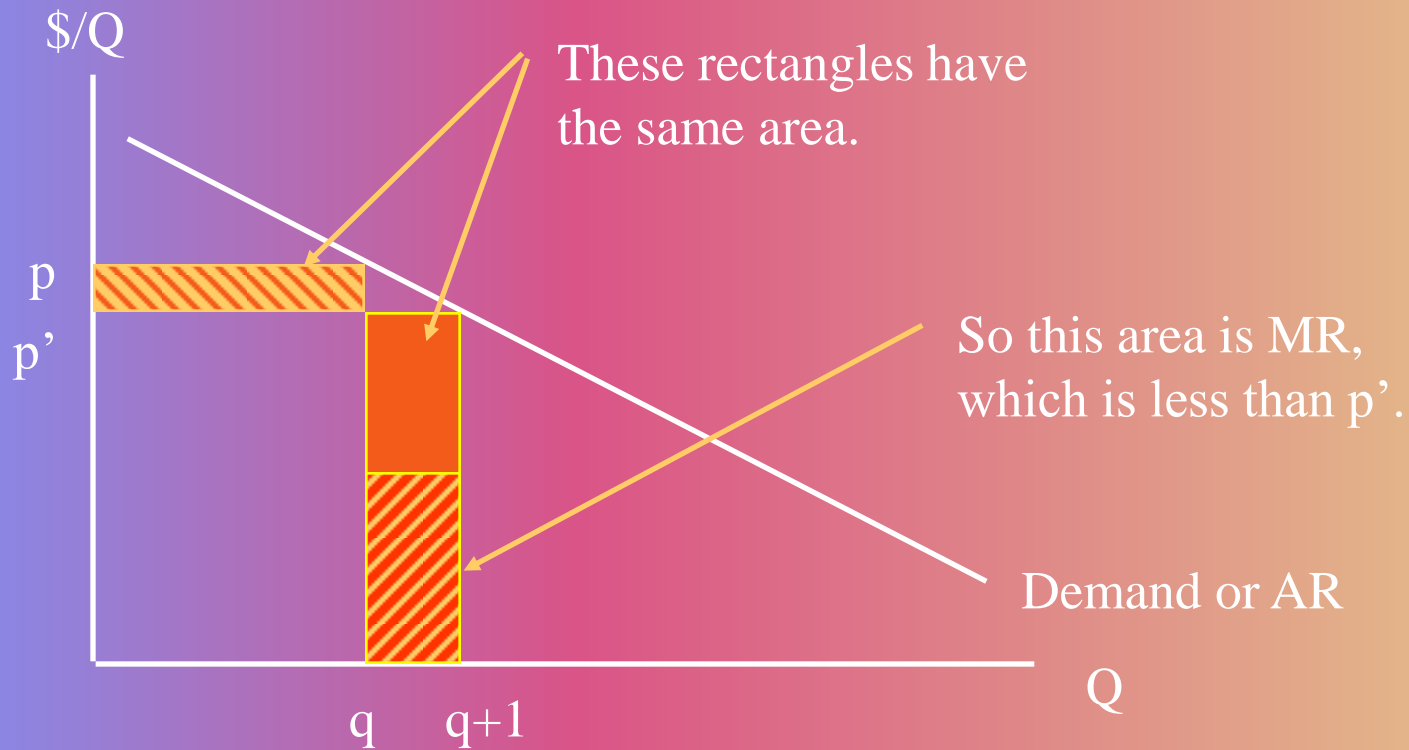


Marginal revenue is always less than price for a monopolist because the firm must reduce price in order to sell more.

