

EE211

PRINCIPLES OF MICROECONOMICS

Topic 4:

Consumer Surplus, Producer Surplus, 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	\$350
James	300
Mario	250
Ken	200

Suppose the price of an iPhone is \$250.

Q: Who will buy an iPhone?



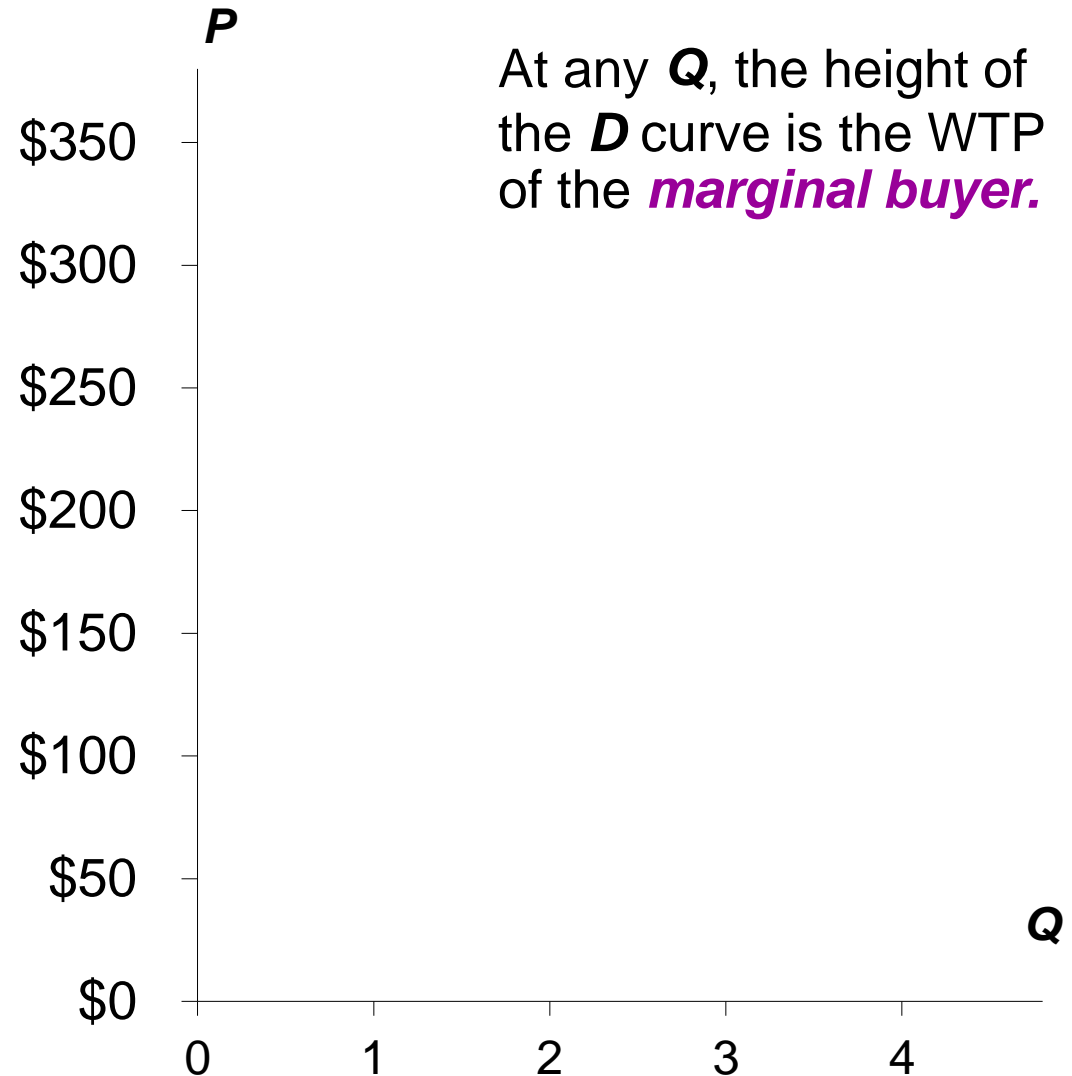
Q: What is quantity demanded?



