

CHAPTER 7

Consumers, Producers, and the Efficiency of Markets

PRINCIPLES OF
Economics
N. Gregory Mankiw

Welfare Economics

- Recall, the **allocation of resources** refers to:
 - how much of each good is produced
 - which producers produce it
 - which consumers consume it
- () **economics** studies how the allocation of resources affects economic well-being.
- First, we look at the well-being of consumers.

Willingness to Pay (WTP)

A buyer's () **to pay** for a good is the maximum amount the buyer will pay for that good.

WTP measures how much the buyer values the good.

<i>name</i>	<i>WTP</i>
Anthony	\$250
Chad	175
Flea	300
John	125

Example:
4 buyers' WTP
for an iPod

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WTP and the Demand Curve

Q: If price of iPod is \$200, who will buy an iPod, and what is quantity demanded?

A: Anthony & Flea will buy an iPod,
Chad & John will not.

<i>name</i>	<i>WTP</i>
Anthony	\$250
Chad	175
Flea	300
John	125

Hence, $Q^d = 2$
when $P = \$200$.

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WTP and the Demand Curve

Derive the demand schedule:

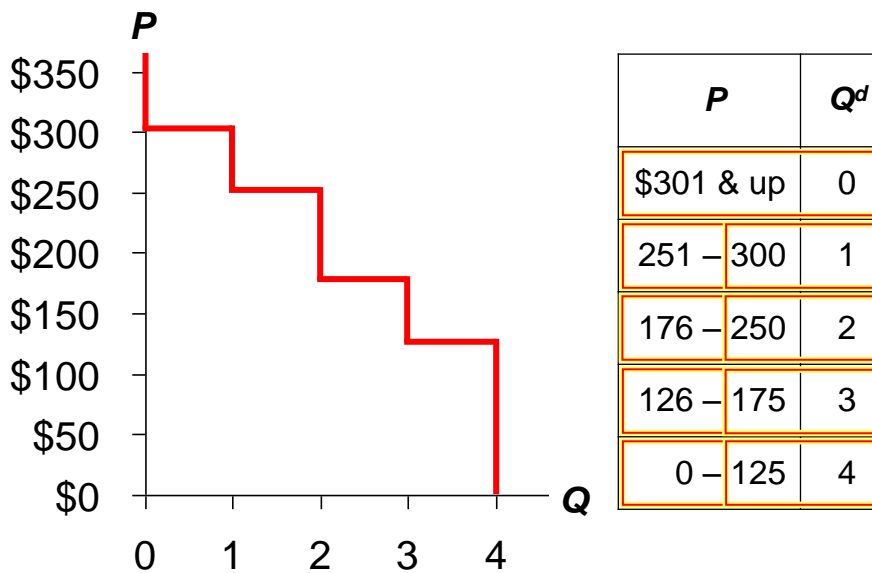
<i>name</i>	<i>WTP</i>
Anthony	\$250
Chad	175
Flea	300
John	125

<i>P</i> (price of iPod)	who buys	Q^d
\$301 & up	nobody	0
251 – 300	Flea	1
176 – 250	Anthony, Flea	2
126 – 175	Chad, Anthony, Flea	3
0 – 125	John, Chad, Anthony, Flea	4

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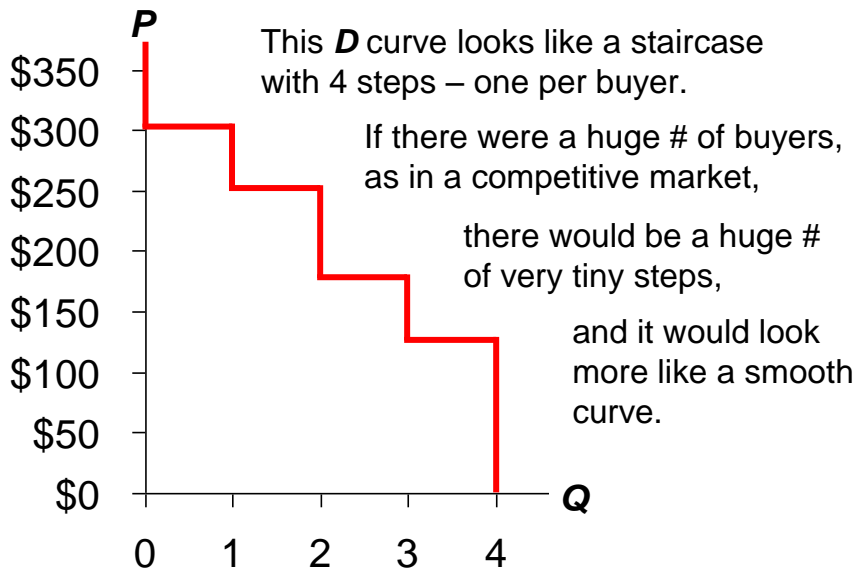
WTP and the Demand Curve