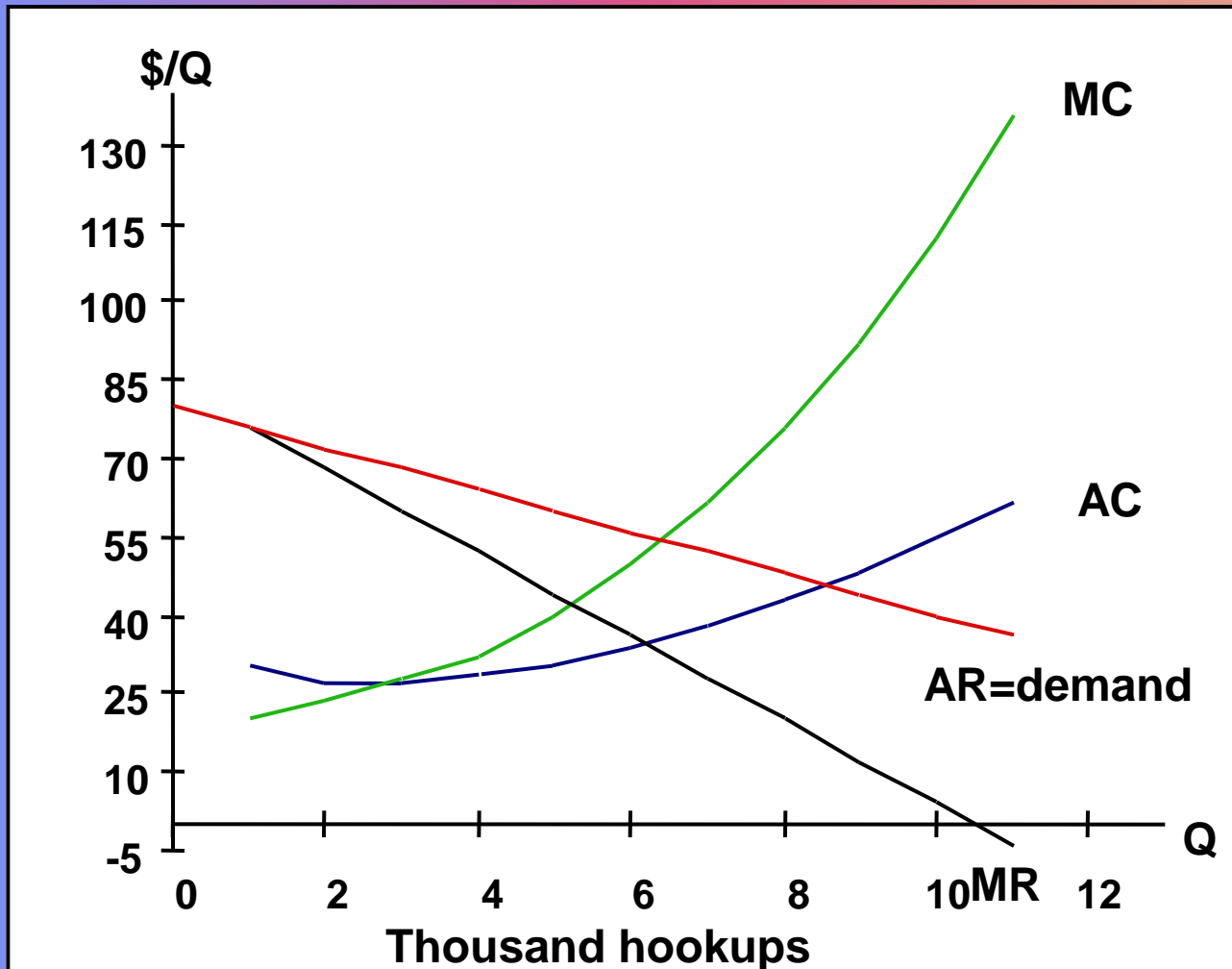


To sell an extra unit of output, the monopolist must lower price, thus losing the shaded area on all of the previous units sold at a price of  $p$ .

An increase in sales of one unit requires a reduction in price.

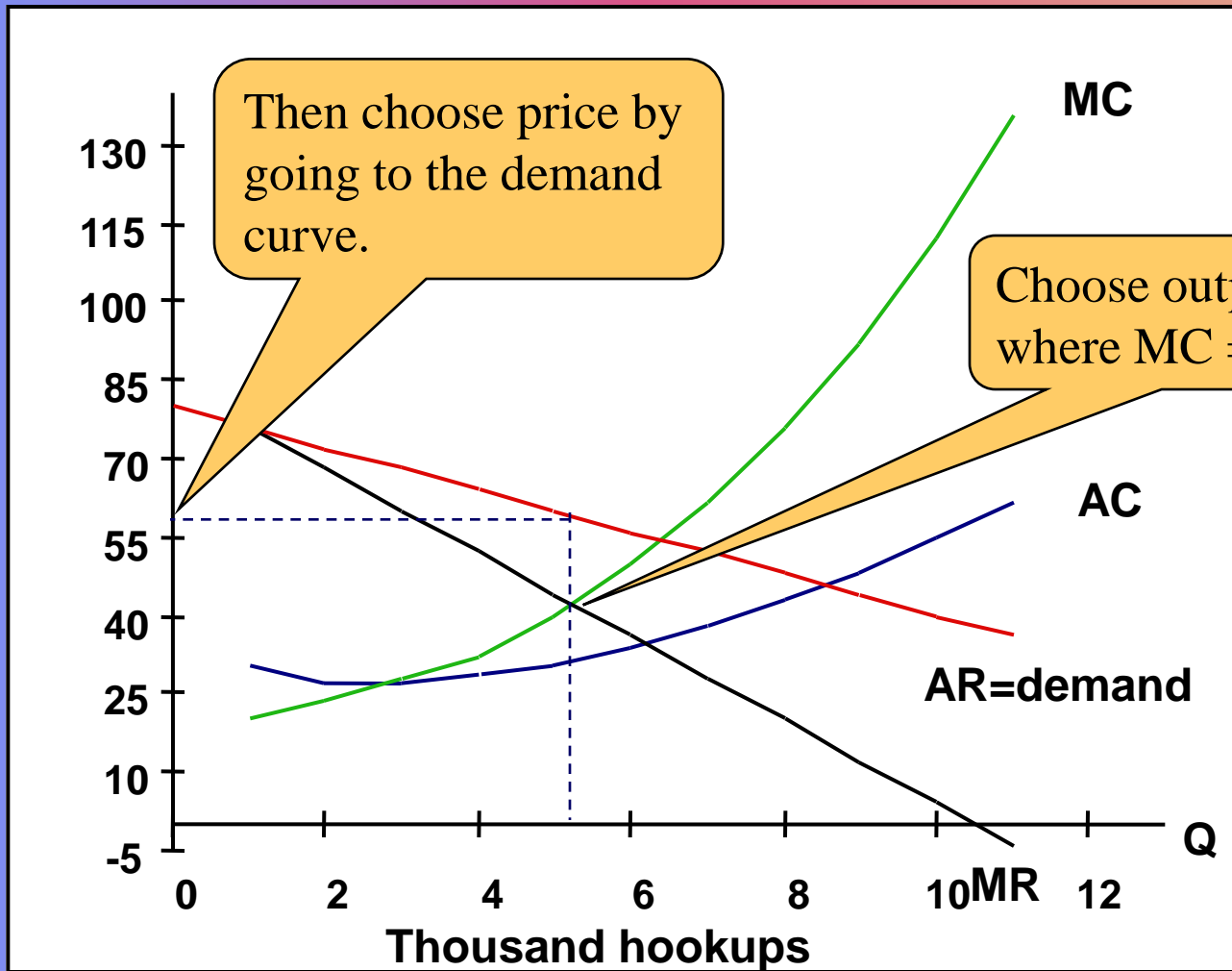


What values of output and price maximize profit for the Ripoff Cable TV Co.?