Deriving the Demand Curve

Consumer	WTP
Nadech	\$350
James	300
Mario	250
Ken	200

P	Q^d
\$351+	
301 – 350	
251 – 300	
201 – 250	
0 – 200	



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:

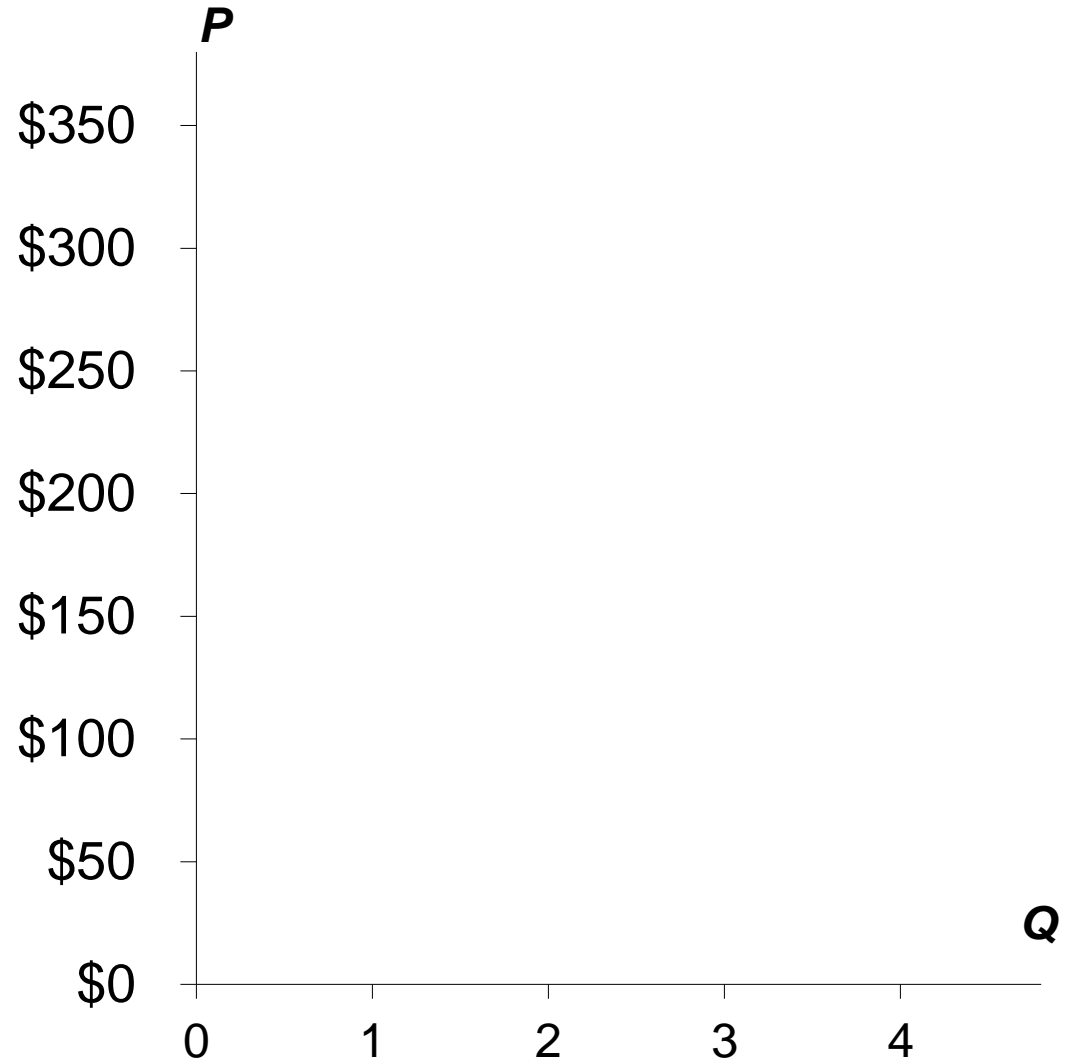
Consumer	WTP
Nadech	\$350
James	300
Mario	250
Ken	200

Suppose $P = \$200$.