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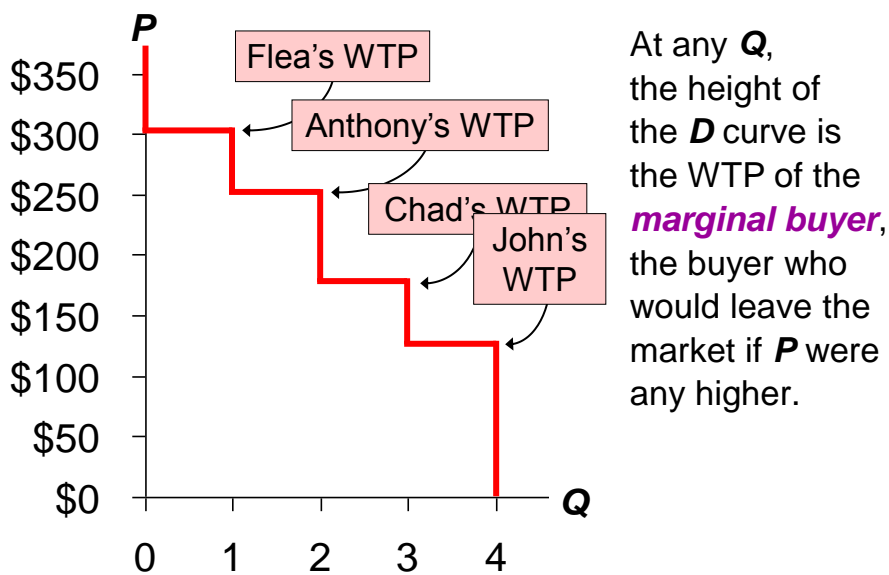
About the Staircase Shape...



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WTP and the Demand Curve



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Consumer Surplus (CS)

() is the amount a buyer is willing to pay minus the amount the buyer actually pays:

$$CS = WTP - P$$

name	WTP
Anthony	\$250
Chad	175
Flea	300
John	125

Suppose $P = \$260$.

Flea's CS = $\$300 - 260 = \40 .

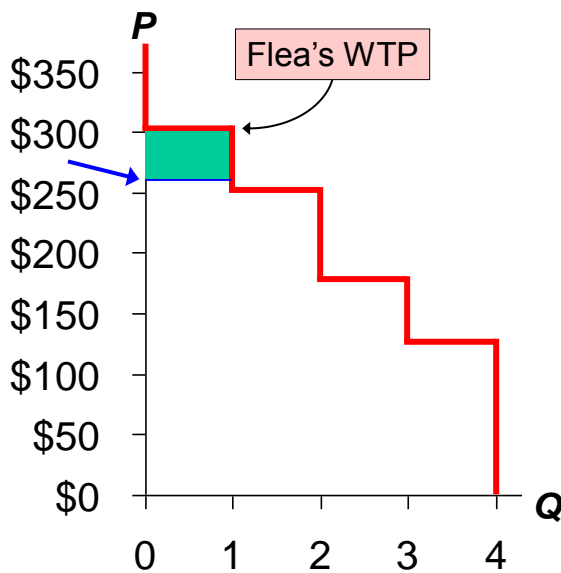
The others get no CS because they do not buy an iPod at this price.

Total CS = $\$40$.

