Principles of Economics

Welfare Analysis

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This version: Fall 2017

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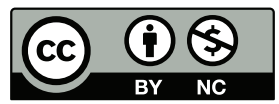


Welfare Economics

- Recall, the **allocation of resources** refers to:
  - how much of each good is produced
  - which producers produce it
  - which consumers consume it
- **Welfare Economics** studies *how* the allocation of resources affects economic well-being.

Willingness to Pay

- A buyer's **willingness to pay** (**WTP**) for a good is the maximum amount the buyer will pay for that good.
- WTP measures how much the buyer **values** the good.

Willingness to Pay

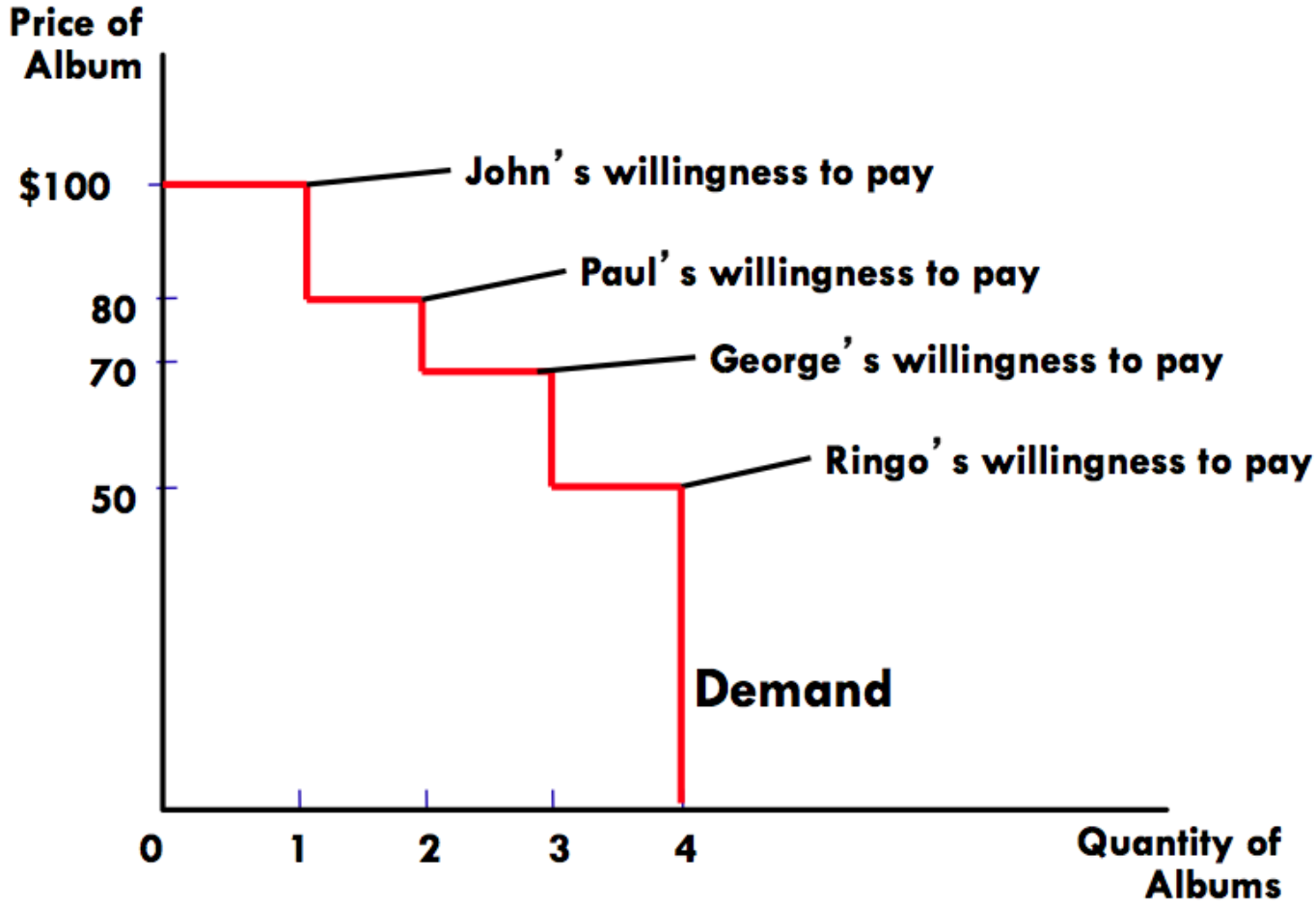
- **Q:** If price of the good is $75, who will buy, and what is quantity demanded?

Buyer	Willingness to Pay
John	$100
Paul	80
George	70
Ringo	50

WTP and Demand Curve

Price	Buyer	Quantity Demanded
More than $100	None	0
$80 to $100	John	1
$70 to $80	John, Paul	2
$50 to $70	John, Paul, George	3
$50 or less	Ringo	4

WTP and Demand Curve



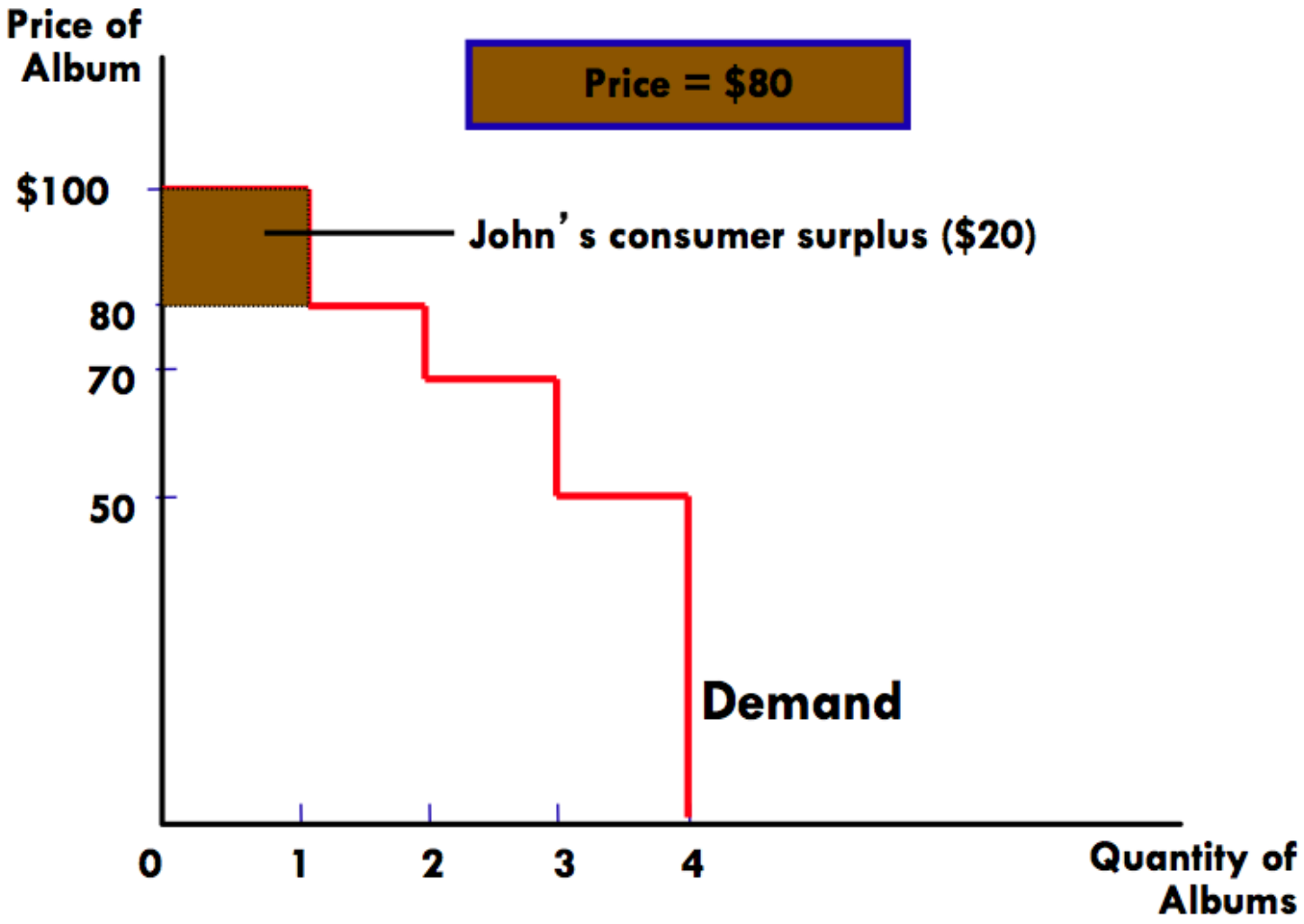
At any Q, the height of the demand curve is the WTP of the **marginal buyer** – the buyer who would leave the market if P were any higher.

