

EE211

PRINCIPLES OF MICROECONOMICS

Topic 4:

Consumers, Producers, and the Efficiency of Markets

Topics

- Consumer Surplus
- Producer Surplus
- Market Efficiency

Welfare Economics

- Recall: the allocation of resources refers to:
 - how much of each good is produced
 - which producers produce it
 - which consumers consume it
- **Welfare economics**: the study of how the allocation of resources affects economic well-being
 - Consumer's well-being is measured by **consumer surplus**.
 - Producer's well-being is measured by **producer surplus**.
 - Both contribute to *total surplus (or social welfare)*.

Willingness to Pay (WTP)

- A consumer's **willingness to pay** for a good is the **maximum amount the buyer will pay for that good**.
 - WTP measures how much s/he values the good.
- Example: 4 buyers' WTP for an iPhone

Consumer	WTP
Nadech	\$250
James	175
Ken	300
Boy	125

Suppose the price of an iPhone is \$200.

Q: Who will buy an iPhone?

➔ **Nadech & Ken**

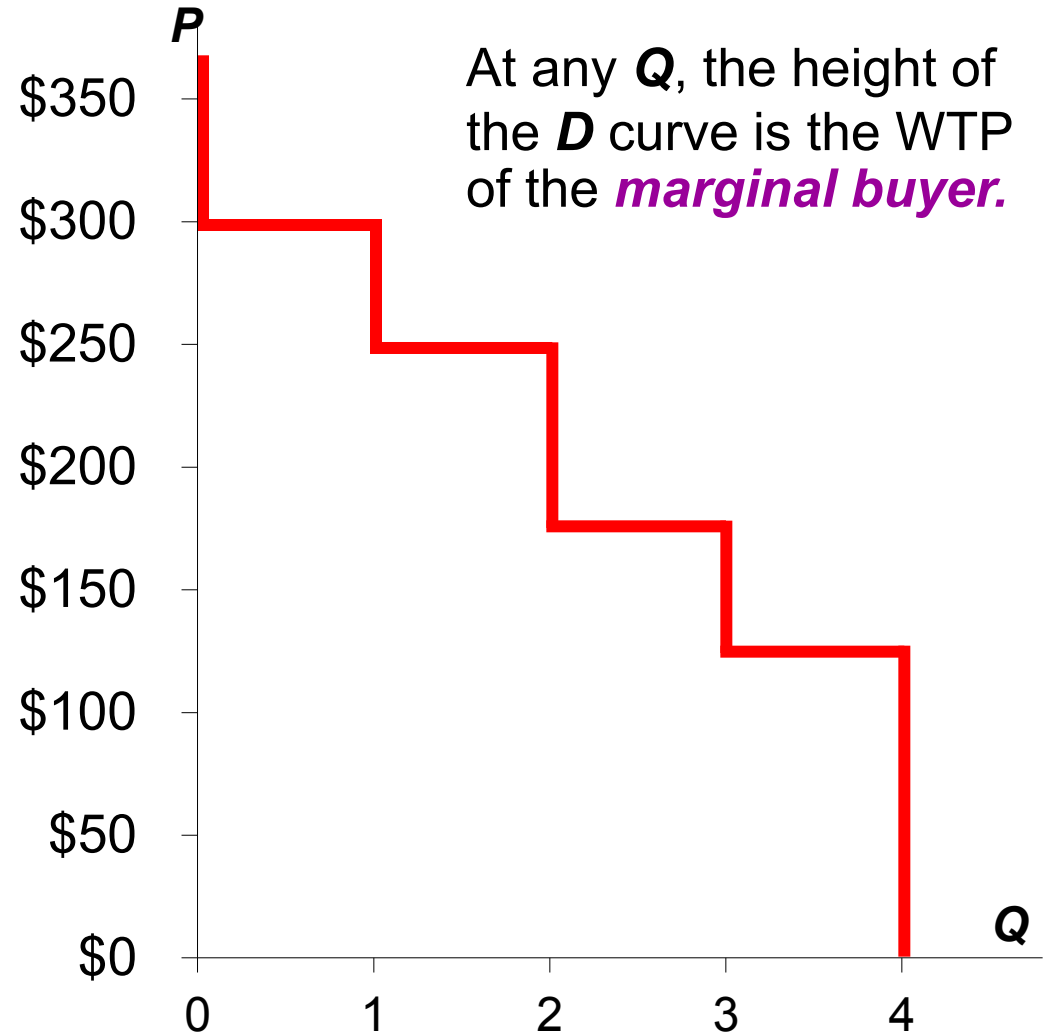
Q: What is quantity demanded?

