

Unit 2: Supply, Demand, and Consumer Choice

DEMAND DEFINED

What is Demand?

Demand is the different quantities of goods that consumers are **willing** and **able** to buy at different prices.

(Ex: Bill Gates is able to purchase a Ferrari, but if he isn't willing he has NO demand for one)

What is the Law of Demand?

The law of demand states There is an INVERSE relationship between price and quantity demanded

Why does the Law of Demand occur?

The law of demand is the result of three separate behavior patterns that overlap:

1.The Substitution effect

2.The Income effect

3.The Law of Diminishing Marginal Utility

We will define and explain each...

Why does the Law of Demand occur?



1. The Substitution Effect

- If the price goes up for a product, consumer buys less of that product and more of another substitute product (and vice versa)



2. The Income Effect

- If the price goes down for a product, the purchasing power increases for consumers - allowing them to purchase more.

Why does the Law of Demand occur?

3. Law of Diminishing Marginal Utility



U-TIL-IT-Y

- Utility = Satisfaction
- We buy goods because we get utility from them
- The **law of diminishing marginal utility** states that as you consume more units of any good, the additional satisfaction from each additional unit will eventually start to decrease
- In other words, the more you buy of ANY GOOD the less satisfaction you get from each new unit.

Discussion Questions:

1. What does this have to do with the Law of Demand?
2. How does this effect the pricing of businesses?

The Demand Curve

- **A demand curve is a graphical representation of a demand schedule.**
- **The demand curve is downward sloping showing the inverse relationship between price (on the y-axis) and quantity demanded (on the x-axis)**
- **When reading a demand curve, assume all outside factors, such as income, are held constant. (This is called ceteris paribus)**

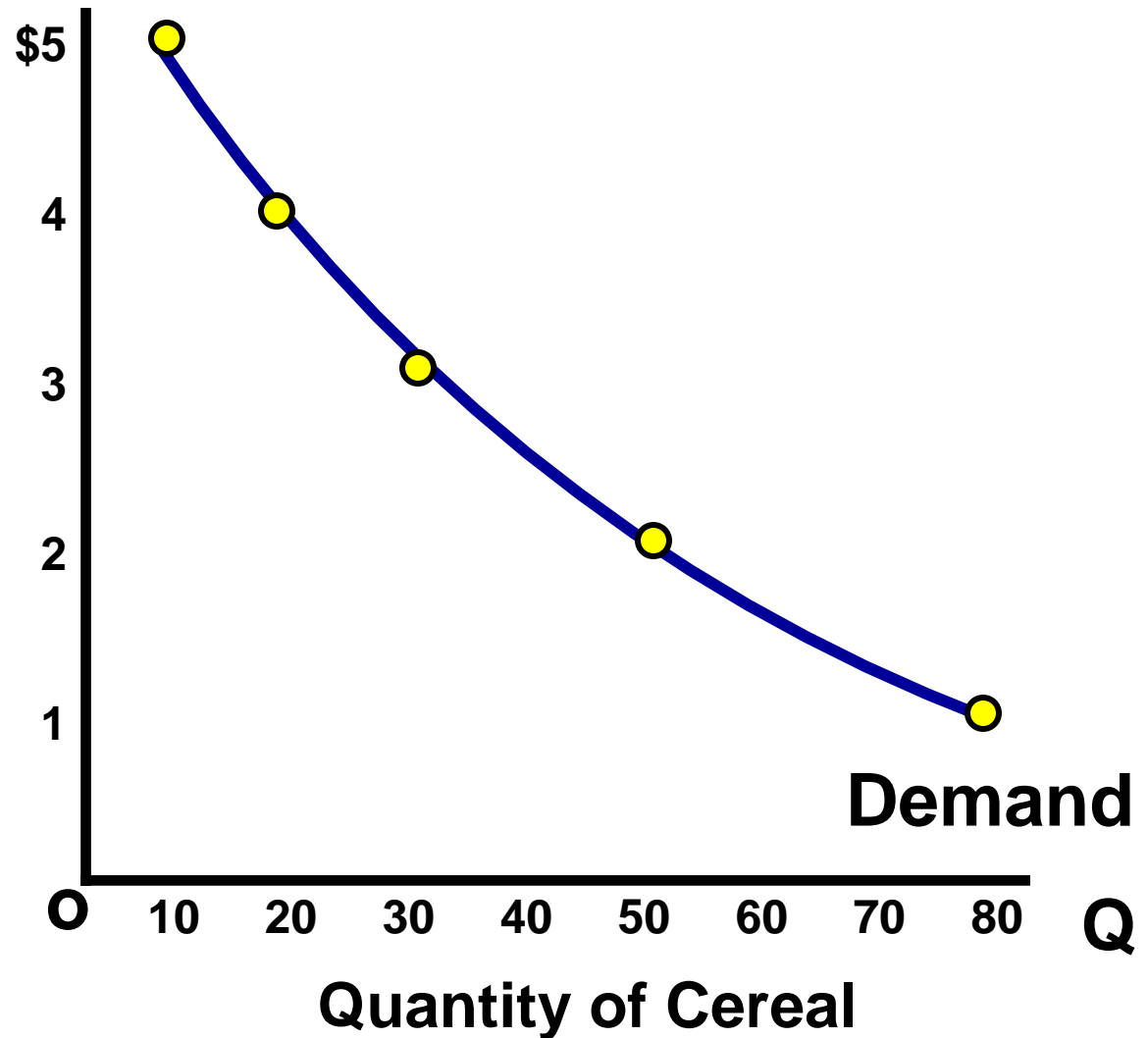
Let's draw a new demand curve for cereal...