Consumer Surplus

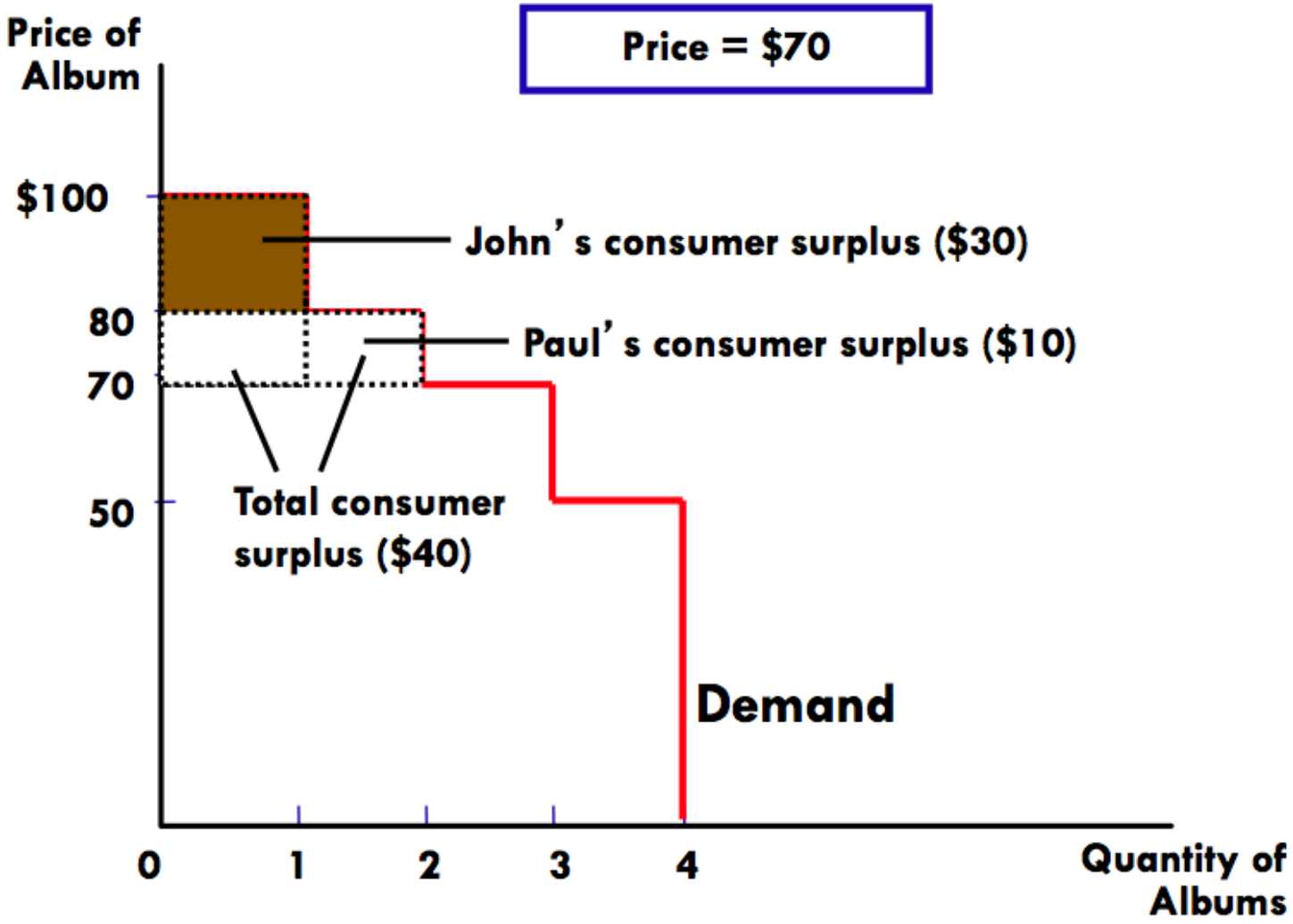
- **Consumer surplus** (**CS**) is the amount a buyer is willing to pay for a good minus the amount the buyer actually pays for it.