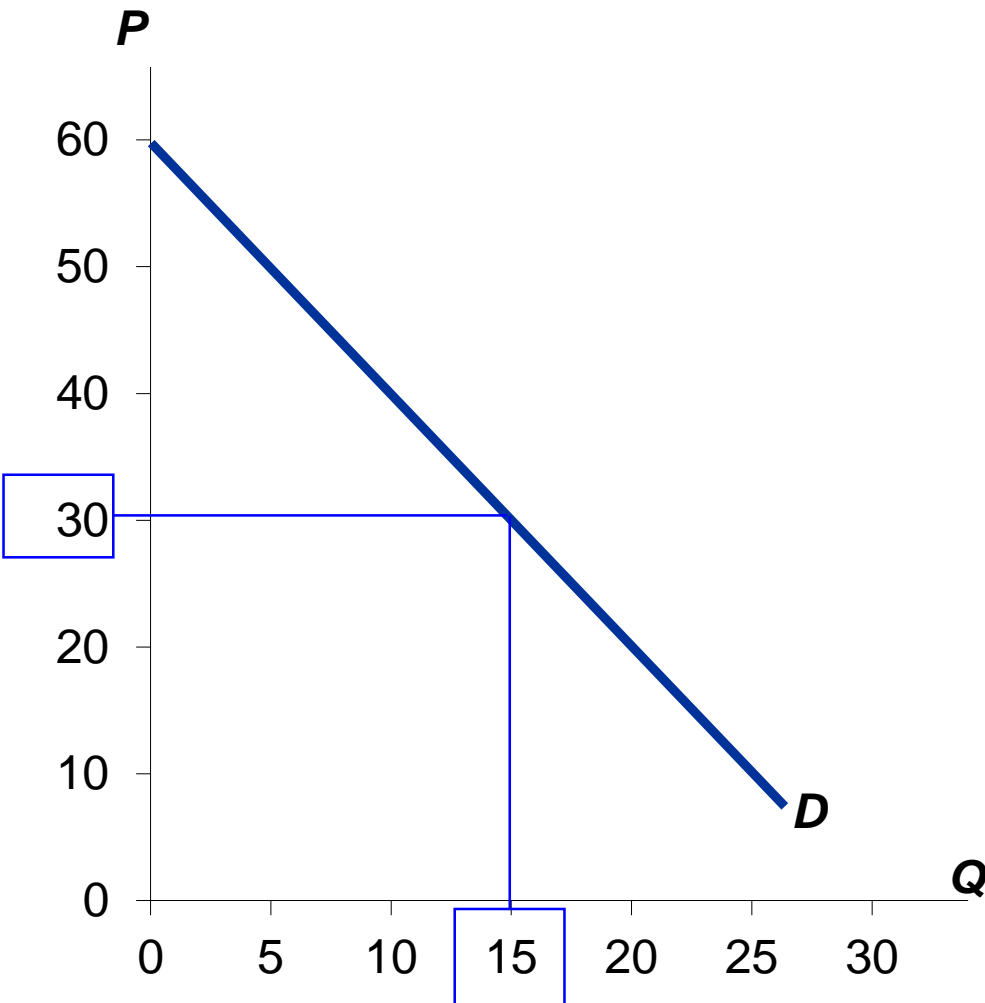
- Nadech's CS =
- James' CS =
- Mario's CS =
- Ken's CS =
- Total CS =