GRAPHING DEMAND

Demand Schedule

Price of Cereal

Price	Quantity Demanded
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Where do you get the Market Demand?

Billy

Price	Q Demd
\$5	1
\$4	2
\$3	3
\$2	5
\$1	7

+

Jean

Price	Q Demd
\$5	0
\$4	1
\$3	2
\$2	3
\$1	5

+

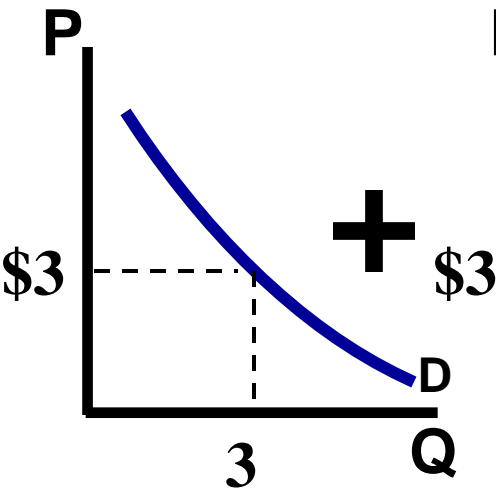
Other Individuals

Price	Q Demd
\$5	9
\$4	17
\$3	25
\$2	42
\$1	68

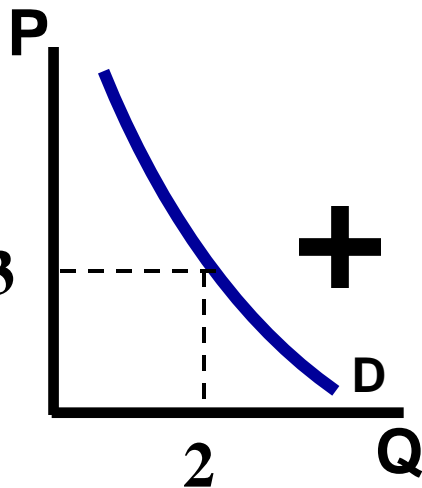
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Market

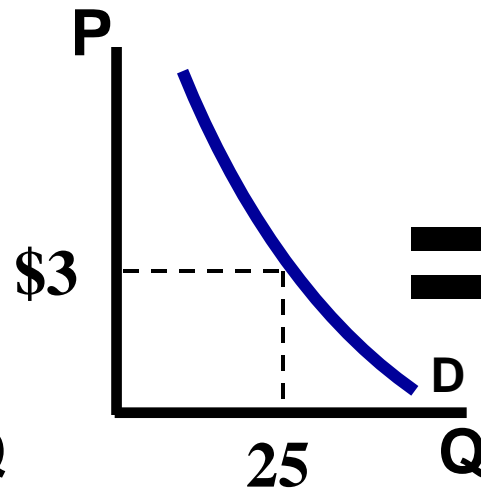
Price	Q Demd
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