➔ **$Q_d = 2$**

Deriving the Demand Curve

Consumer	WTP
Nadech	\$250
James	175
Ken	300
Boy	125

P	Q^d
\$301+	0
251 – 300	1
176 – 250	2
126 – 175	3
0 – 125	4



Consumer Surplus

- **Consumer surplus (CS)** is the difference between what a consumer is willing to pay and what s/he actually pays.
- Mathematically, $CS = WTP - P$.
- Example:

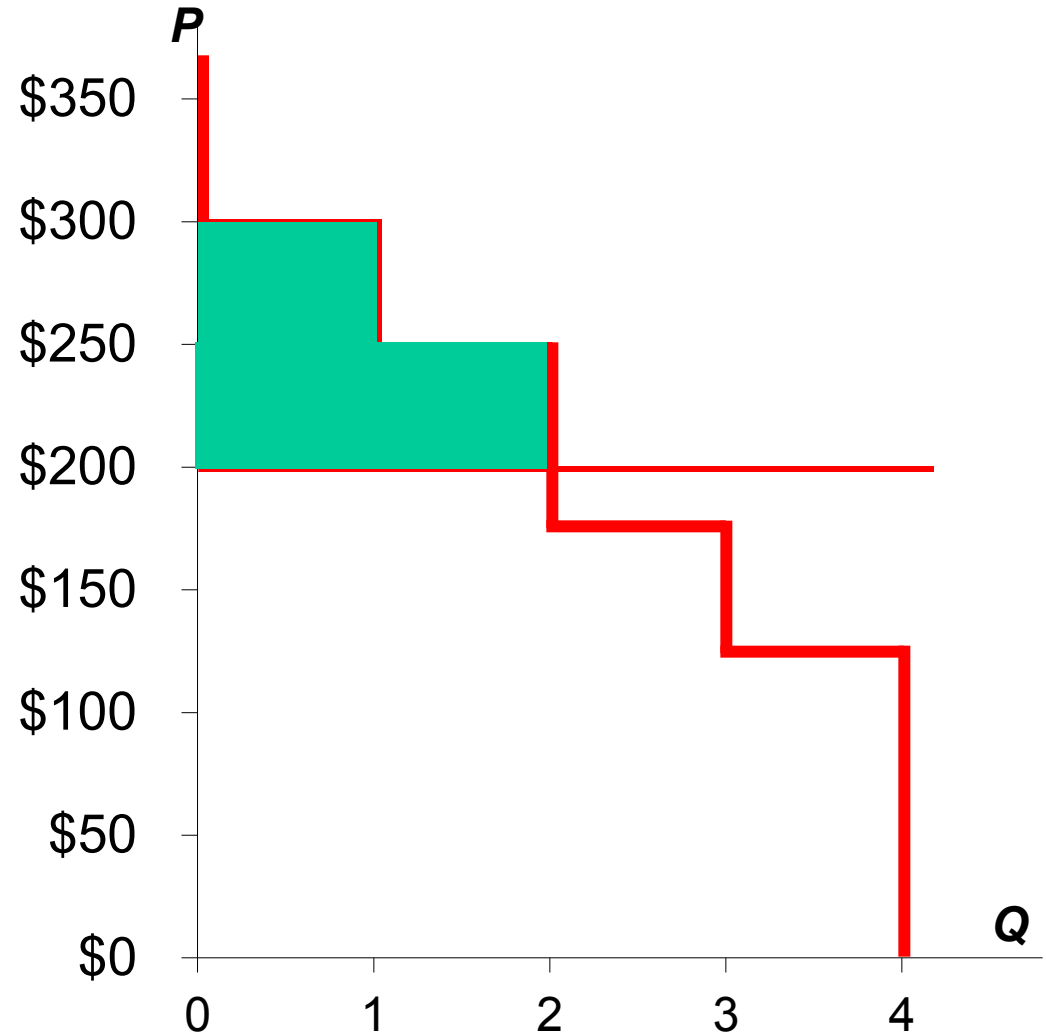
Consumer	WTP
Nadech	\$250
James	175
Ken	300
Boy	125

Suppose $P = \$200$.