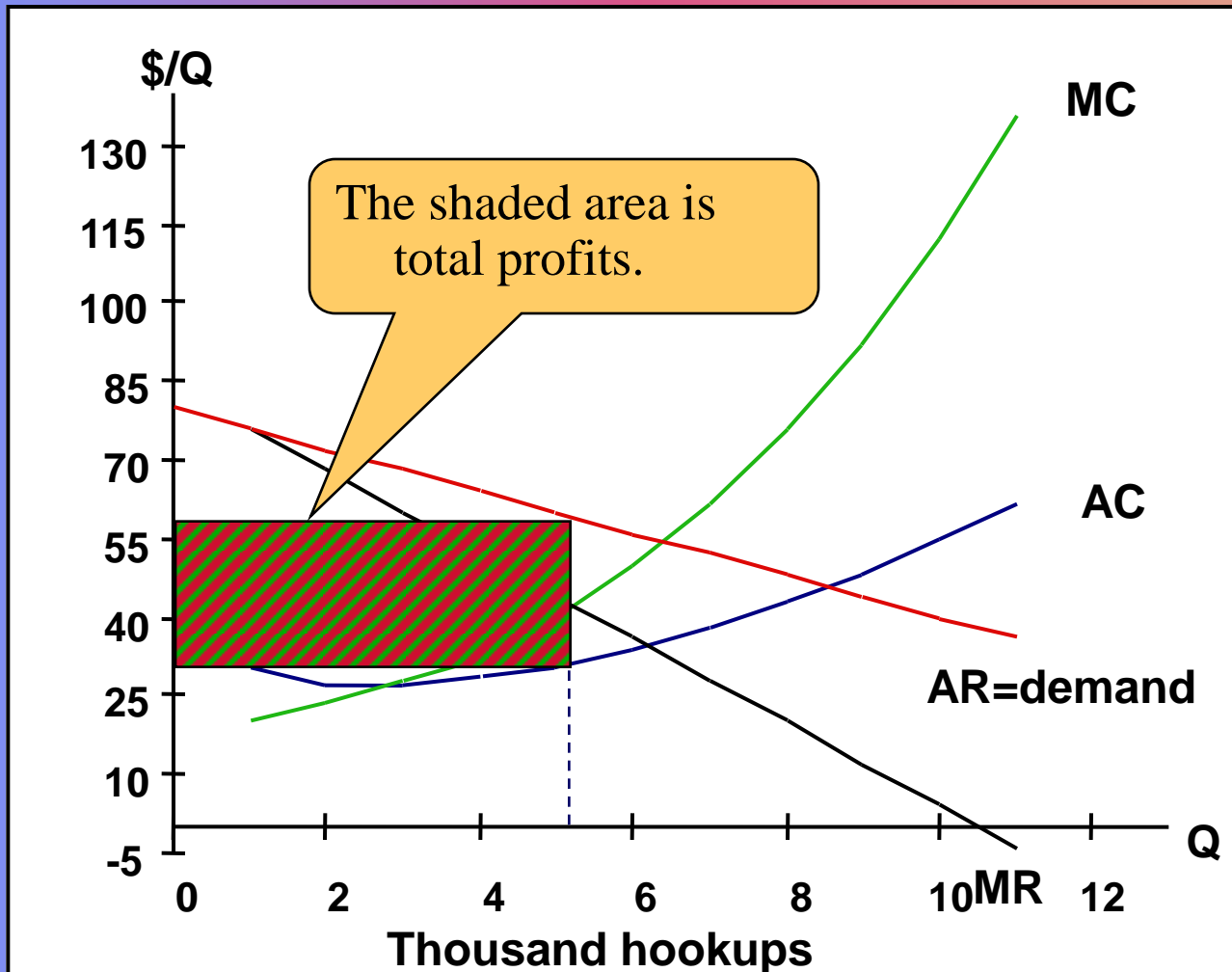


Here are the average and marginal cost and revenue curves for the same problem.

In this case the best output is 5,000 hookups, and the best price is \$60 per month.



To compute the amount of profits in monopoly, find average profit (AR-AC) at the profit maximizing output, and multiply by Q.



## Summary of monopoly pricing:

To maximize profit a monopolist should choose output where  $MC = MR$ .

Price is determined from the demand curve.

Do monopolists choose the best output and price from society's point of view?

Another way to ask the question is whether the monopolist operates in society's interest, and if not, what can be done to remedy the evils of monopoly.

This requires us to formulate some rule for determining when social welfare is improved by some change, and when social welfare is maximized.