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CS and the Demand Curve



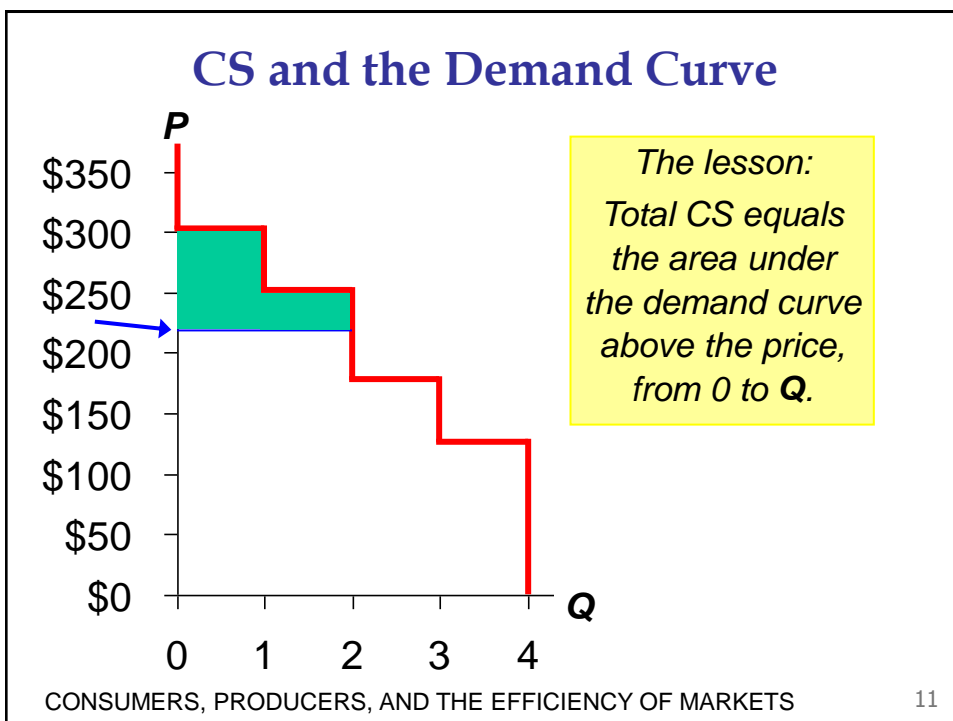
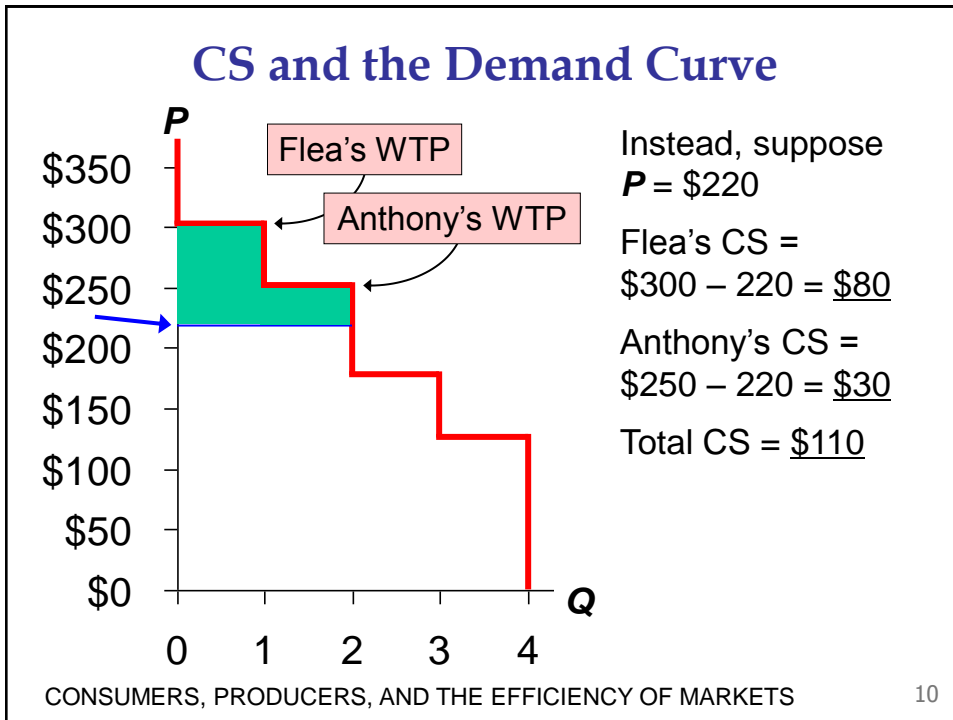
$P = \$260$