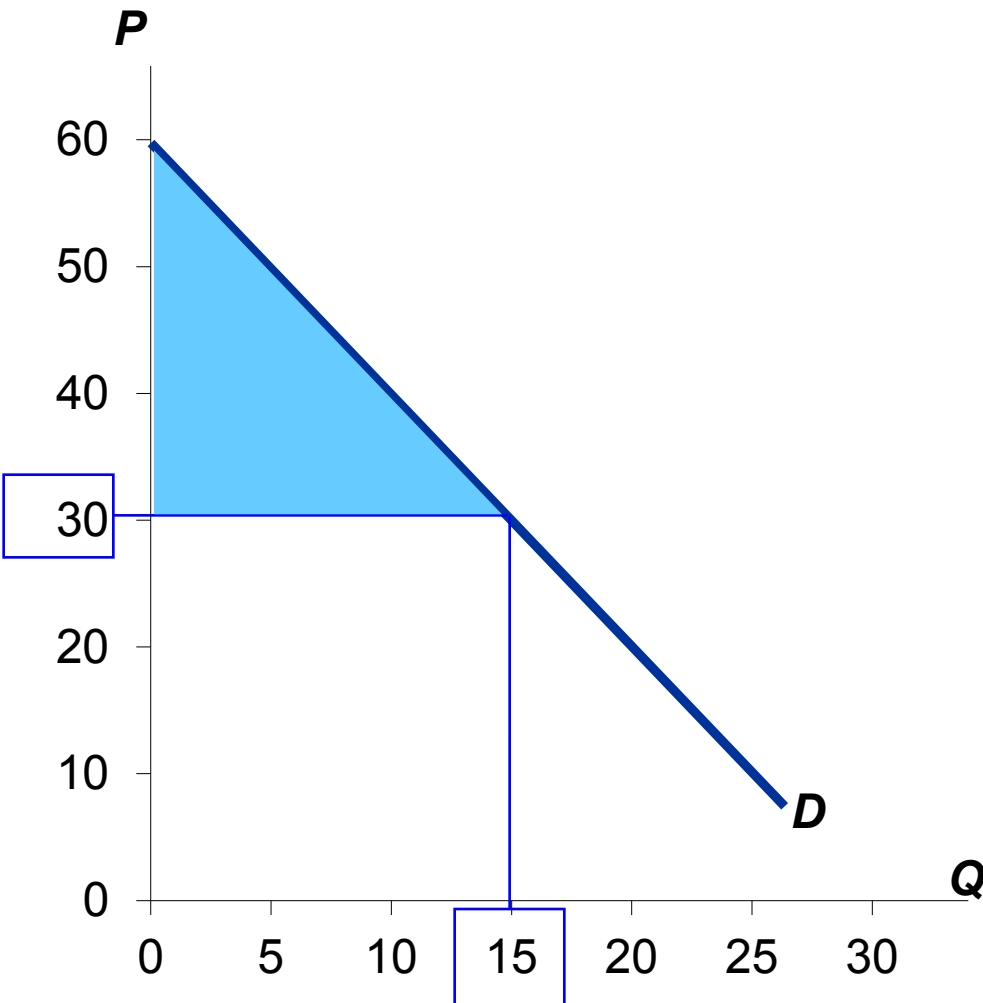
- Nadech's CS = \$50
- James' CS = \$0
- Ken's CS = \$100
- Boy's CS = \$0
- Total CS = \$150

Consumer Surplus and WTP

Total CS equals the area under the demand curve above the price, from 0 to Q .

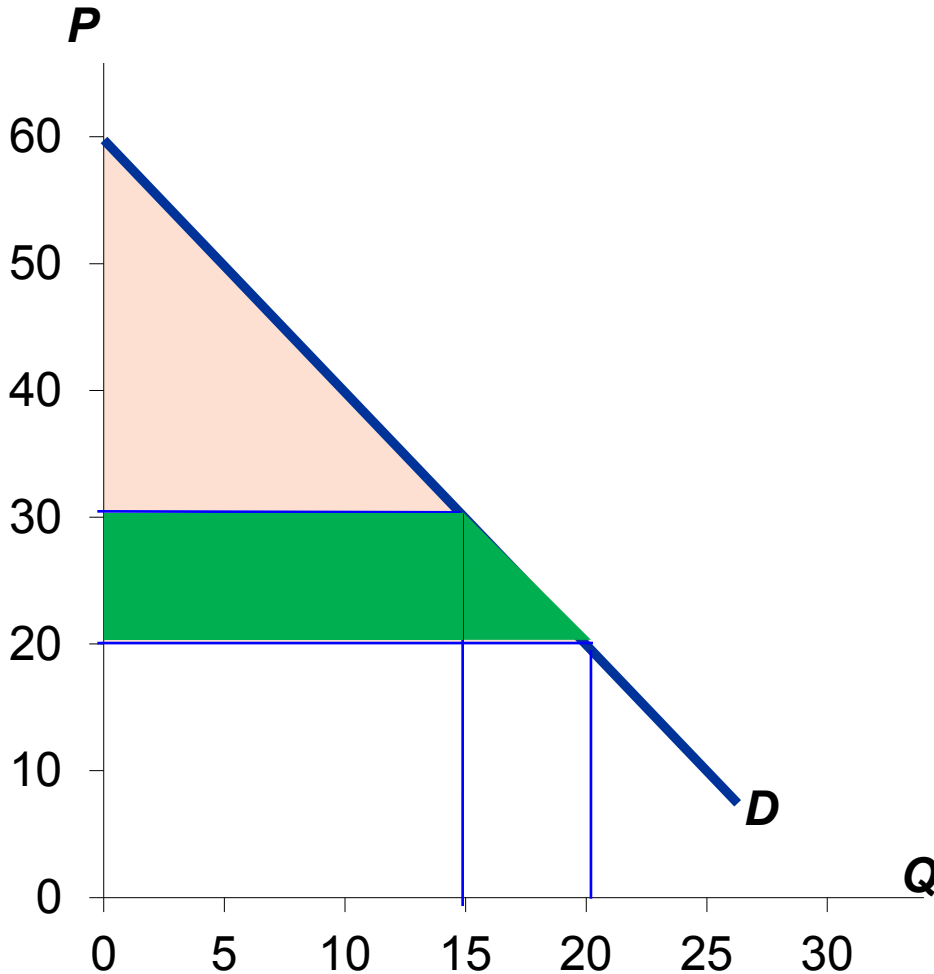


Consumer Surplus: Many Buyers and Smooth Demand Curve



- Consumer surplus is the area under the demand curve above the price line.
- Suppose $P = \$30$.
- $CS = \frac{1}{2} * 15 * 30 = \225