$$CS \equiv WTP - P$$

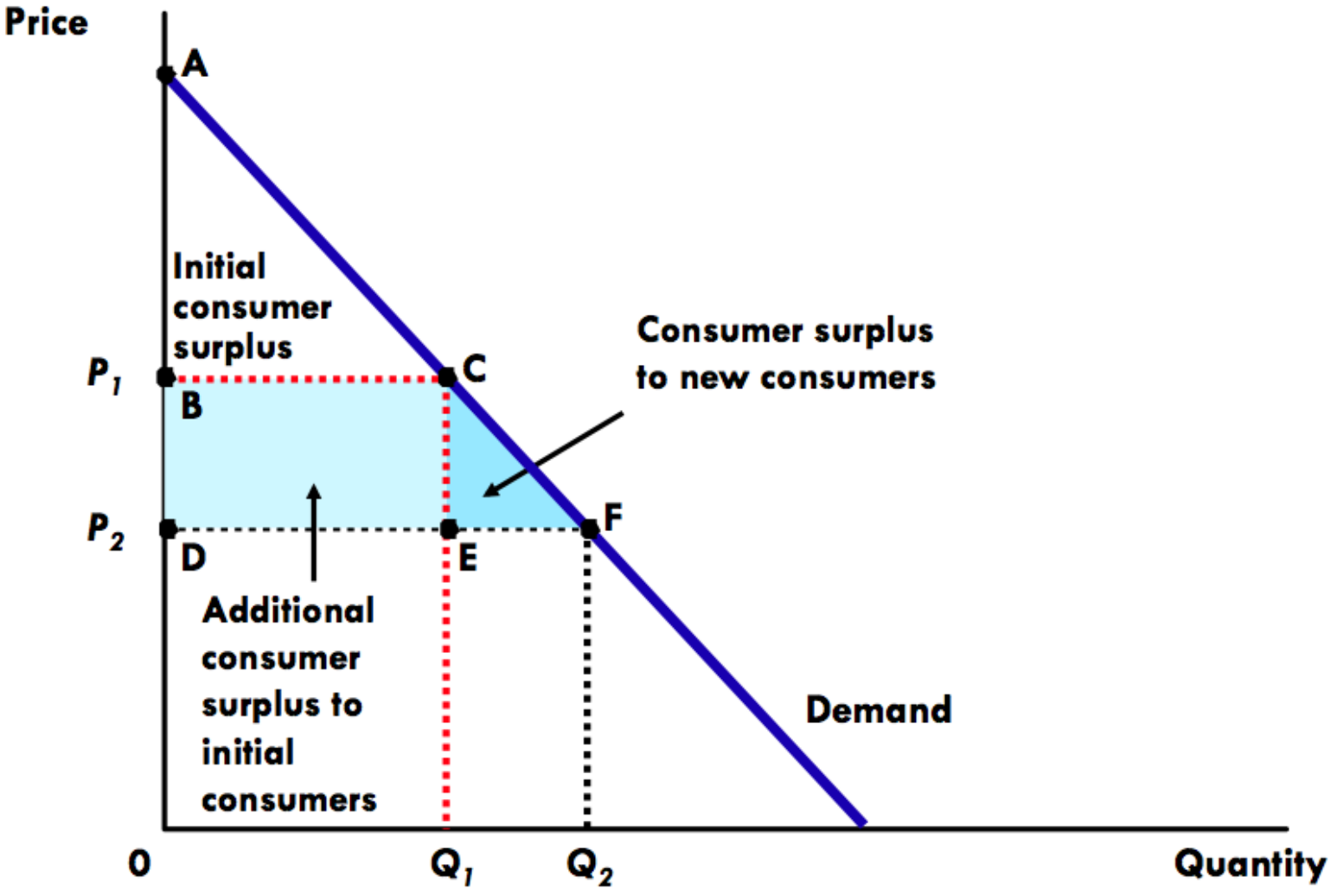
CS and Demand Curve



CS and Demand Curve



How Price Affects CS



Consumer Surplus

- Cconsumer surplus measures the benefit that buyers receive from a good **as the buyers themselves perceive it**.
- CS is a good measure of economic well-being *if we respect the preferences of buyers*.
- Economists normally assume:
  - Buyers are rational when they make decisions.
  - People's preferences should be respected and consumers are the best judges of how much benefit they receive from the goods they buy.
  - What about the preferences of drug addicts? Do addicts get a large benefit from being able to buy heroin at a low price?

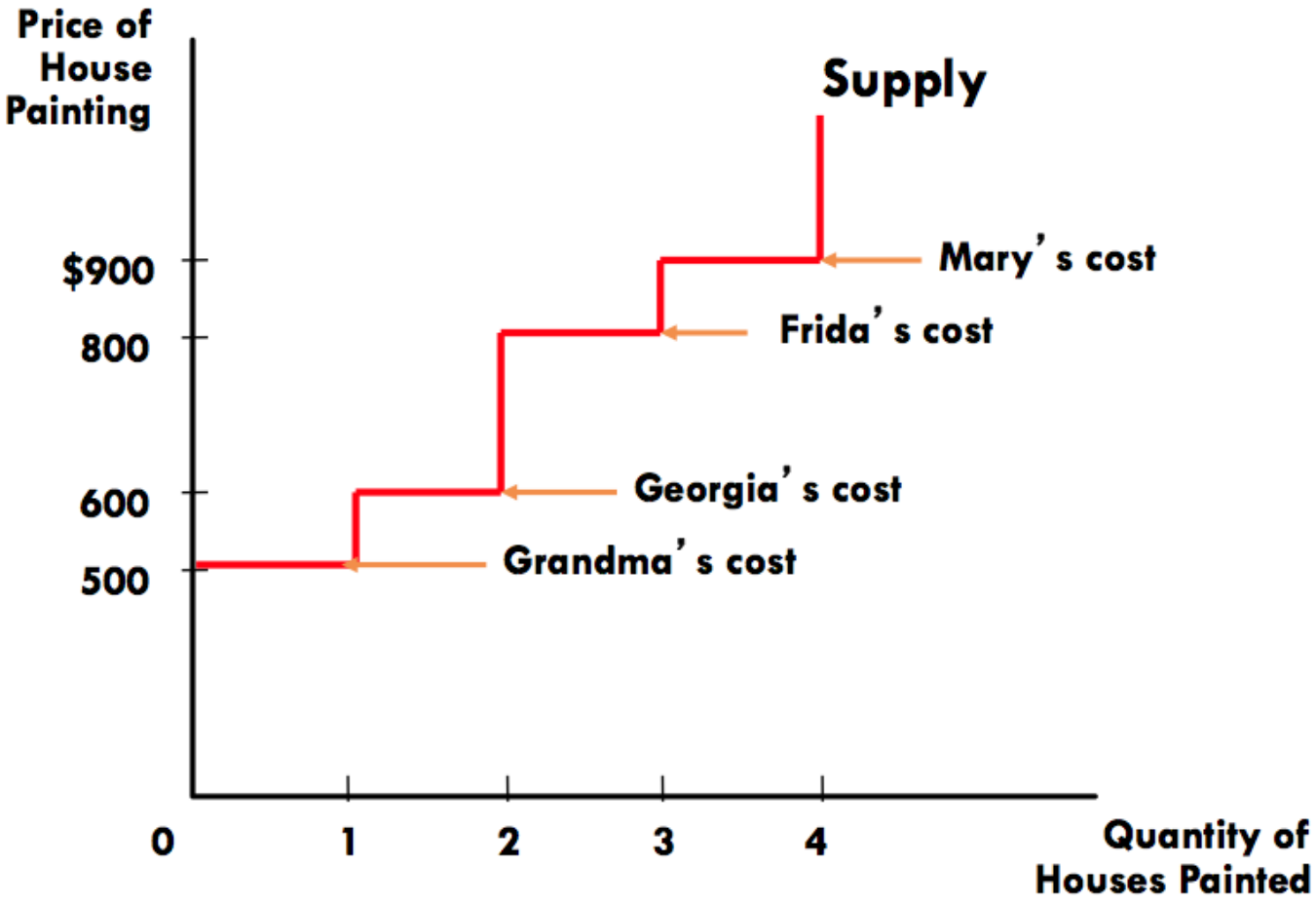
Cost

- Cost is the value of everything a seller must give up to produce a good (i.e., opportunity cost).
- A seller will produce and sell the good/service only if the price exceeds his or her cost.