Flea's CS =
 $\$300 - 260 = \underline{\$40}$

Total CS = $\$40$

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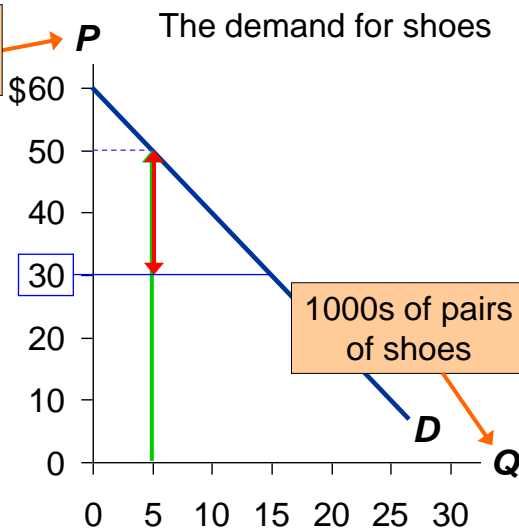


CS with Lots of Buyers & a Smooth D Curve

At $Q = 5$ (thousand) the marginal buyer is willing to pay \$50 for pair of shoes.

Suppose $P = \$30$.

Then his consumer surplus = \$20.



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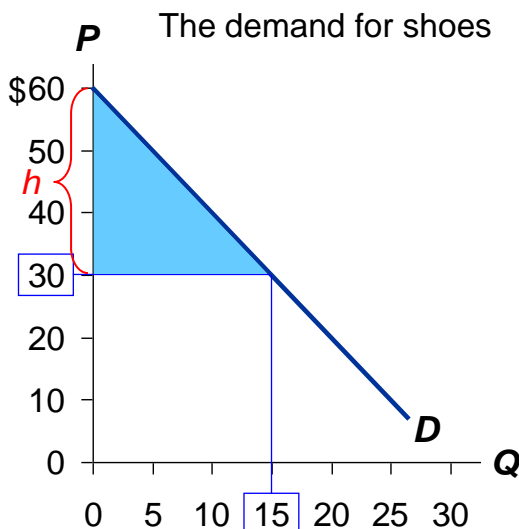
CS with Lots of Buyers & a Smooth D Curve

CS is the area b/w P and the D curve, from 0 to Q .

Recall: area of a triangle equals $\frac{1}{2} \times \text{base} \times \text{height}$

Height =
 $\$60 - 30 = \underline{\$30}$.

So,
 $CS = \frac{1}{2} \times 15 \times \30
 $= \underline{\$225}$.



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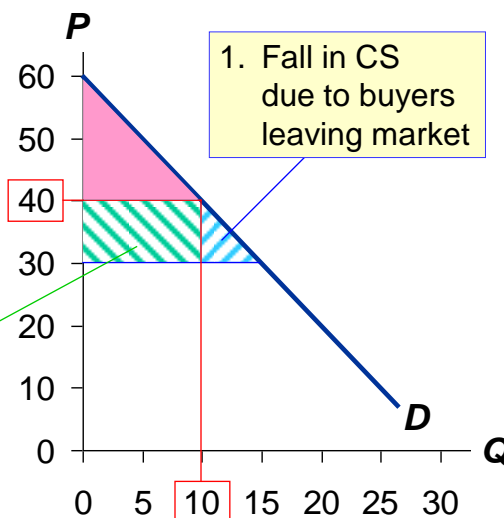
How a Higher Price Reduces CS

If P rises to \$40,

$$CS = \frac{1}{2} \times 10 \times \$20 = \$100.$$

Two reasons for the fall in CS.

2. Fall in CS due to remaining buyers paying higher P



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Cost and the Supply Curve

- () is the value of everything a seller must give up to produce a good (*i.e.*, opportunity cost).
- Includes cost of all resources used to produce good, including value of the seller's time.
- Example: Costs of 3 sellers in the lawn-cutting business.

<i>name</i>	<i>cost</i>
Jack	\$10
Janet	20
Chrissy	35

A seller will produce and sell the good/service only if the price exceeds his or her cost.

Hence, cost is a measure of willingness to sell.