Consumer Surplus When Price is lower.



- When the price is lower, the CS will be higher.
- Suppose price decreases from 30 to 20.
 - New CS = $\frac{1}{2} * 20 * 40 = 400$
 - $\Delta CS = 400 - 225 = 175$

Cost and the Supply Curve

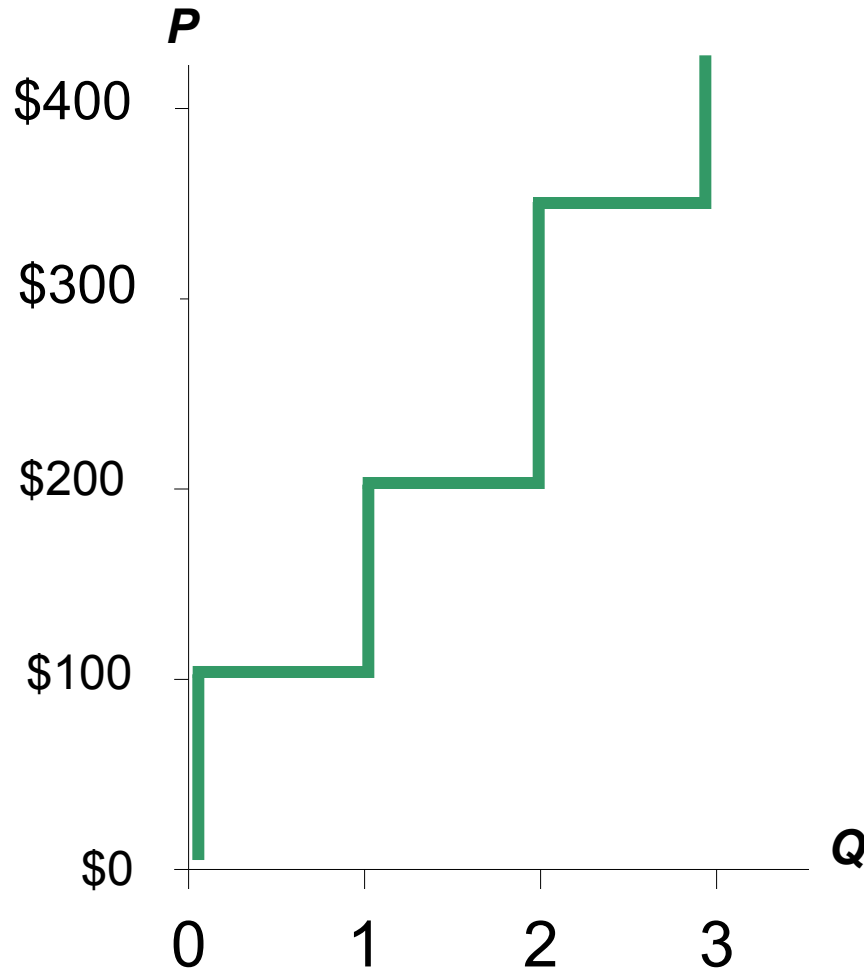
- **Cost** is the value of everything a seller must give up to produce a good (*i.e.*, opportunity cost).
- It includes cost of all resources used to produce good, including value of the seller's time.
- Example: Costs of 3 sellers of iPhones.

Seller	cost
I-store1	\$100
I-store2	200
I-store3	350

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

Hence, **cost is a measure of willingness to sell.**

Cost and the Supply Curve



P	Q^s
\$0 – 99	0
100 – 199	1
200 – 349	2
350 & up	3

- At each Q , the height of the S curve is the cost of the *marginal seller*.