Seller	Cost
Mary	$900
Frida	800
Georgia	600
Grandma	500

Price	Sellers	Quantity Supplied
$900 or more	Mary, Frida, Georgia, Grandma	4
$800 to $900	Frida, Georgia, Grandma	3
$600 to $800	Georgia, Grandma	2
$500 to $600	Grandma	1
Less than $500	None	0

Cost and Supply Curve



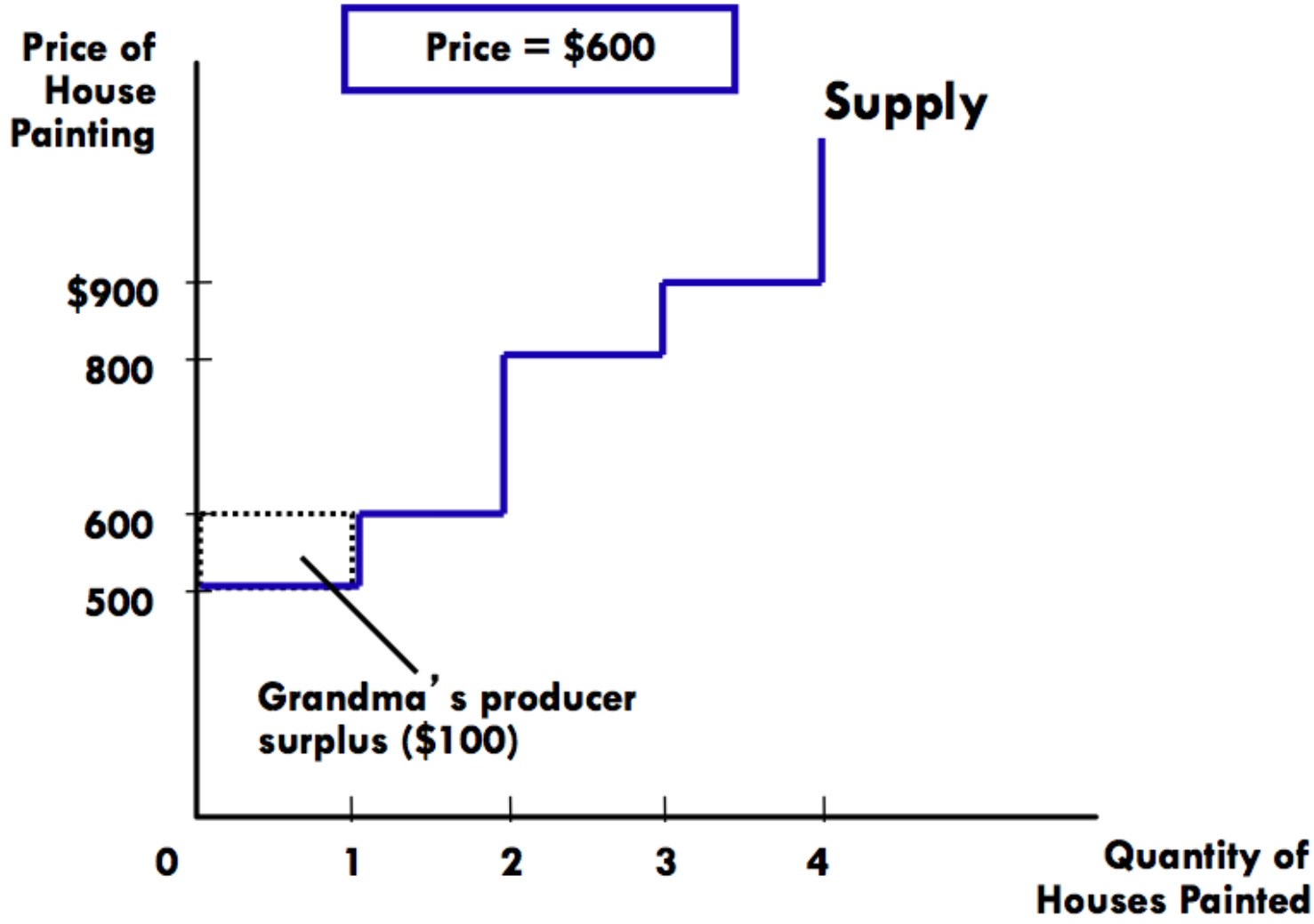
At any Q, the height of the S curve is the cost of the **marginal seller** – the seller who would leave the market if P were any lower

Producer Surplus

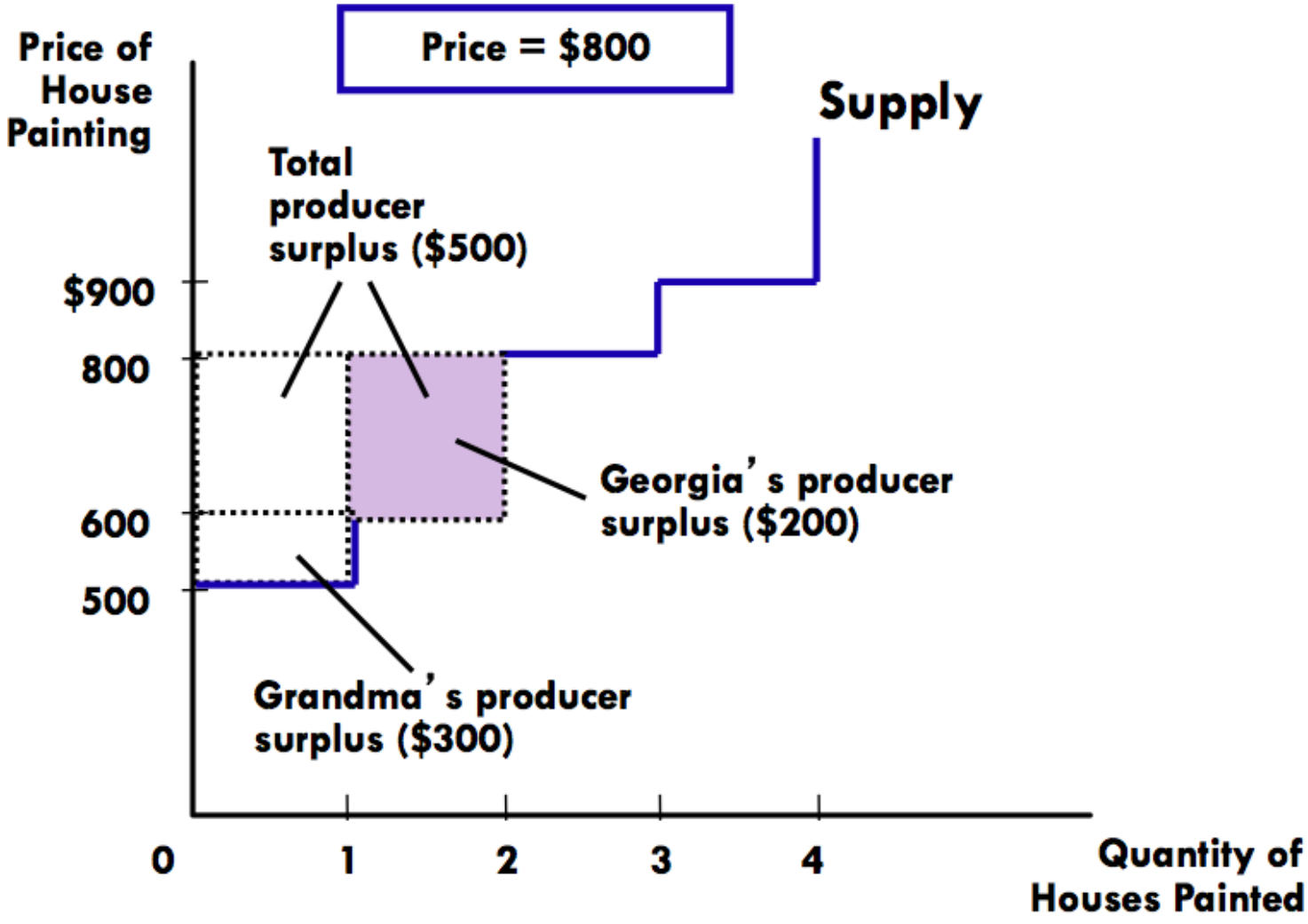
- **Producer surplus** (**PS**) is the amount a seller is paid minus the cost of production.