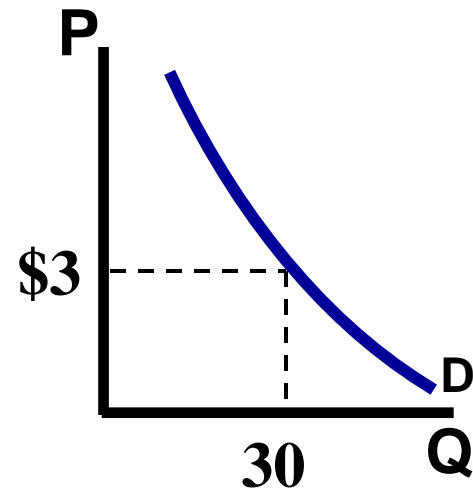
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Shifts in Demand

CHANGES IN DEMAND

- *Ceteris paribus* (“all other things held constant.”)
- When a change in price moves us along the demand curve, it does not shift the curve.
- A shift in demand occurs when more people want a good.

Changes in price

DON'T shift

the curve!

This is a change in quantity demanded, not a change in demand.

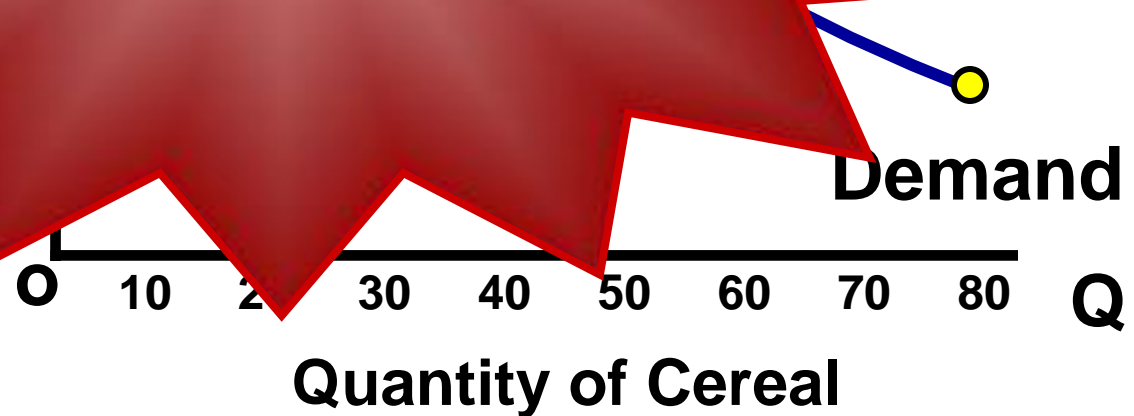
Change in Demand

**Demand
Schedule**

Price of Cereal

Price	Quantity
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

What if cereal
makes you smarter?