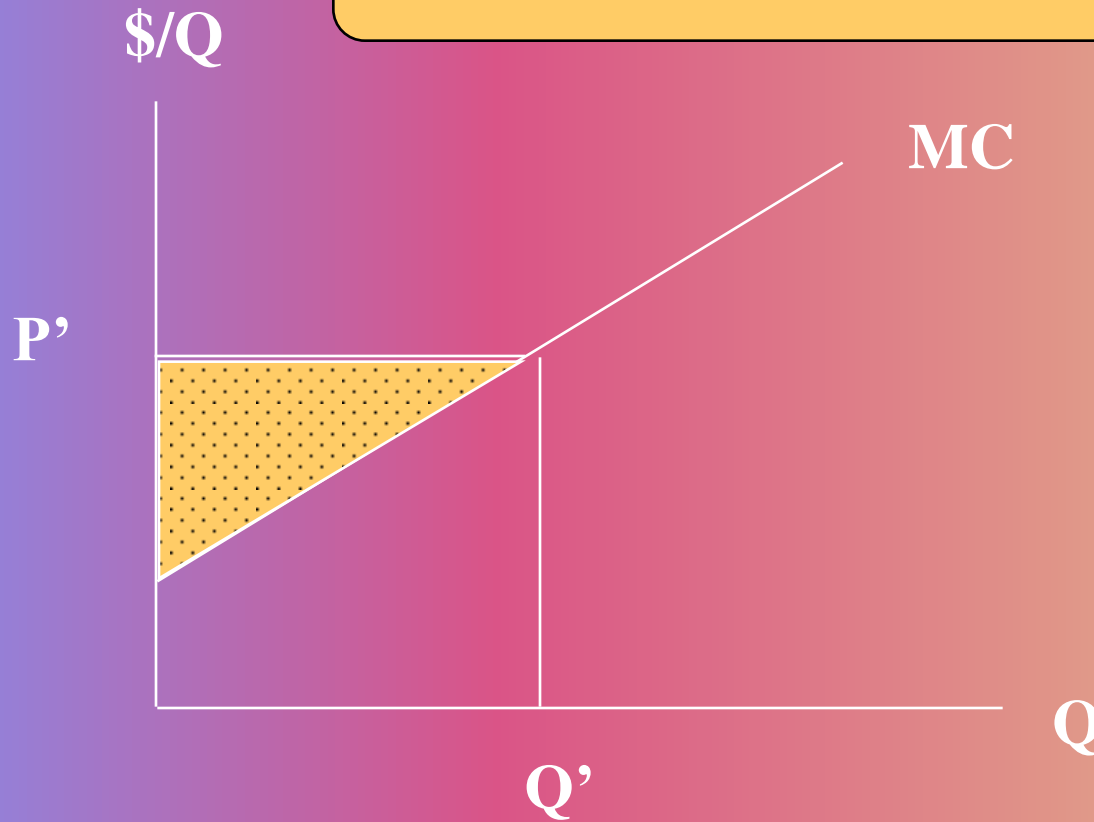
The rule we'll use is that social welfare is measured by the sum of producer and consumer surplus. So society ought to produce where the sum of producer and consumer surplus is as large as possible.



# *Producer Surplus*

PS is the difference between what producers take in (TR) at a given level of production and the minimum amount they would accept for producing that level of output.

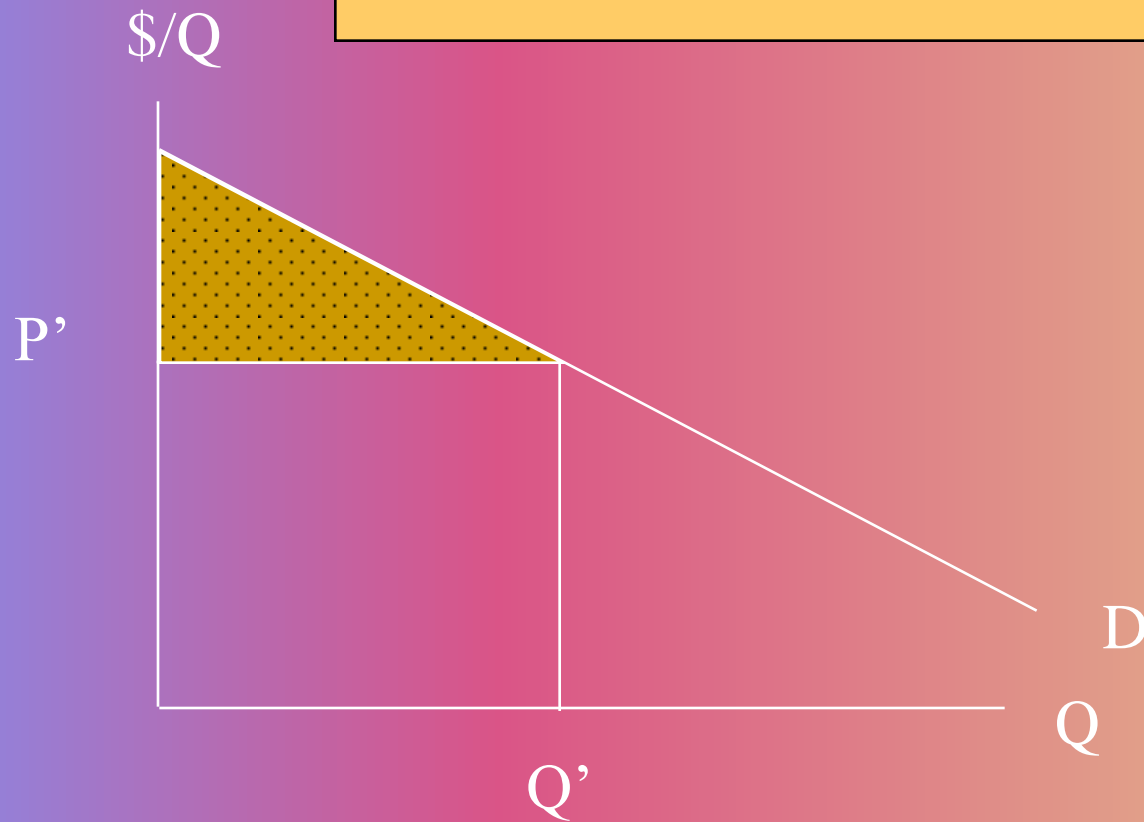
AT P' AND Q', THE PS IS THE SHADED AREA.