Consumer Surplus and WTP

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

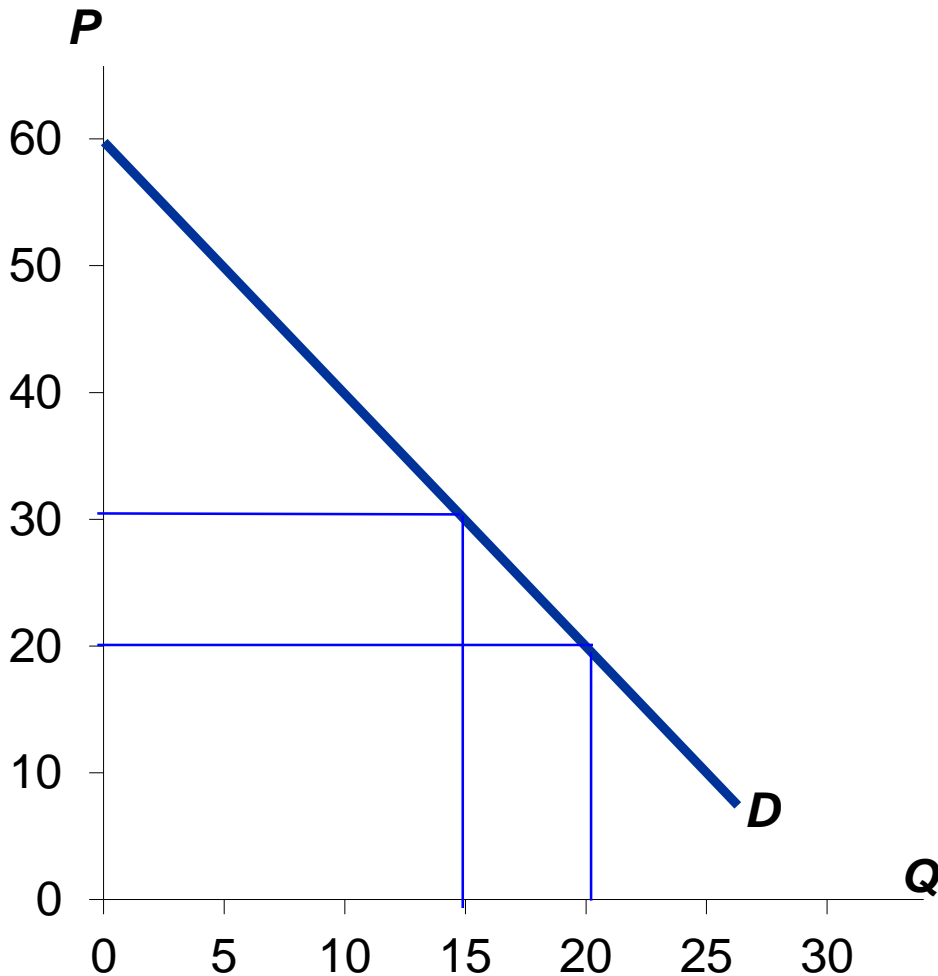


Consumer Surplus: Many Buyers and Smooth Demand Curve



- Consumer surplus is the area under the demand curve above the price line.
- Suppose $P = 30$.
- $CS =$

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 =
 - $\Delta CS =$

Cost and the Supply Curve

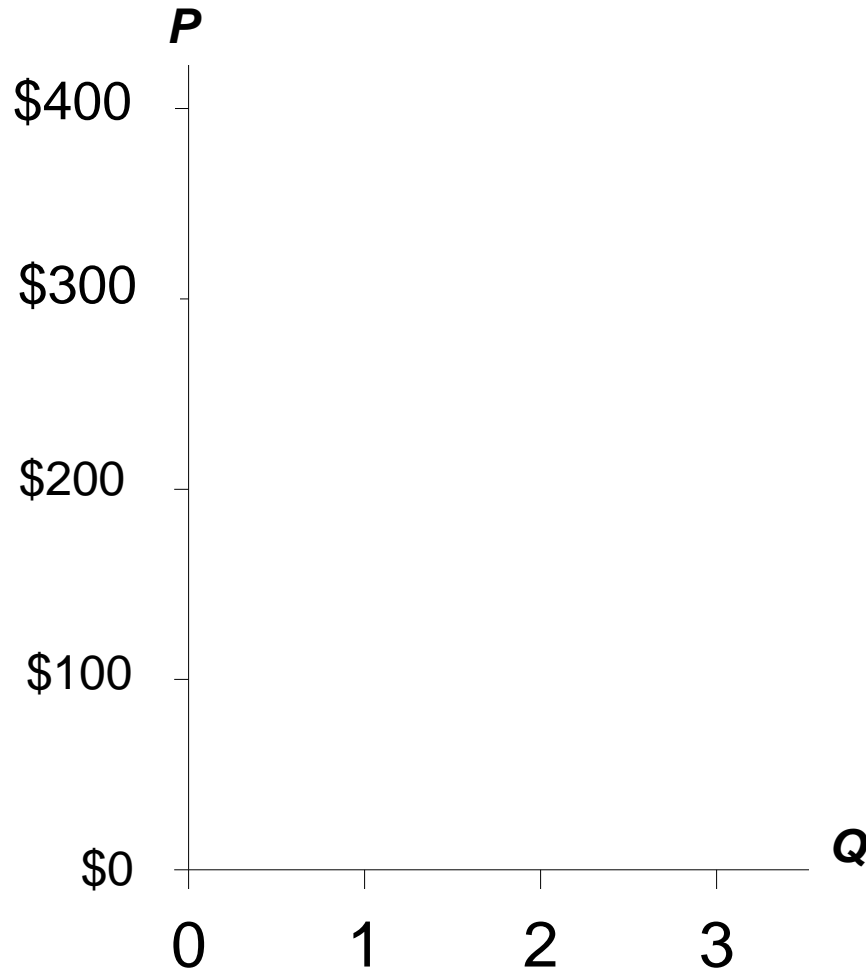
- **Cost** is the value of everything a seller must give up to produce a good (*i.e.*, opportunity cost).
- It includes cost of all resources used to produce good, including value of the seller's time.
- Example: Costs of 4 sellers of iPhones.