Producer Surplus

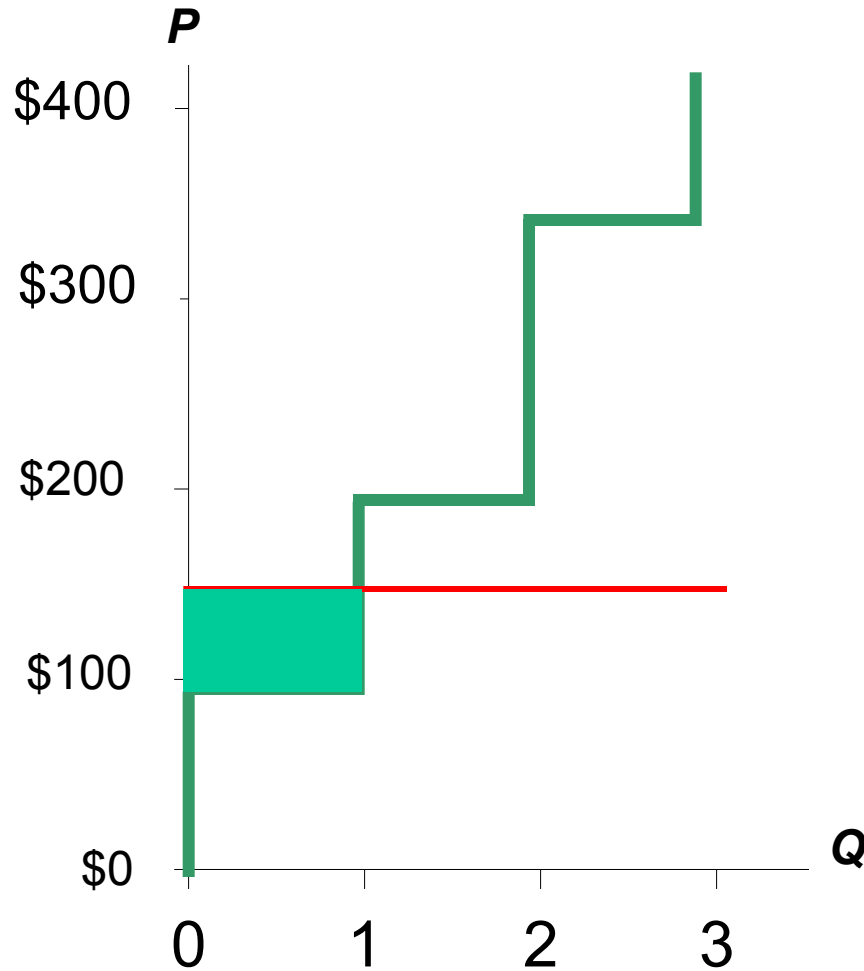
- **Producer surplus (PS)** is the difference between what a seller is willing to sell (i.e. cost) and the price at which s/he actually sells.
- Mathematically, $PS = P - \text{Cost}$.
- Example:

Seller	cost
I-store1	\$100
I-store2	200
I-store3	350

Suppose $P = \$150$.