$$PS \equiv P - C$$

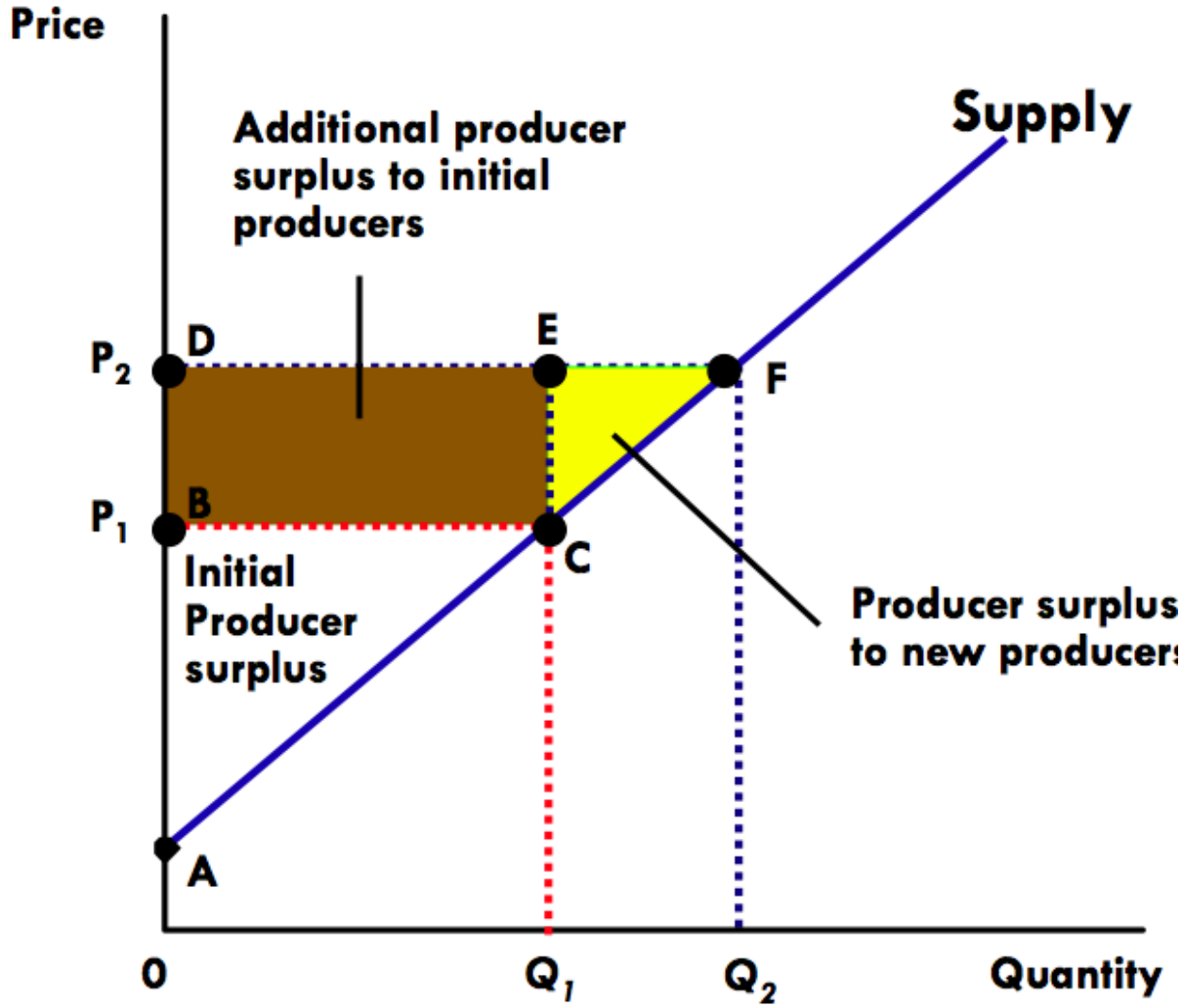
Producer Surplus



Producer Surplus

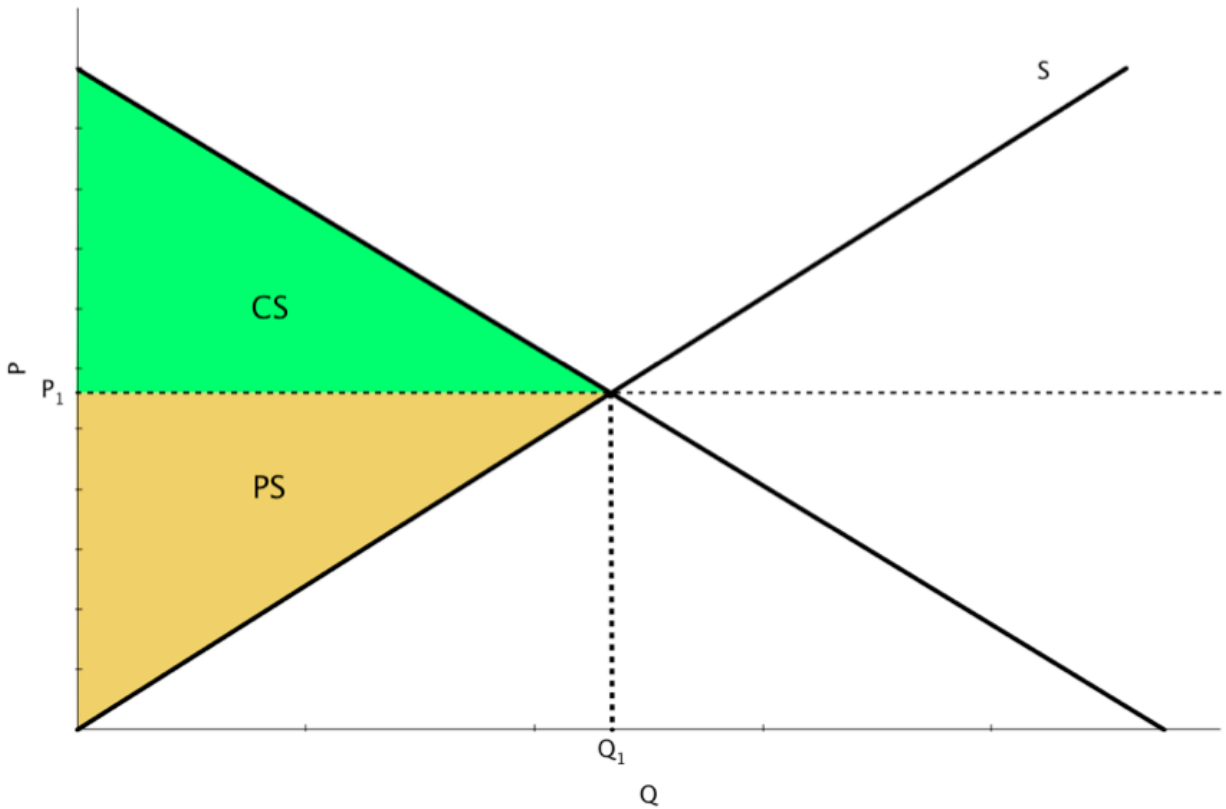


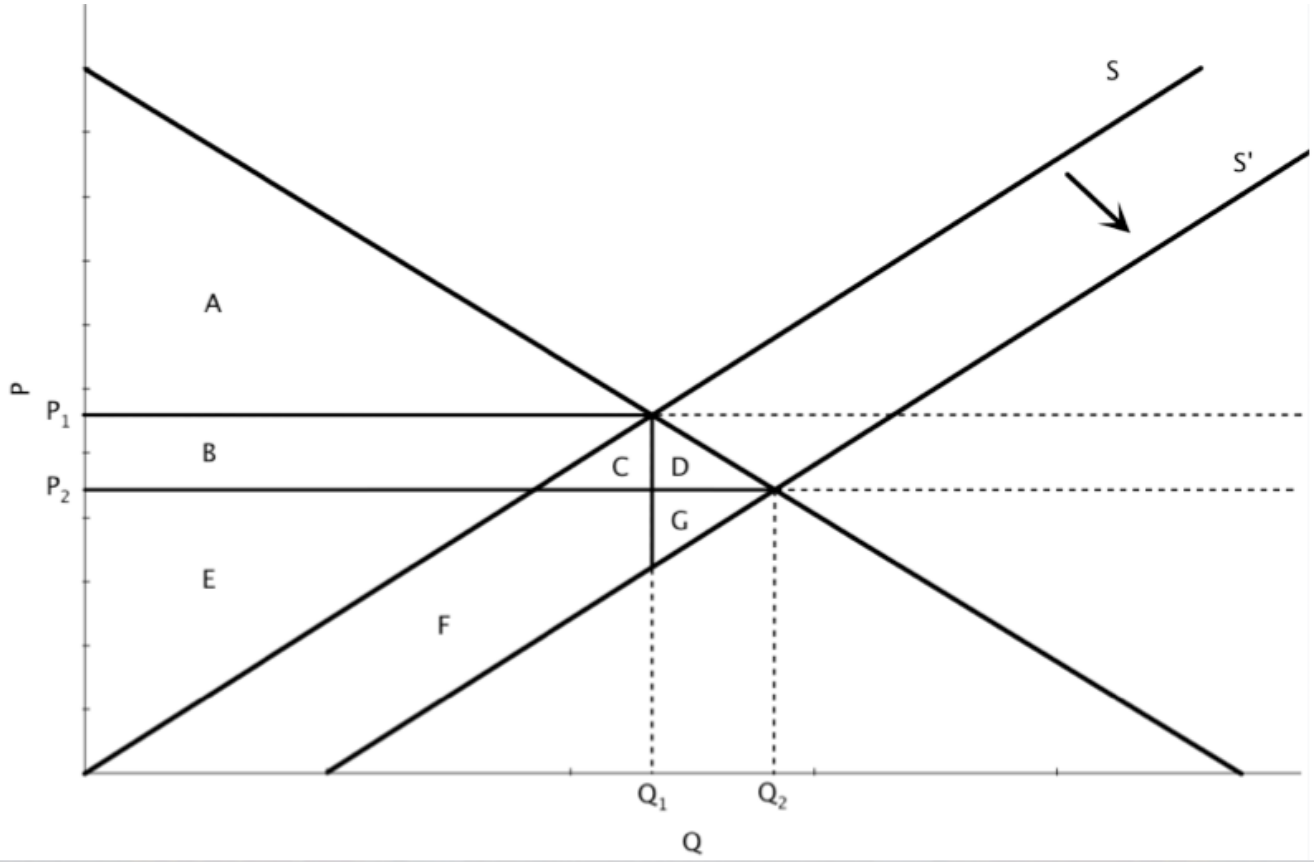
How Price Affects PS



Consumer Surplus and Producer Surplus

- Consider the market for good A. If the costs of inputs for A fall, how would the market equilibrium change and how would CS and PS change?





	Before	After	Difference
CS	A	A+B+C+D	B+C+D
PS	B+E	E+F+G	F+G-B
TS	A+B+E	A+B+C+D+E+F+G	C+D+F+G

Consumer Surplus and Producer Surplus

- CS and PS are the basic tools to study and evaluate welfare of buyers and sellers
- **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