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Cost and the Supply Curve

Derive the supply schedule
from the cost data:

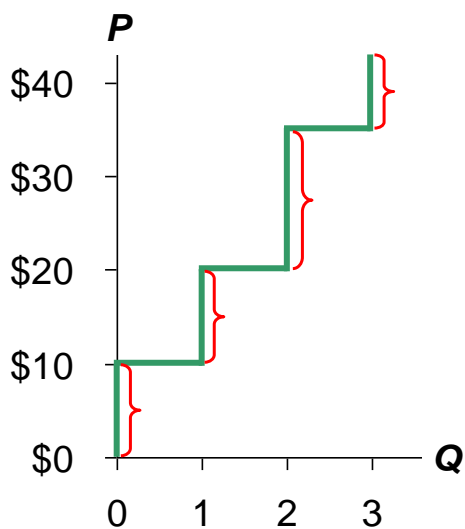
<i>name</i>	<i>cost</i>
Jack	\$10
Janet	20
Chrissy	35

<i>P</i>	<i>Q^s</i>
\$0 – 9	0
10 – 19	1
20 – 34	2
35 & up	3

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Cost and the Supply Curve

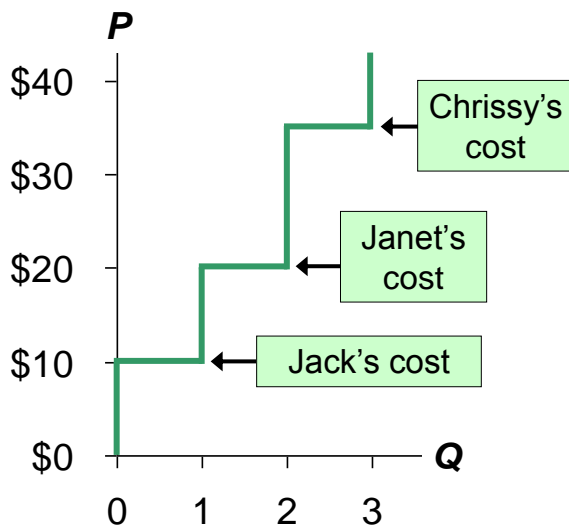


<i>P</i>	<i>Q^s</i>
\$0 – 9	0
10 – 19	1
20 – 34	2
35 & up	3

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Cost and the Supply Curve

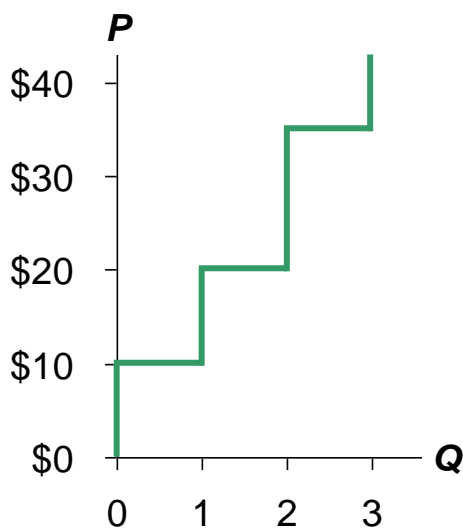


At each Q , the height of the S curve is the cost of the **marginal seller**, the seller who would leave the market if the price were any lower.

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Producer Surplus



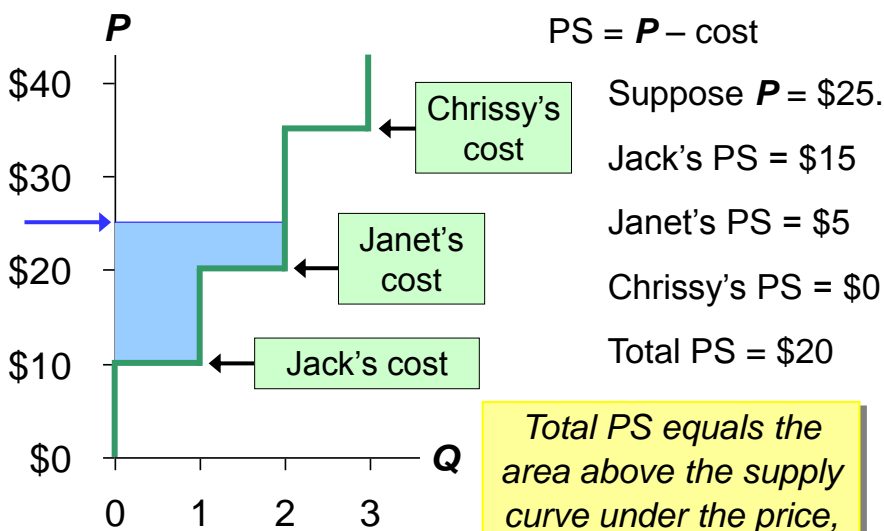
$$PS = P - \text{cost}$$

Producer surplus (PS): the amount a seller is paid for a good minus the seller's cost

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Producer Surplus and the S Curve