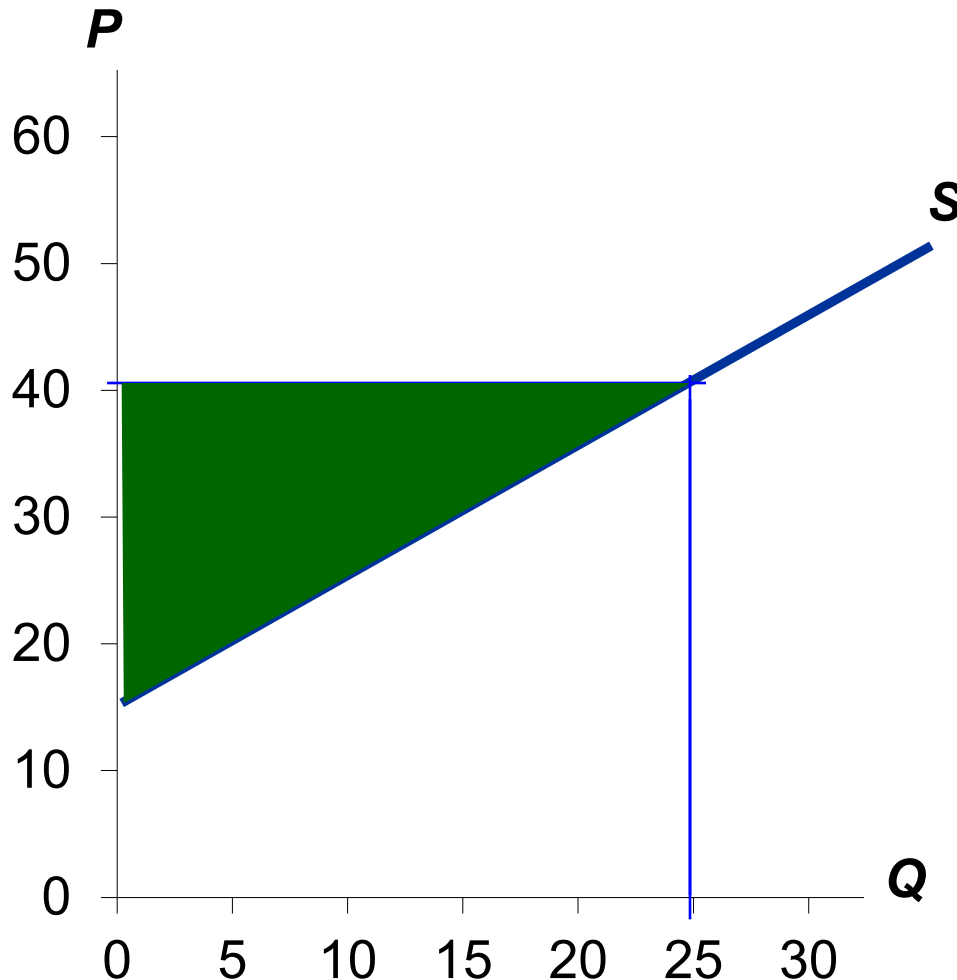
➤ Total PS = \$50

Producer Surplus and the Supply Curve



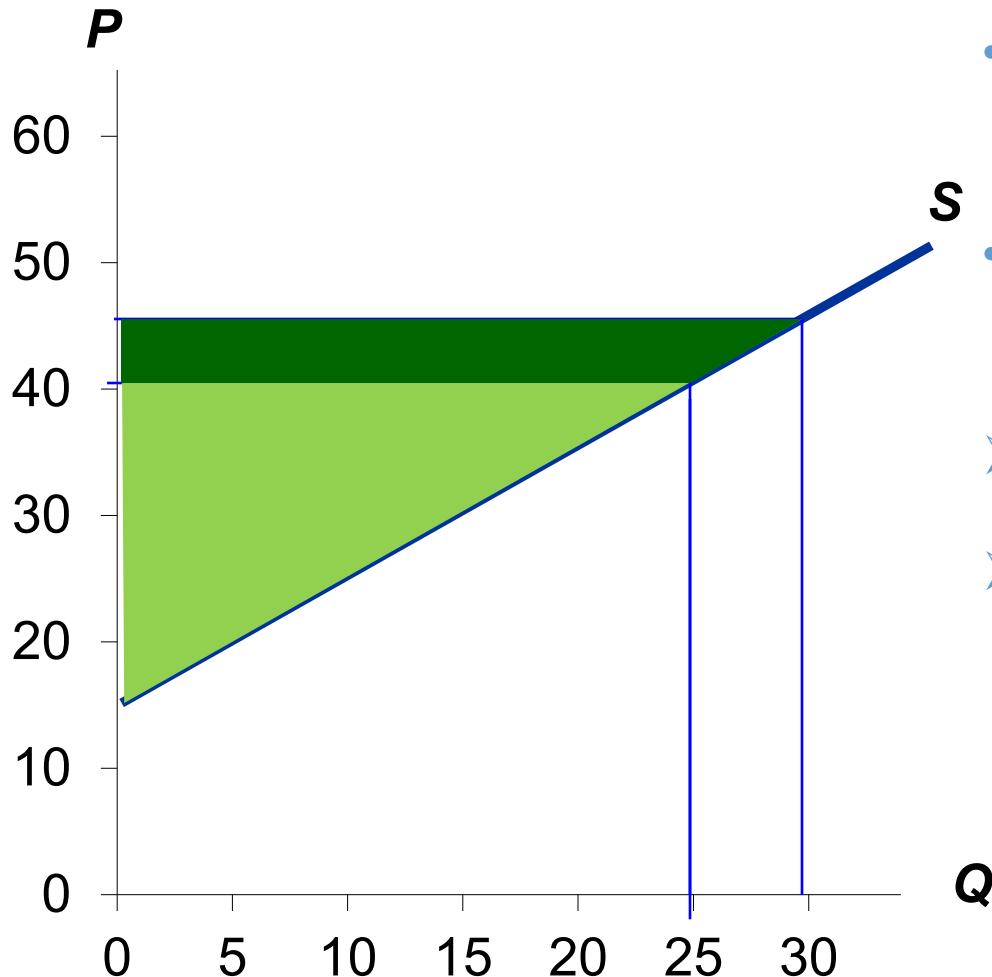
Total PS equals the area above the supply curve under the price, from 0 to Q .

Producer Surplus: Many Sellers and Smooth Supply Curve



- Producer surplus is the area above the supply curve and under the price line.
- Suppose $P = \$40$.
- $PS = \frac{1}{2} * 25 * (40-15)$
 $= \$312.5$

Producer Surplus When Price is Higher



- When the price is higher, the PS will be higher.

- Suppose price increases from 40 to 45.