- **Total Surplus** = CS + PS = total gains from trade in the market = value to buyers - cost to sellers.

Market Efficiency

- 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 desirable? Would a different allocation make society better off?
- To answer the question, we need a measure of society's well-being.

Market Efficiency

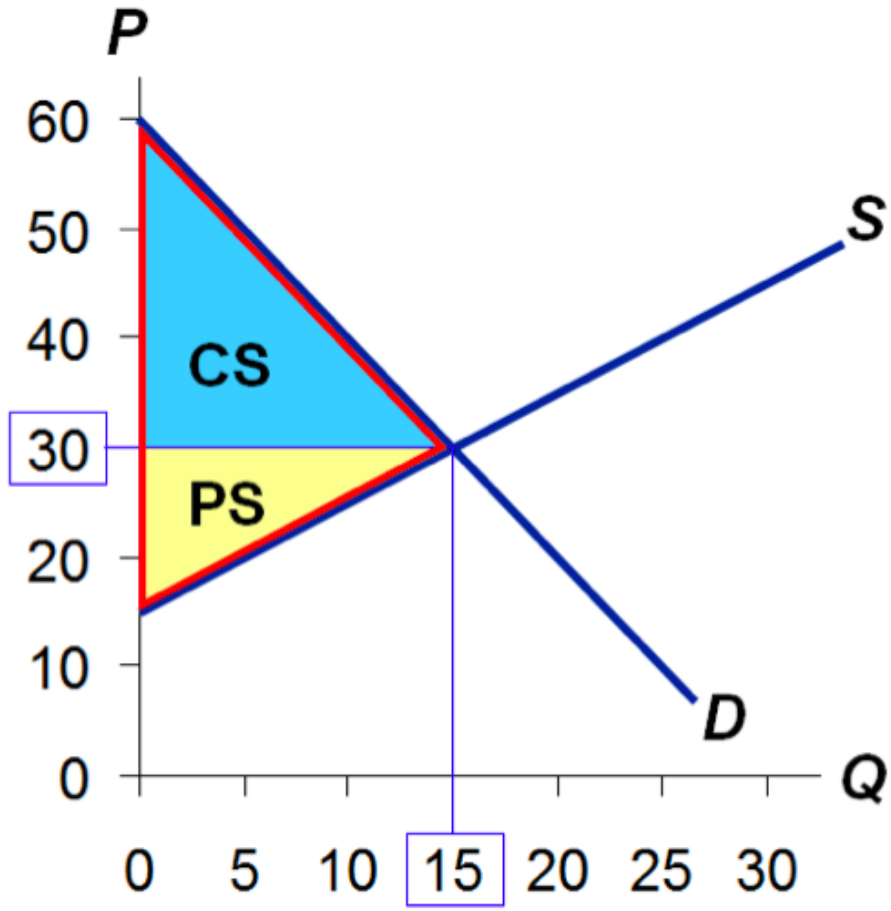
- **Market efficiency**: an allocation of resources is *efficient* if it maximizes total surplus.
  - Recall the difference between efficiency and equality: an allocation in which the total surplus is maximized but is captured by one person is efficient, but certainly not equal.