Seller	cost
I-store1	\$200
I-store2	250
I-store3	300
I-store4	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 – 199	
200 – 249	
250 – 300	
301+	

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

Producer Surplus

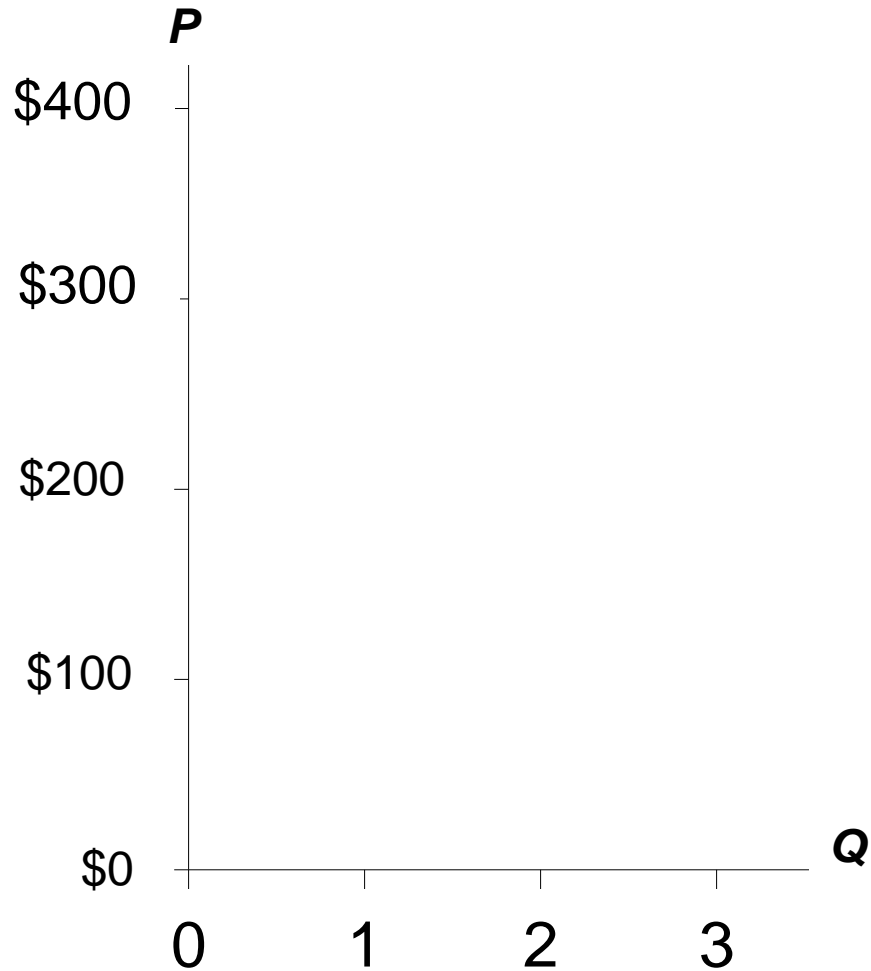
- **Producer surplus (PS)** is the difference between what a seller is willing to sell (i.e. cost) and the price at which s/he actually sells.
- Mathematically, $PS = P - Cost$.
- Example:

Seller	cost
I-store1	\$200
I-store2	250
I-store3	300
I-store4	350

Suppose $P = \$250$.