➤ New PS = $\frac{1}{2} \times 30 \times 30 = \450

➤ $\Delta PS = \$137.5$

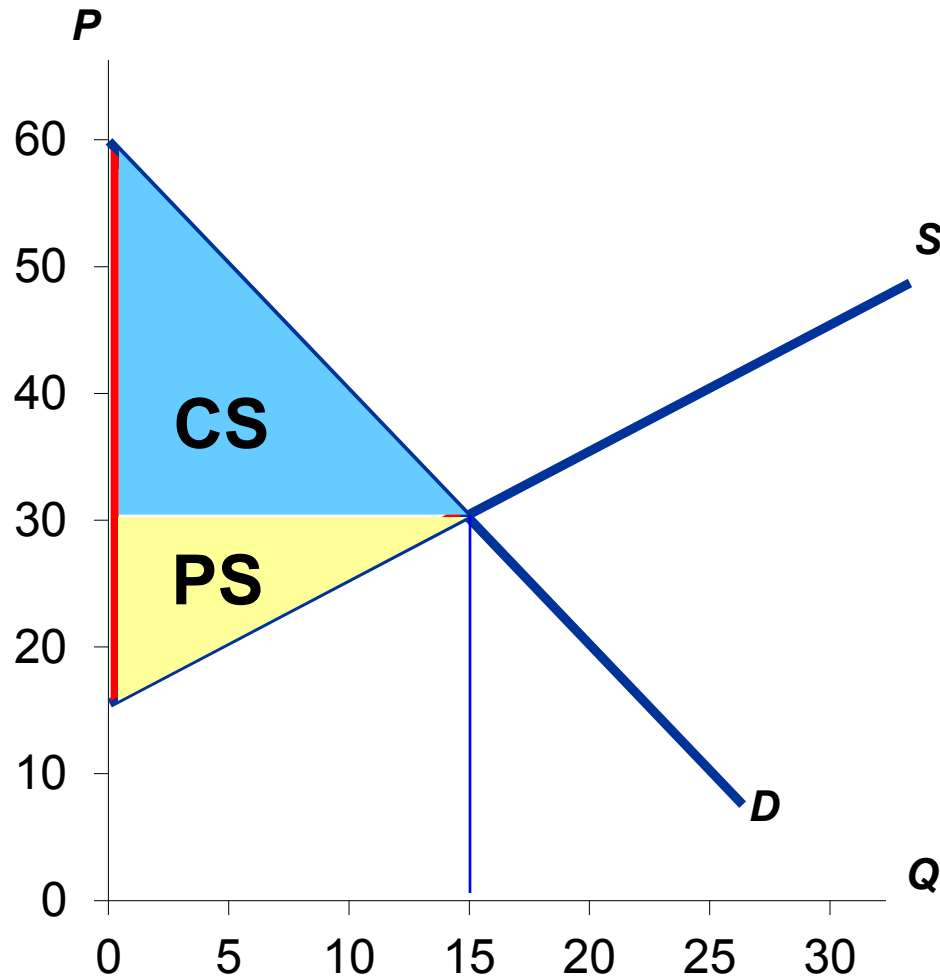
Total Surplus (a.k.a. Social Welfare)

- $CS = (\text{value to buyers}) - (\text{amount paid by buyers})$
 - CS measures the benefit buyers receive from participating in the market.
- $PS = (\text{amount received by sellers}) - (\text{cost to sellers})$
 - PS measures the benefit sellers receive from participating in the market.
- $\text{Total surplus} = CS + PS$
 - TS measures the total gains from trade in a market.
 - We use total surplus as a measure of society's well-being.

Efficiency

- Total Surplus = CS + PS
- Total Surplus = (value to buyers) – (cost to sellers)
- An allocation of resources is **efficient** if it maximizes total surplus. Efficiency means:
 - Raising or lowering the quantity of a good would not increase total surplus.
 - The goods are being produced by the producers with lowest cost.
 - The goods are being consumed by the buyers who value them most highly.