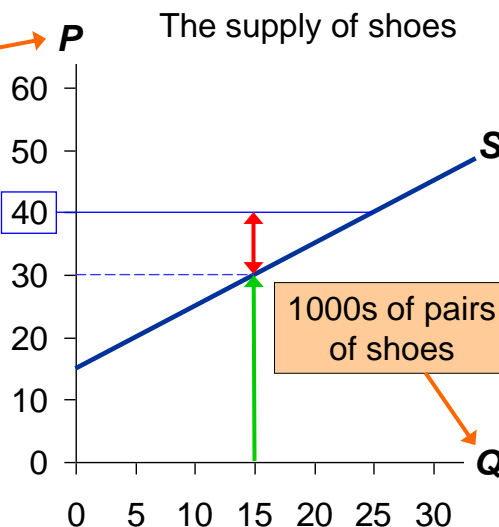
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PS with Lots of Sellers & a Smooth S Curve

Suppose $P = \$40$ (Price per pair)

At $Q = 15$ (thousand), the marginal seller's cost is \$30, and her producer surplus is \$10.



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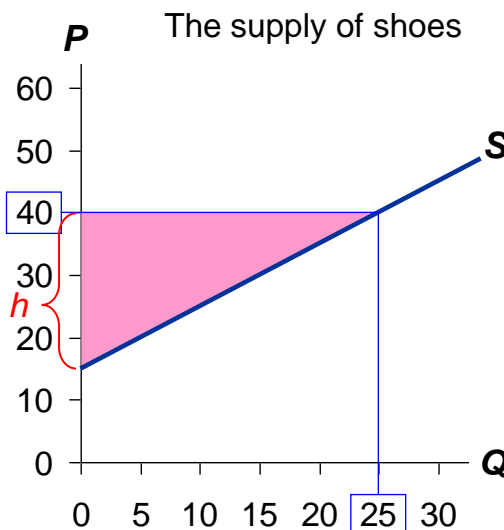
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PS with Lots of Sellers & a Smooth S Curve

PS is the area b/w P and the S curve, from 0 to Q .

The height of this triangle is
 $\$40 - 15 = \25 .

So,
 $PS = \frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 25 \times \25
 $= \underline{\$312.50}$



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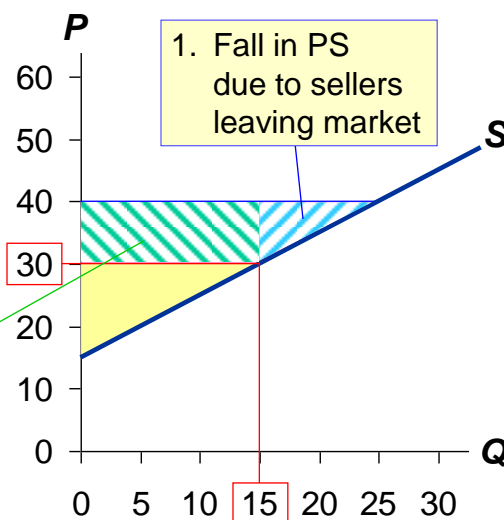
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How a Lower Price Reduces PS

If P falls to $\$30$,
 $PS = \frac{1}{2} \times 15 \times \15
 $= \underline{\$112.50}$

Two reasons for the fall in PS.

2. Fall in PS due to remaining sellers getting lower P



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CS, PS, and Total Surplus

CS = (value to buyers) – (amount paid by buyers)
 = buyers' gains from participating in the market

PS = (amount received by sellers) – (cost to sellers)
 = sellers' gains from participating in the market

(**) surplus** = CS + PS
 = total gains from trade in a market
 = (value to buyers) – (cost to sellers)

The Market's Allocation of Resources

- In a market economy, the allocation of resources is decentralized, determined by the interactions of many self-interested buyers and sellers.
- Is the market's allocation of resources desirable? Or would a different allocation of resources make society better off?
- To answer this, we use total surplus as a measure of society's well-being, and we consider whether the market's allocation is *efficient*.
 (Policymakers also care about *equality*, though the focus here is on efficiency.)

Efficiency

$$\text{Total surplus} = (\text{value to buyers}) - (\text{cost to sellers})$$

An allocation of resources is **efficient** if it maximizes total surplus. Efficiency means:

- The goods are consumed by the buyers who value them most highly.
- The goods are produced by the producers with the lowest costs.
- Raising or lowering the quantity of a good would not increase total surplus.