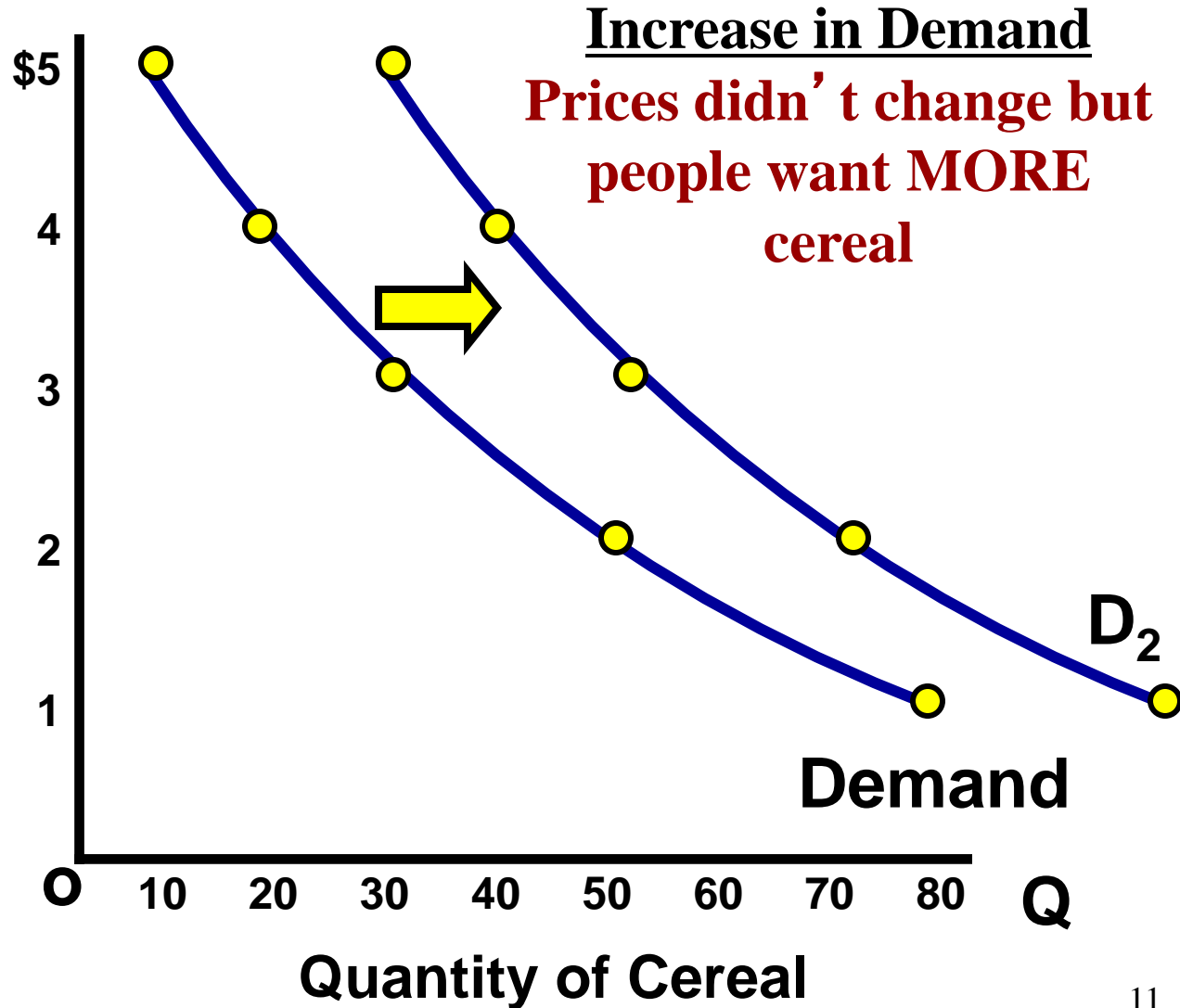


Change in Demand

Demand Schedule

Price of Cereal

Price	Quantity Demanded
\$5	10 30
\$4	20 40
\$3	30 50
\$2	50 70
\$1	80 100



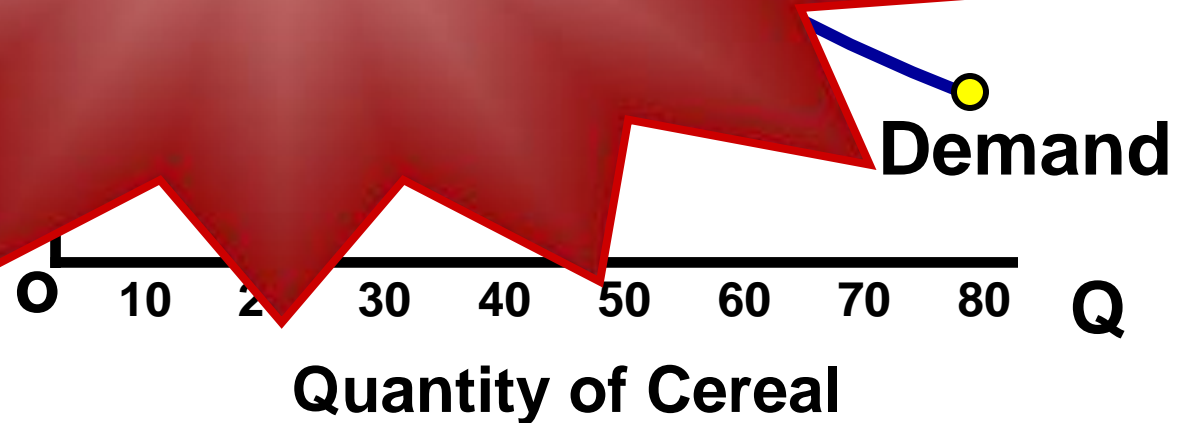
Change in Demand

**Demand
Schedule**

Price of Cereal

Price	Quantity
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

What if cereal
causes baldness?