Evaluating the Market Equilibrium

Market eq'm:
P = $30
Q = 15,000

Total surplus
= CS + PS

Is the market eq'm efficient?

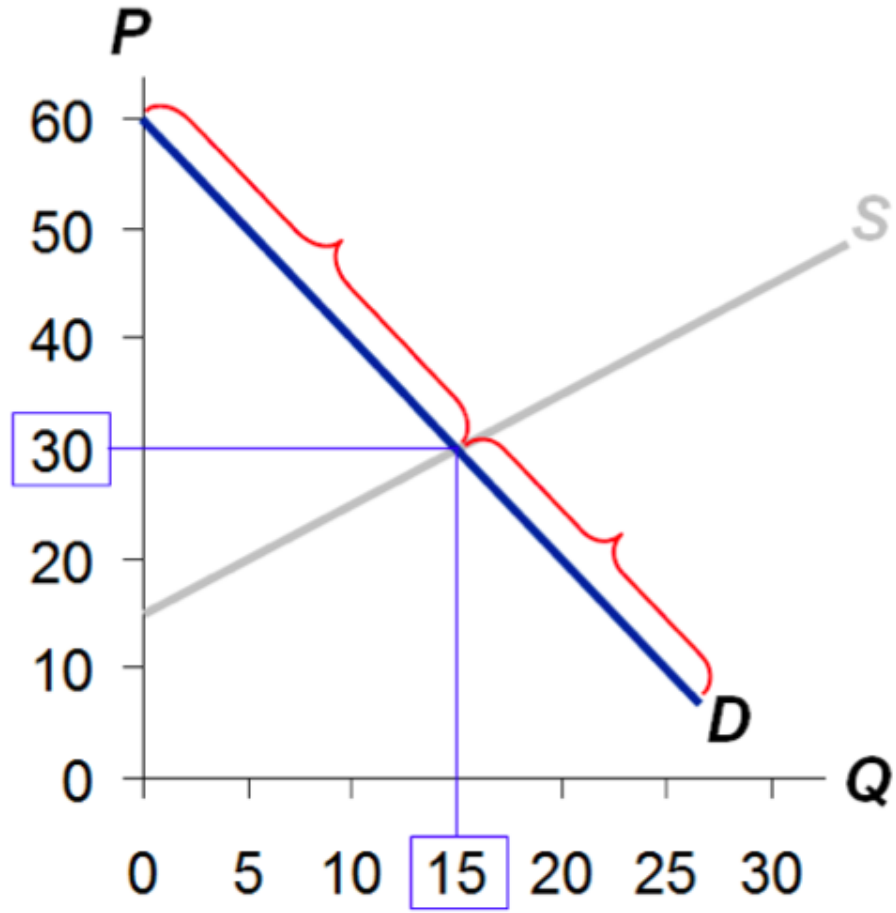


Which buyers consume the good?

Every buyer whose WTP is ≥ $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.*

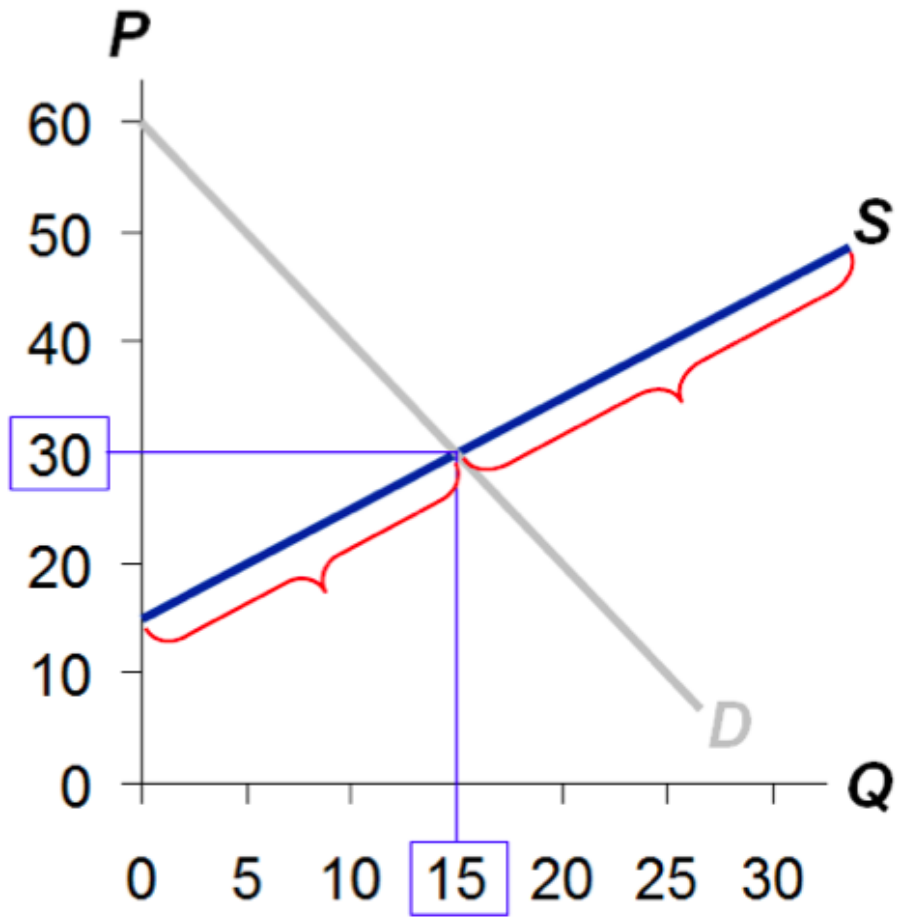


Which sellers produce the good?