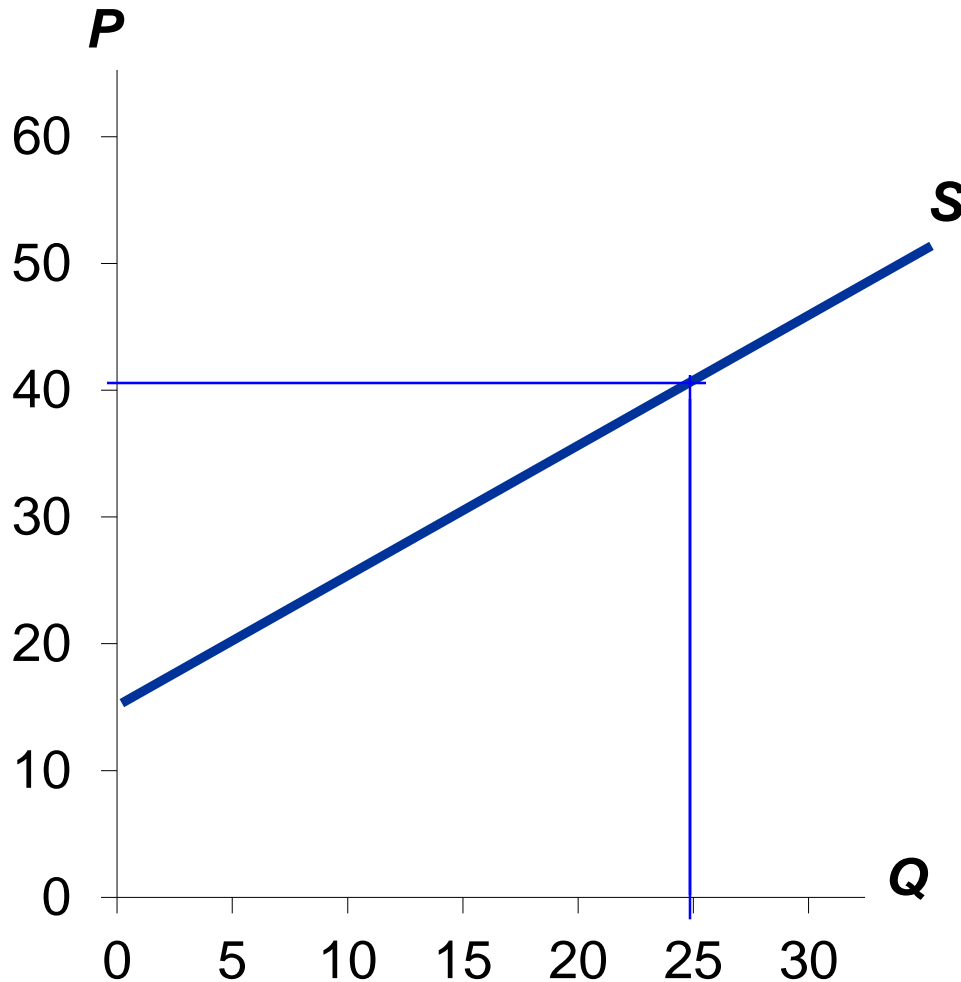
➤ Total PS =

Producer Surplus and the Supply Curve



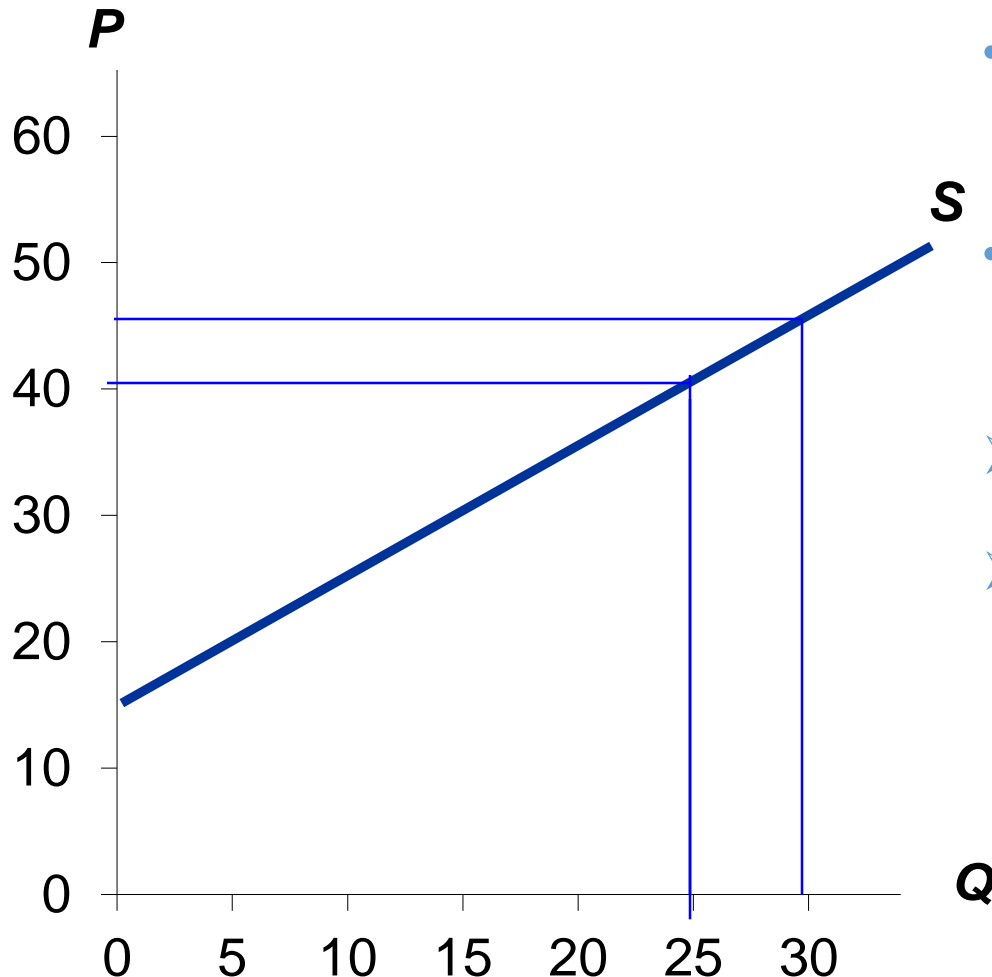
Total PS equals the area above the supply curve under the price, from 0 to Q .

Producer Surplus: Many Sellers and Smooth Supply Curve