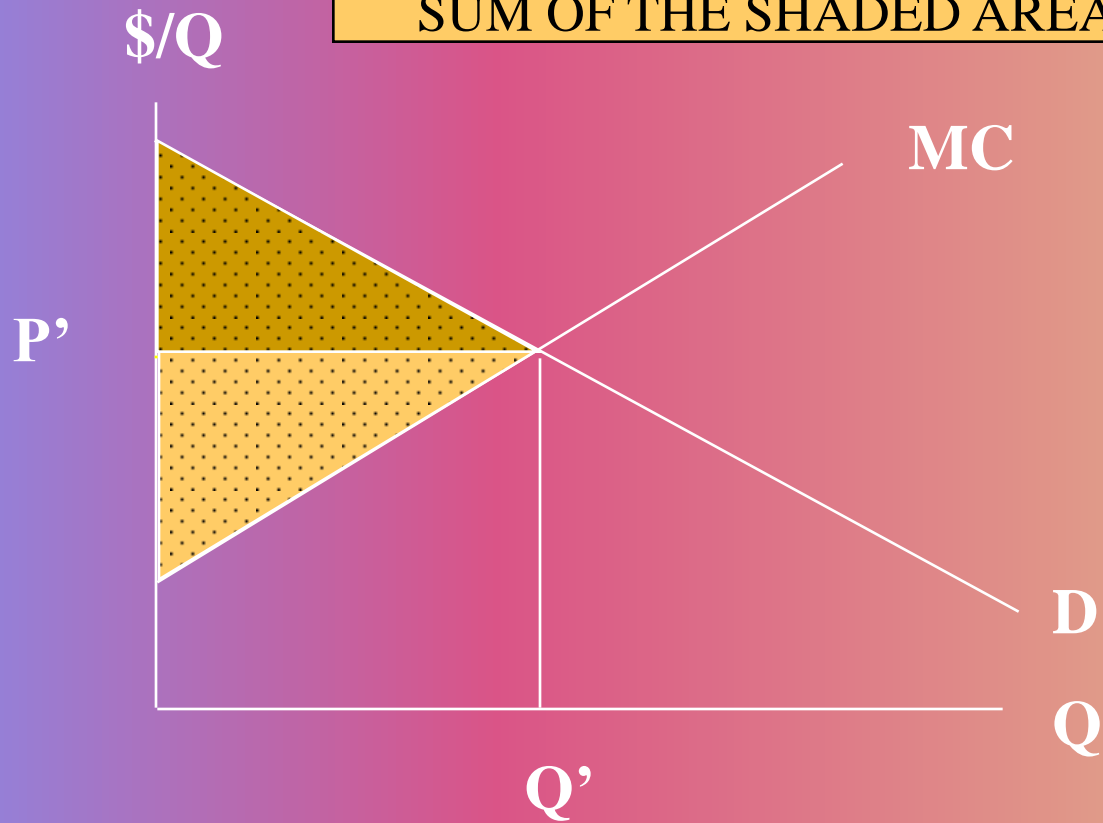
# *Consumer Surplus*

CS is the difference between what consumers pay for a given quantity and the maximum amount they are willing to pay.

AT P' AND Q', THE CS IS THE  
SHADED AREA.



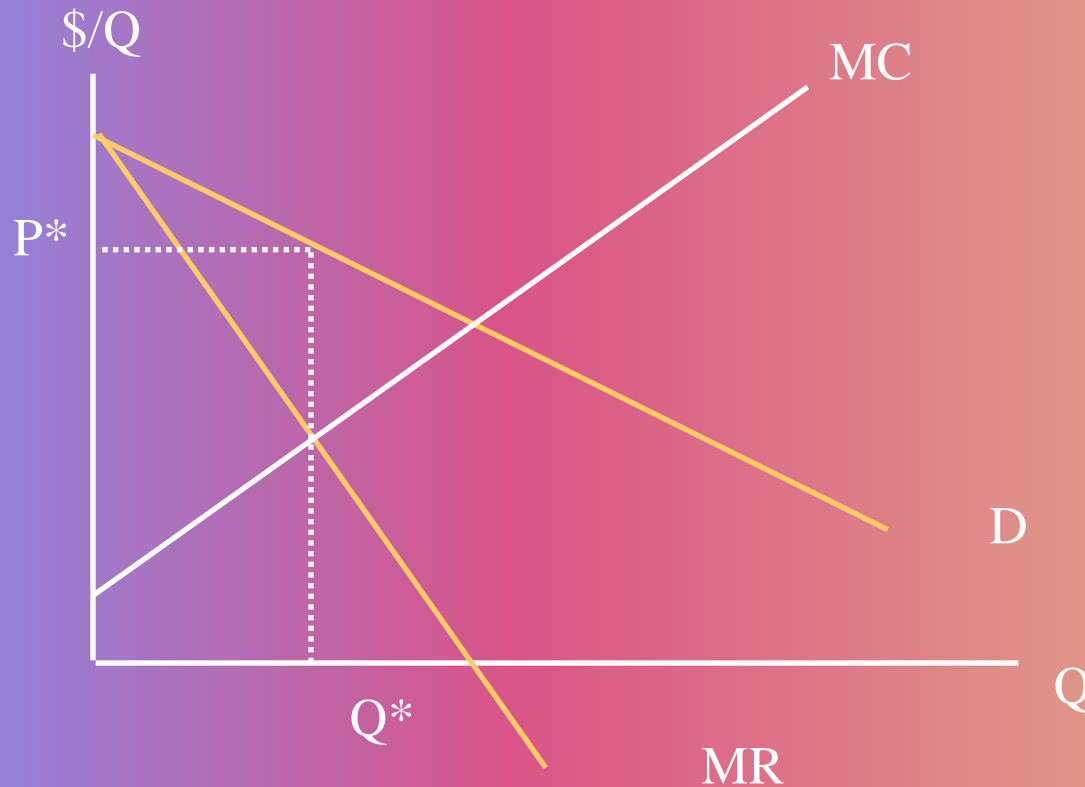
AT P' AND Q', THE WELFARE IS THE SUM OF THE SHADED AREAS.