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

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

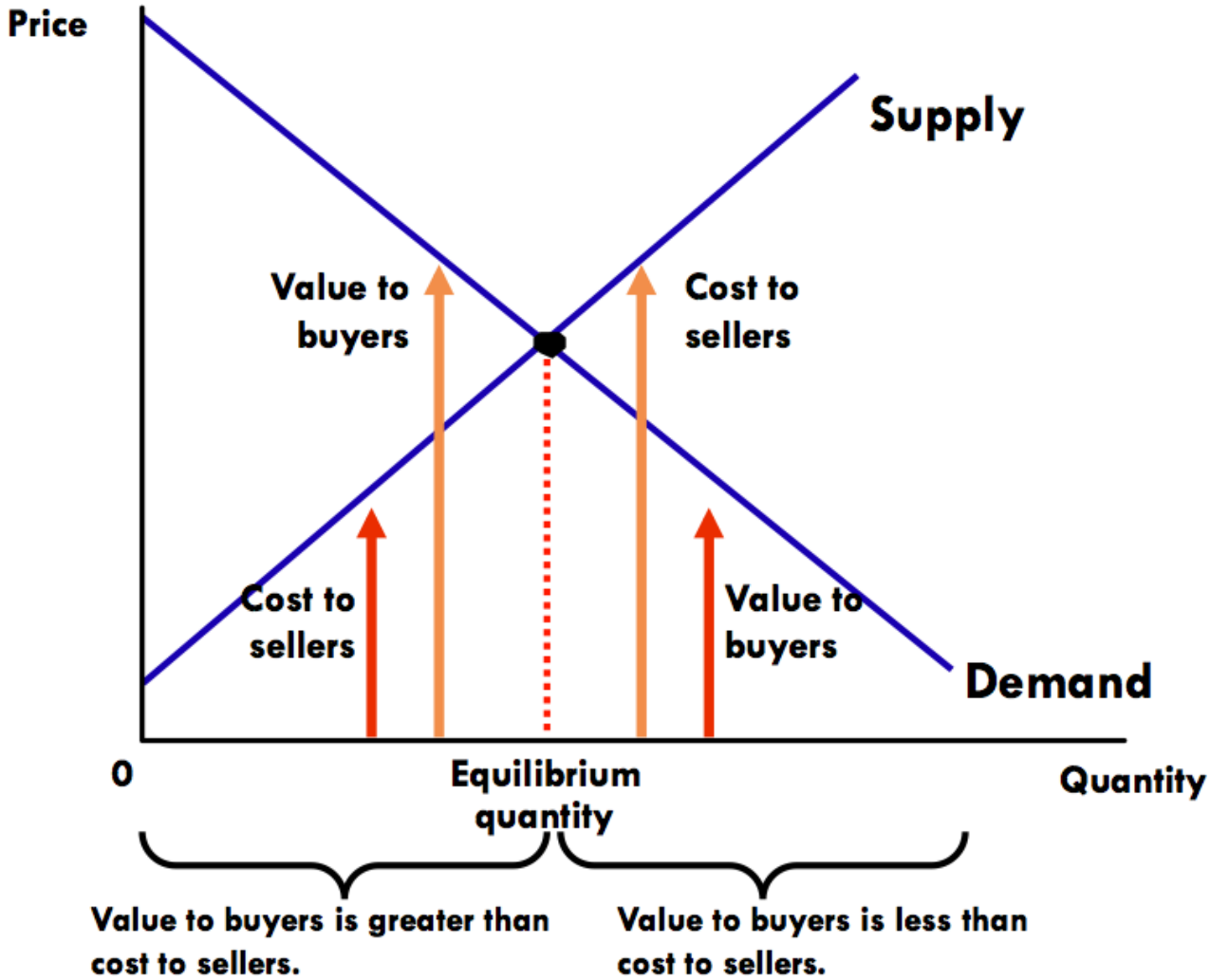
So, *the sellers with the lowest cost produce the good.*



Efficient Allocation of Consumption and Production

- Market allocates goods to buyers who value it most highly.
- Market allocates production of goods to sellers who can produce at lower cost.

Efficient Quantity



First Welfare Theorem

Theorem (First Welfare Theorem)

Under the assumptions that

1. *market structrure is perfectly competitive*
2. *no externalities*

the unregulated market allocation (the competitive equilibrium) is efficient. No other outcome achieves higher total surplus.

First Welfare Theorem

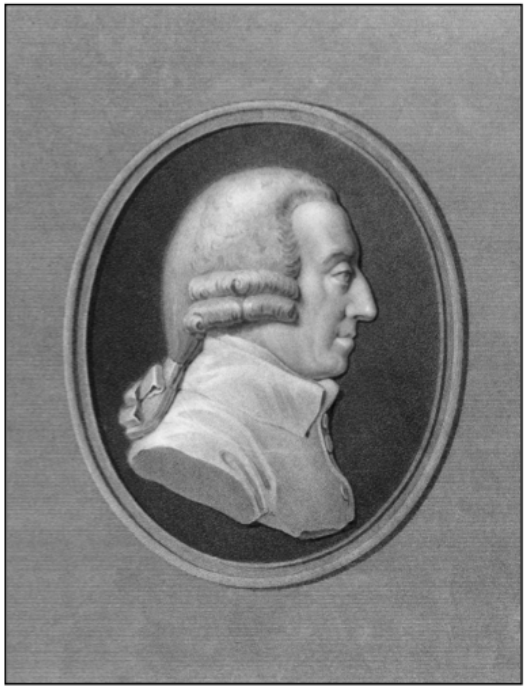
The first welfare theorem is sometimes referred to as the invisible hand theorem. It is an analytical formulation of Adam Smith's theory and gives the sufficient conditions under which free market produces the most efficient outcome.

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 ("**benevolent dictator**").
- 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 is part of the reason why centrally-planned economics are not very efficient.

Adam Smith and the Invisible Hand

Passages from *The Wealth of Nations*, 1776



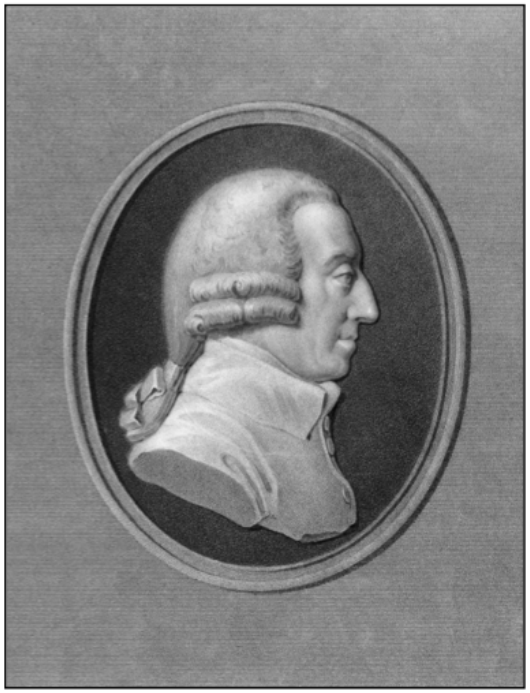
Adam Smith,
1723-1790

"Man has almost constant occasion for the help of his brethren, and it is vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favor, and show them that it is for their own advantage to do for him what he requires of them…

It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest.…

Adam Smith and the Invisible Hand

Passages from *The Wealth of Nations*, 1776



Adam Smith, 1723-1790

"Every individual…neither intends to promote the public interest, nor knows how much he is promoting it….

He intends only his own gain, and he is in this, as in many other cases, led by **an invisible hand** to promote an end which was no part of his intention.

Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it."

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Reference

Mankiw, N. G. (2017). *Principles of Economics* (8th ed.). Boston, MA: Cengage Learning.