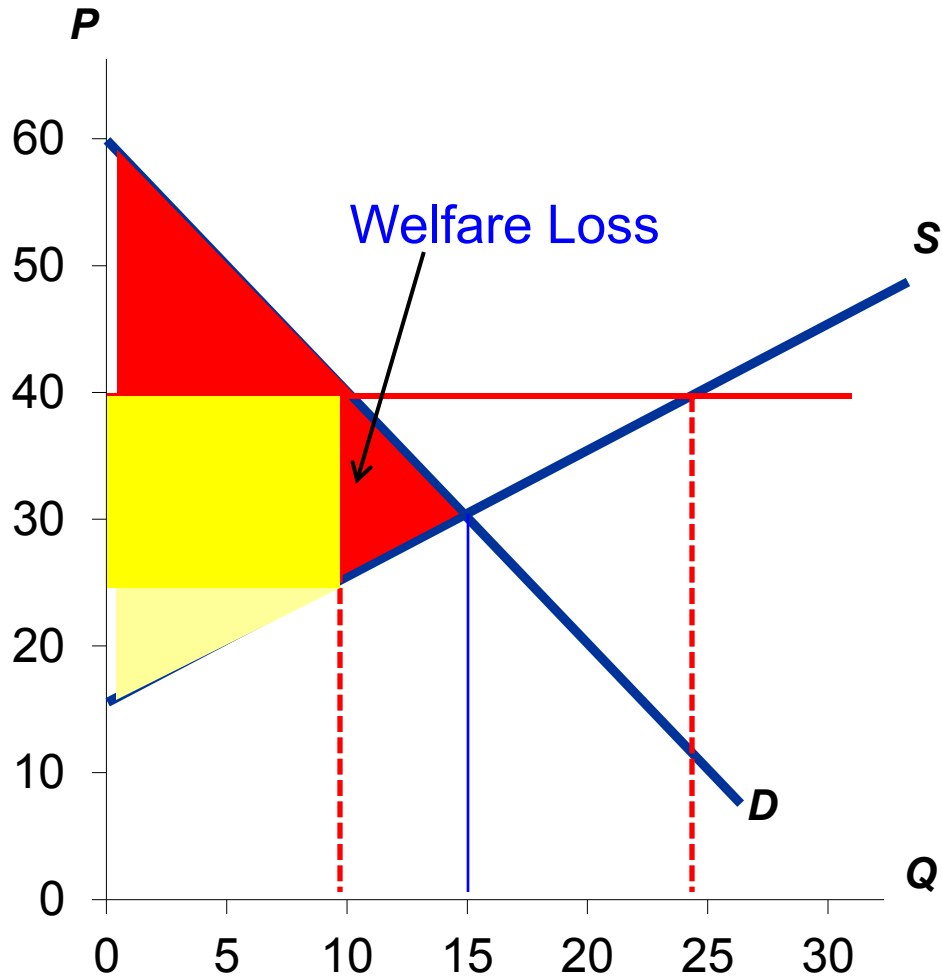
Market Equilibrium



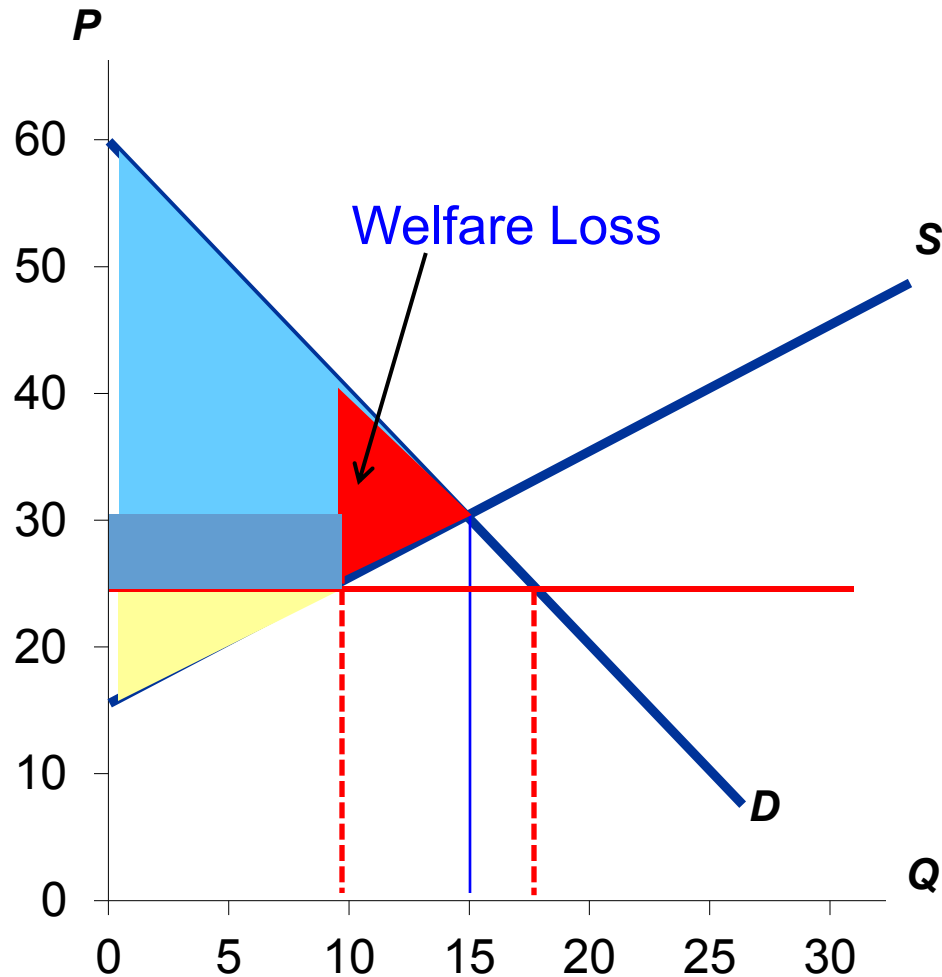
- The equilibrium quantity maximizes total surplus.
- Why?
 - Because there is neither excess demand nor excess supply.
 - The value of the last unit consumed by the consumer equals to the cost of producing the last unit.
 - No welfare loss!

Market Equilibrium:

Welfare Loss When $P > P_E$



Market Equilibrium: Welfare Loss When $P < P_E$



Applications (Next Topics)

- Price floors
- Price ceilings
- Tax/subsidy