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Evaluating the Market Equilibrium

Market eq'm:

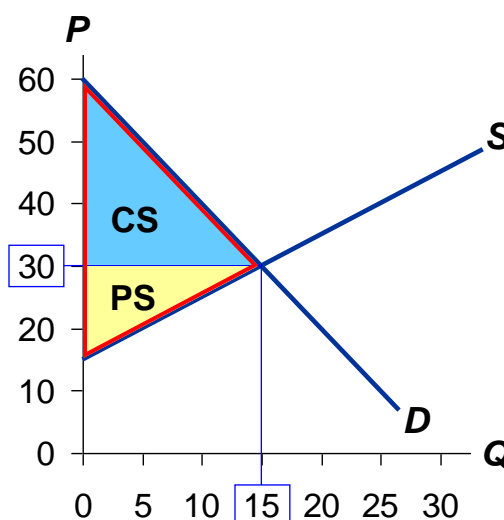
$$P = \$30$$

$$Q = 15,000$$

Total surplus

$$= CS + PS$$

Is the market eq'm efficient?



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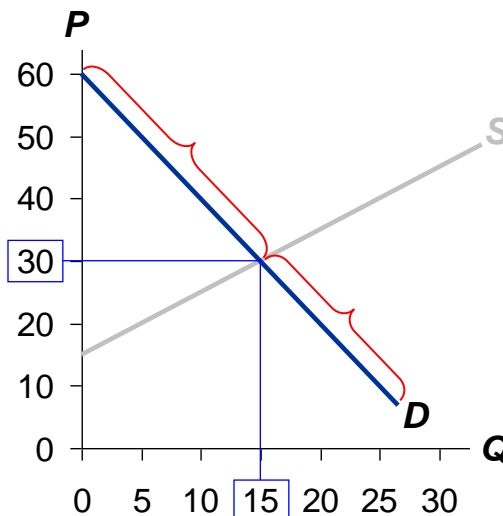
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Which Buyers Consume the Good?

Every buyer whose WTP is $\geq \$30$ will buy.

Every buyer whose WTP is $< \$30$ will not.

So, ***the buyers who value the good most highly are the ones who consume it.***



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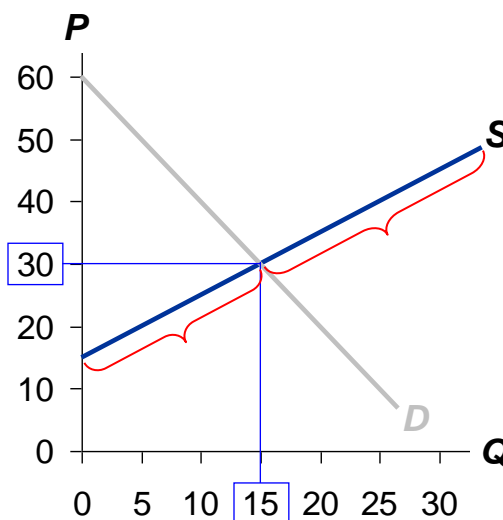
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Which Sellers Produce the Good?

Every seller whose cost is $\leq \$30$ will produce the good.

Every seller whose cost is $> \$30$ will not.

So, ***the sellers with the lowest cost produce the good.***



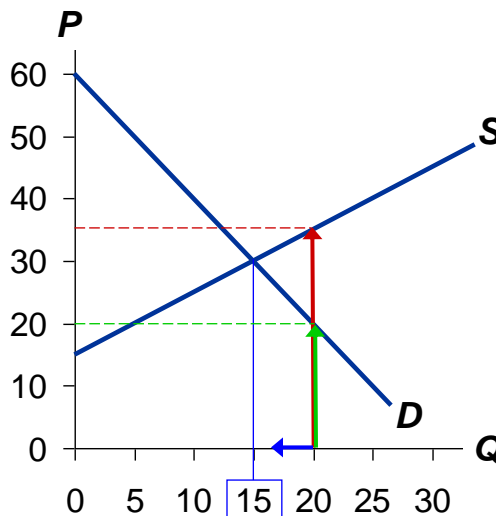
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Does Eq'm Q Maximize Total Surplus?

At $Q = 20$,
 cost of producing
 the marginal unit
 is \$35
 value to consumers
 of the marginal unit
 is only \$20
 Hence, can increase
 total surplus
 by reducing Q .