THE SUM OF PRODUCER AND CONSUMER SURPLUS IS MAXIMIZED WHERE THE MARGINAL COST CURVE INTERSECTS THE DEMAND CURVE.

Here's our friendly local monopolist the Ripoff Cable TV Co. of East Lansing. The profit maximizing output is  $Q^*$ , and the profit maximizing price is  $p^*$ .

The following hidden slides illustrate the computation of surplus at the monopolist's output, and the deadweight loss due to monopoly.



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## *GENERAL RULE:*

The socially best output is where marginal cost equals price -- where the marginal cost curve cuts through the demand curve.

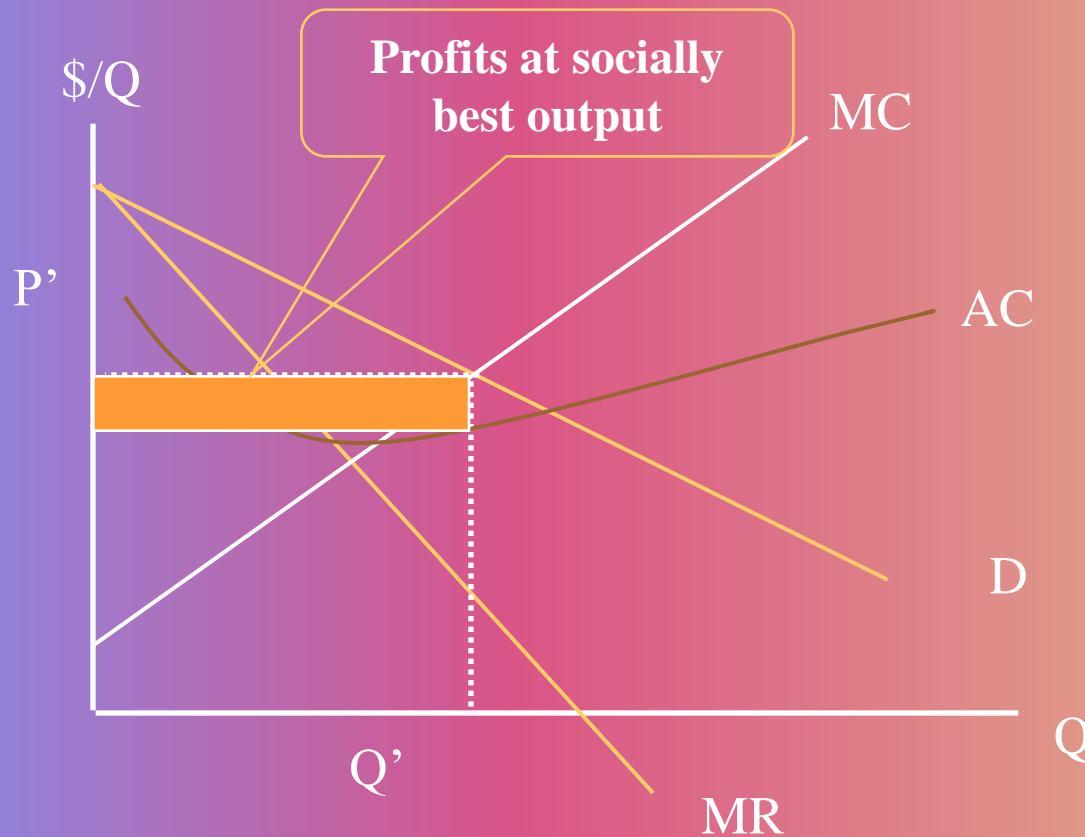
When the socially best output is being produced, the right amount of resources are being devoted to the good.



We can now see why monopoly is bad: It results in less than the optimal amount of a good being produced.

Monopolists produce too little of a good and sell it at too high a price.

Note that at the socially best output and price, the firm is still able to earn positive profits ( $p > AC$ ). This shows that it is not the level of profits that economists object to about a monopolist's behavior.



Producing where marginal cost equals price in order to maximize social welfare is called marginal cost pricing.

Another method for finding the best output takes a different approach, using the concepts of marginal social benefit and marginal social cost.