- Producer surplus is the area above the supply curve and under the price line.
- Suppose $P = 40$.
- $PS =$

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 =

➤ $\Delta PS =$

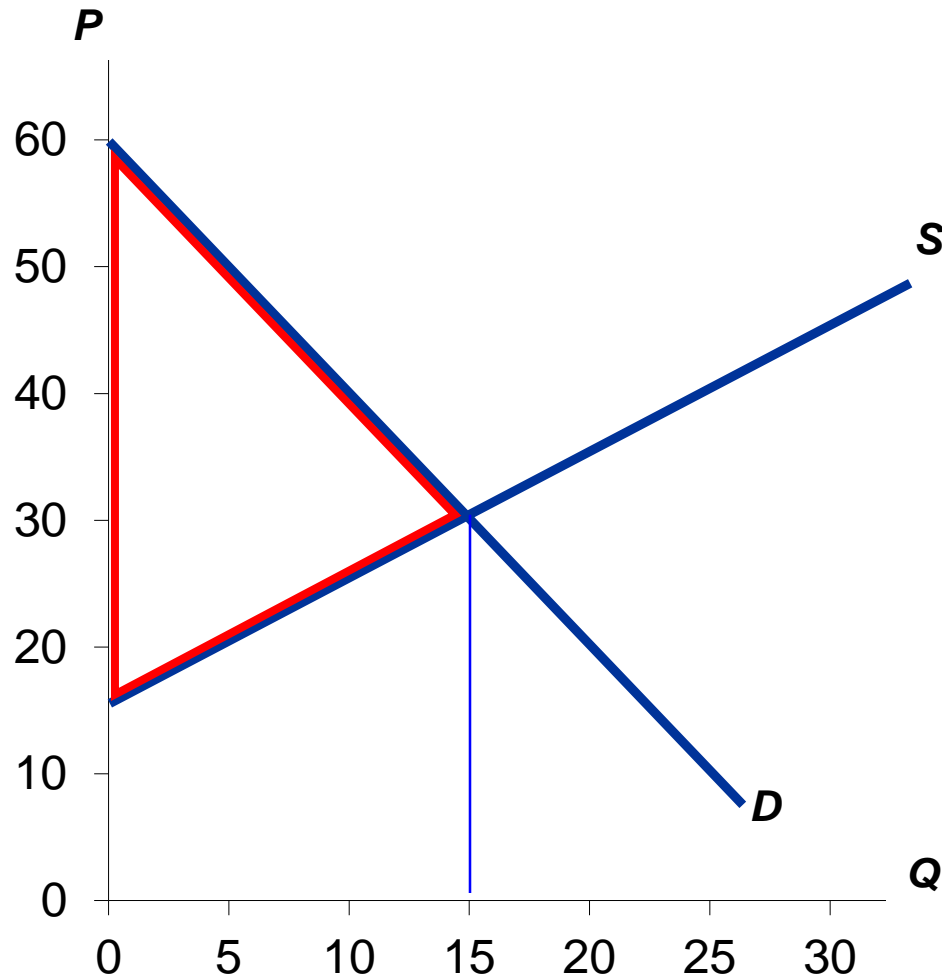
Total Surplus (a.k.a. Social Welfare)