*This is true at any Q
 greater than 15.*



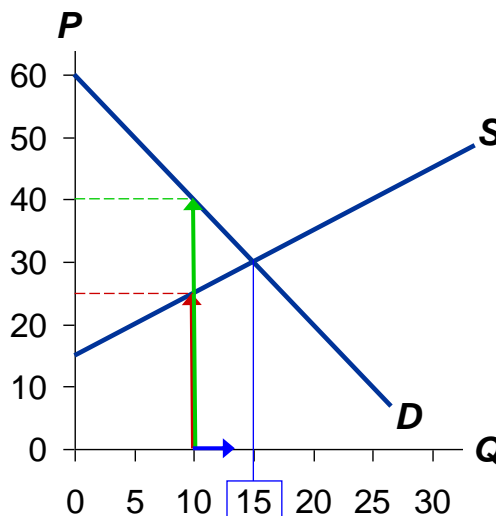
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Does Eq'm Q Maximize Total Surplus?

At $Q = 10$,
 cost of producing
 the marginal unit
 is \$25
 value to consumers
 of the marginal unit
 is \$40
 Hence, can increase
 total surplus
 by increasing Q .

*This is true at any Q
 less than 15.*

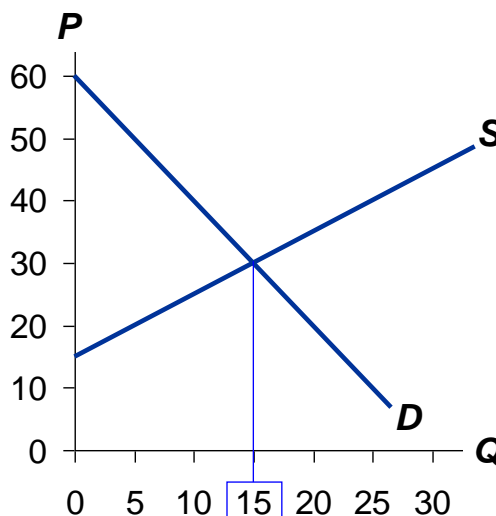


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Does Eq'm Q Maximize Total Surplus?

The market eq'm quantity maximizes total surplus: At any other quantity, can increase total surplus by moving toward the market eq'm quantity.



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The Free Market vs. Govt Intervention

- The market equilibrium is efficient. No other outcome achieves higher total surplus.
- Govt cannot raise total surplus by changing the market's allocation of resources.
- **Laissez faire** (French for "allow them to do"): the notion that govt should not interfere with the market.

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The free market vs. central planning

- Suppose resources were allocated not by the market, but by a central planner who cares about society's well-being.
- To allocate resources efficiently and maximize total surplus, the planner would need to know every seller's cost and every buyer's WTP for every good in the entire economy.
- This is impossible, and why centrally-planned economies are never very efficient.

CONCLUSION

- This chapter used welfare economics to demonstrate one of the Ten Principles:
Markets are usually a good way to organize economic activity.
- Important note:
We derived these lessons assuming perfectly competitive markets.
- In other conditions we will study in later chapters, the market may fail to allocate resources efficiently...

CONCLUSION

- Such market failures occur when:
 - a buyer or seller has *market power* – the ability to affect the market price.
 - transactions have side effects, called *externalities*, that affect bystanders. (example: pollution)
- We'll use welfare economics to see how public policy may improve on the market outcome in such cases.
- Despite the possibility of market failure, the analysis in this chapter applies in many markets, and the invisible hand remains extremely important.



CHAPTER SUMMARY

- The height of the ***D*** curve reflects the value of the good to buyers—their willingness to pay for it.
- Consumer surplus is the difference between what buyers are willing to pay for a good and what they actually pay.
- On the graph, consumer surplus is the area between ***P*** and the ***D*** curve.



CHAPTER SUMMARY

- The height of the **S** curve is sellers' cost of producing the good. Sellers are willing to sell if the price they get is at least as high as their cost.
- Producer surplus is the difference between what sellers receive for a good and their cost of producing it.
- On the graph, producer surplus is the area between **P** and the **S** curve.

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CHAPTER SUMMARY

- To measure of society's well-being, we use total surplus, the sum of consumer and producer surplus.
- Efficiency means that total surplus is maximized, that the goods are produced by sellers with lowest cost, and that they are consumed by buyers who most value them.
- Under perfect competition, the market outcome is efficient. Altering it would reduce total surplus.

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