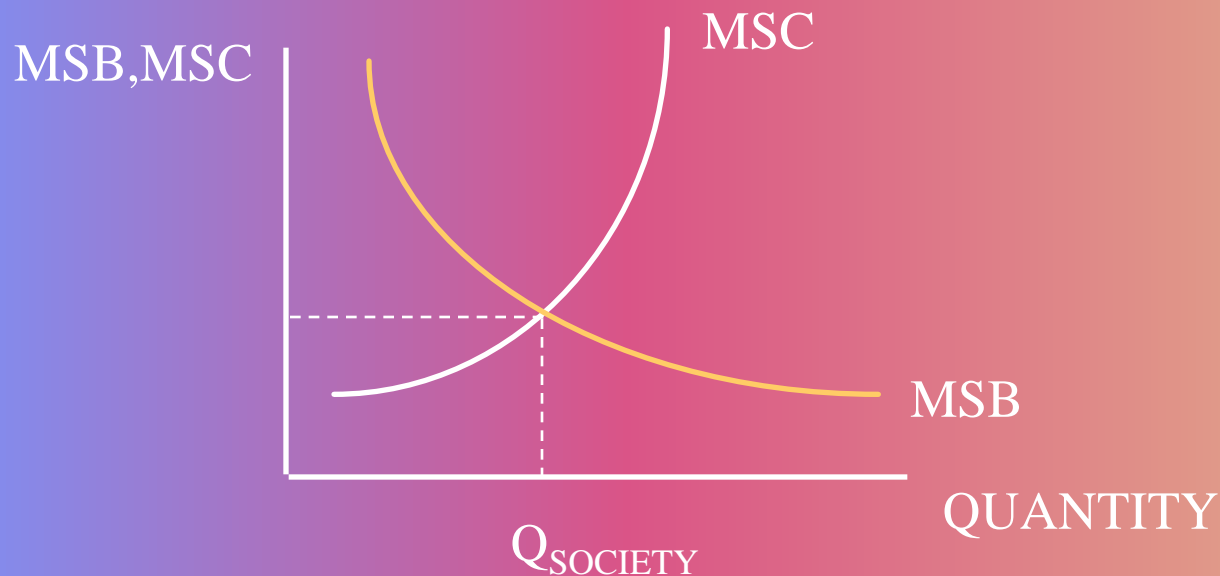
## *DEFINITIONS:*

Marginal social benefit (MSB): The MSB is the increase in social welfare that results from consuming another unit of a good.

Marginal social cost (MSC): The MSC is the cost to society of producing another unit of a good.

# *OPERATING PRINCIPLE:*

Social welfare will be maximized if a good is produced (and consumed) up to the point where marginal social benefit equals marginal social cost.



The problem with this rule is that we don't have any foolproof way of measuring MSB and MSC.

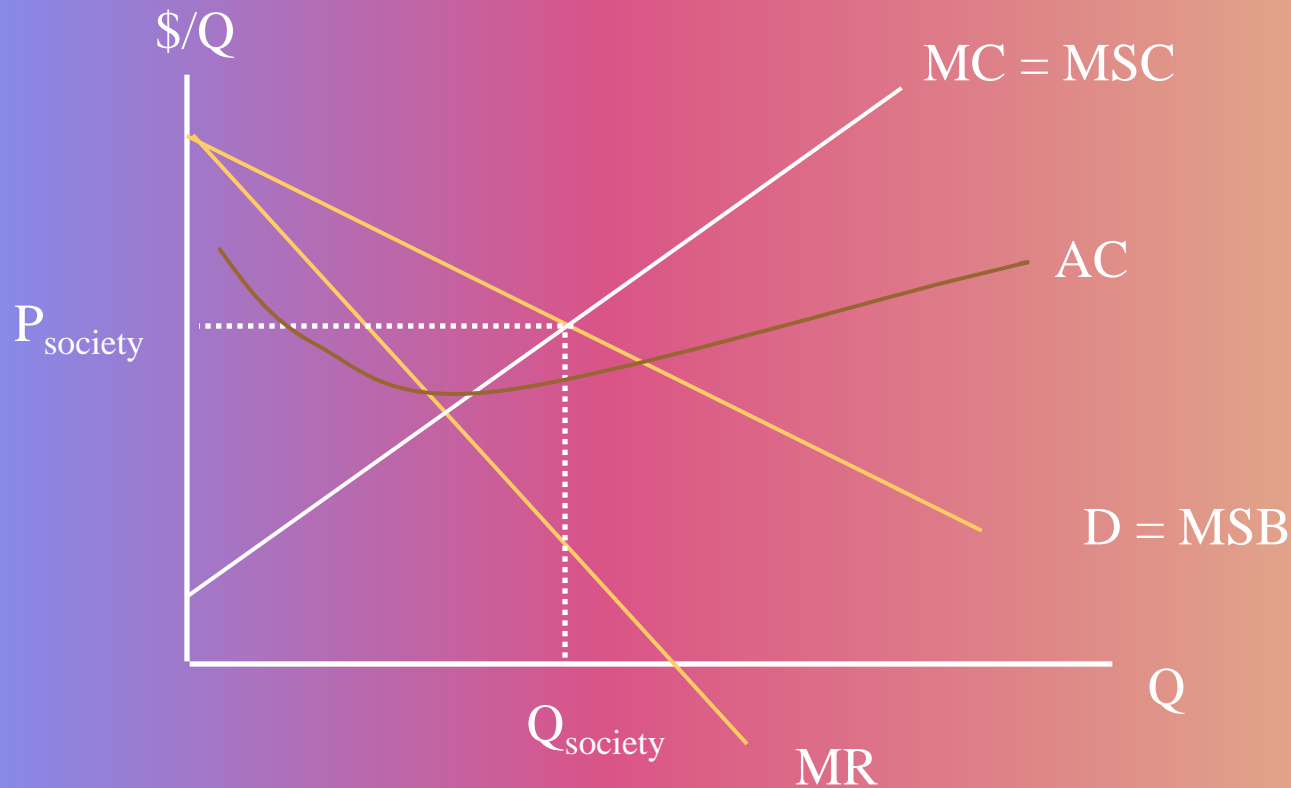
But all is not lost!