- $CS = (\text{value to buyers}) - (\text{amount paid by buyers})$
 - 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.

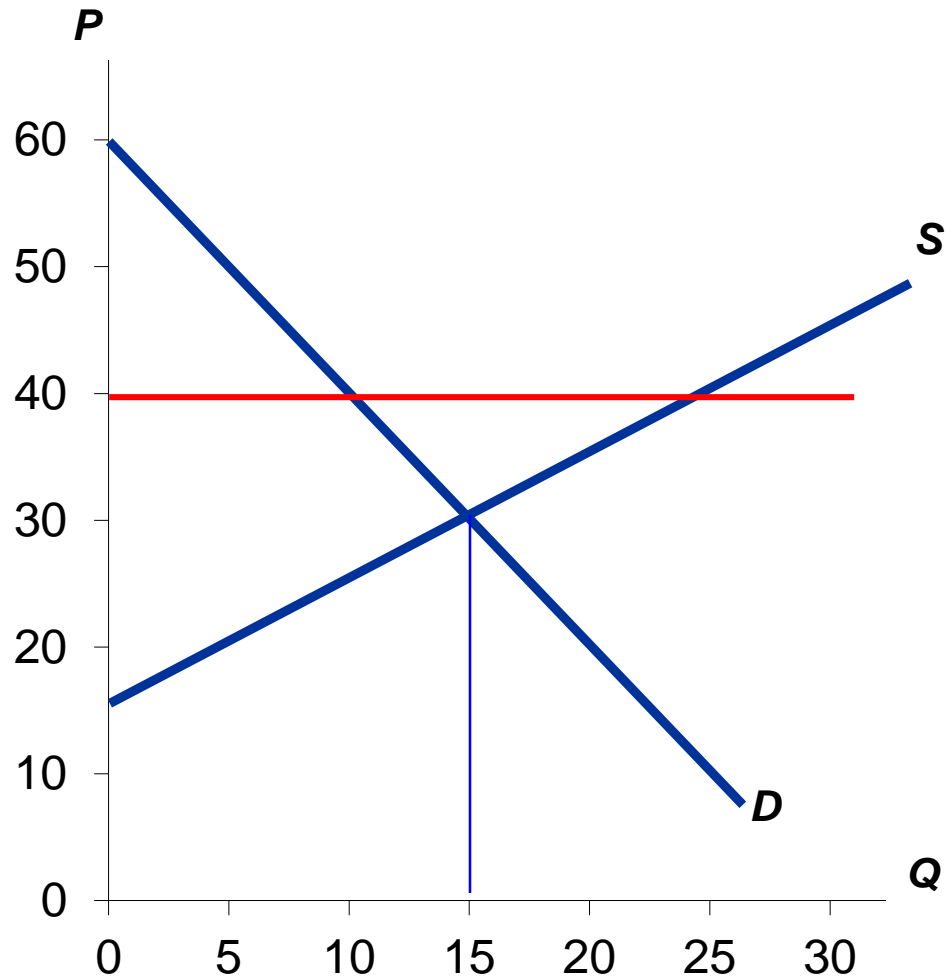
Market Equilibrium



- The equilibrium quantity maximizes total surplus.
- Why?



Market Equilibrium: Welfare Loss When $P > P_E$



Market Equilibrium: Welfare Loss When $P < P_E$