Suppose it were true that a good's price is a good measure of MSB.

And suppose that a firm's marginal cost curve is a good measure of MSC.

Then  $MSB = MSC$  boils down to producing where  $MC = P$ , our rule for welfare maximization.

If the firm's MC curve is a good measure of MSC, and if its demand (AR) curve is a good measure of MSB, then the best output will be where  $MC = P$ .



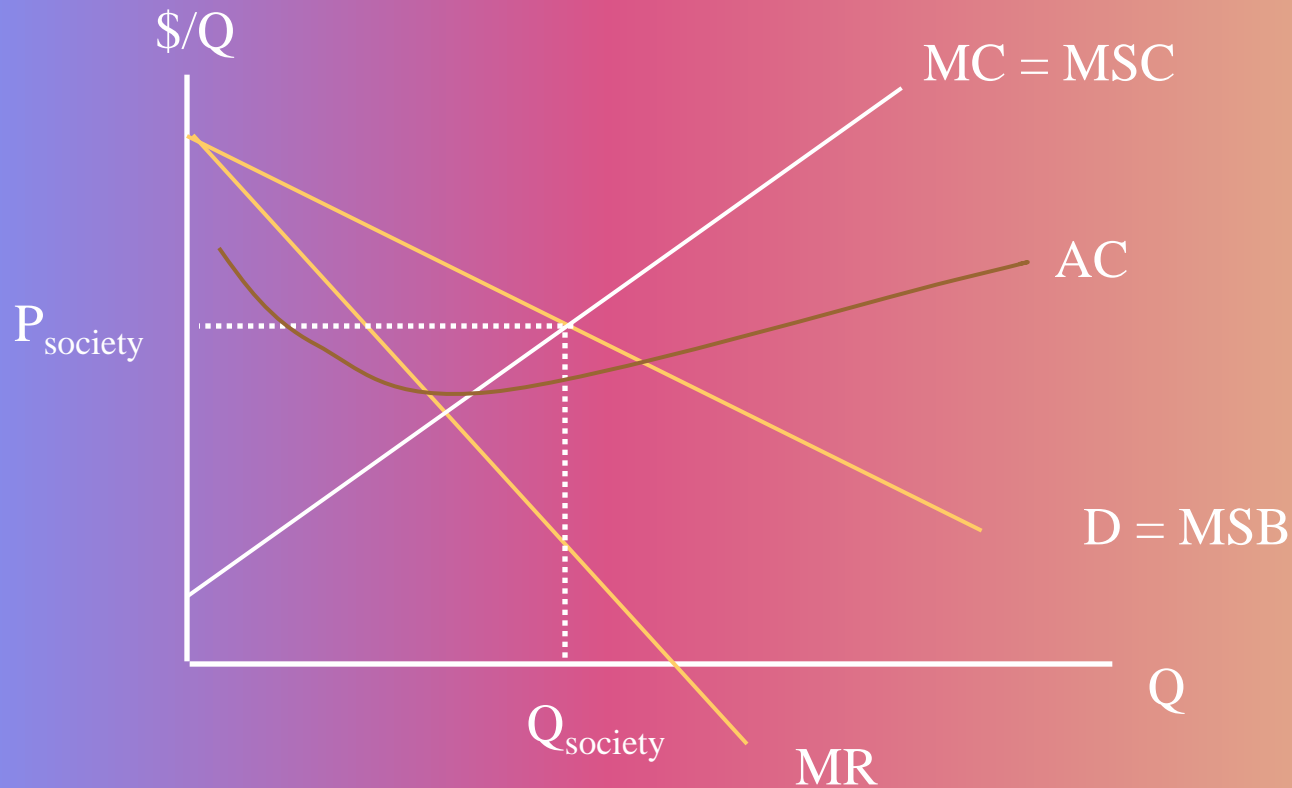


## *How could this work in practice?*

In regulating a monopolist we would need information on market demand and on the firm's marginal cost at each level of output.

We could make the monopolist produce the best output with a series of taxes or subsidies, or even by direct regulation (price setting by a regulator).

In this case equality between MSC and MSB means having marginal cost equal to price ( $MC = P$ ).



# *Monopoly summary*

To maximize profit, the monopolist will produce where  
 $MC = MR$ .

From society's point of view monopolists produce too small an output, and sell it at too high a price.

The best output from society's point of view is where  
 $MC = P$ .

We can measure the deadweight loss due to monopoly as the (roughly) triangular area between the MC curve and the demand curve.

# *Price Discrimination*

**Definition:** A situation in which the producer sells different units of the same good to different consumers at different prices.

The idea here is that some consumers pay high prices and some pay lower prices for the same good or service.

To be successful, a producer must have some way to keep the markets separate.

## *Price discrimination example*

Suppose a monopolistic producer of electricity sells in two markets, residential and commercial. The demand curves differ in the two markets.

How should any quantity be divided between the markets if total revenue is to be maximized?

Rule:

To maximize TR, sell quantities in the two markets so that the marginal revenue in market 1 equals marginal revenue in market 2.

Then set prices accordingly.

Reasoning:

If MR in one of the markets were higher, then a unit of output could be switched from the lower to the higher MR market. There would be an increase in TR as a result.

But how much total output should the firm produce?

It should produce where MR equals MC.