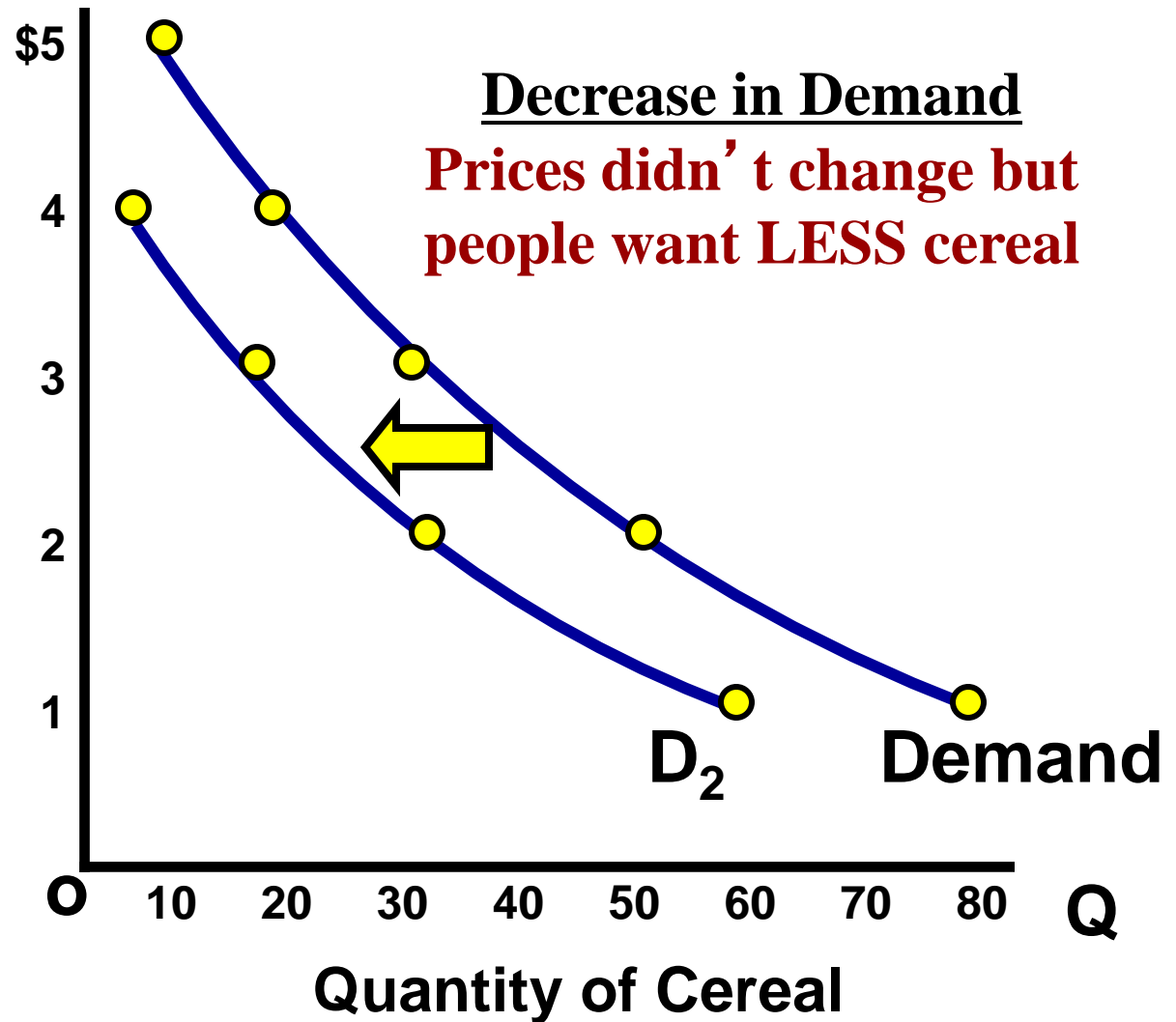


Change in Demand

Demand Schedule

Price of Cereal

Price	Quantity Demanded
\$5	10 0
\$4	20 5
\$3	30 20
\$2	50 30
\$1	80 60



What Causes a Shift in Demand?

5 Determinates (SHIFTERS) of Demand:

1. Tastes and Preferences
2. Number of Consumers
3. Price of Related Goods
4. Income
5. Future Expectations

Changes in PRICE don't shift the curve. It only causes movement along the curve.

Prices of Related Goods

The demand curve for one good can be affected by a change in the price of ANOTHER related good.

1. Substitutes are goods used in place of one another.

- If the price of one increases, the demand for the other will increase (or vice versa)
- **Ex: If price of Pepsi falls, demand for coke will...**

2. Complements are two goods that are bought and used together.

- If the price of one increase, the demand for the other will fall. (or vice versa)
- **Ex: If price of skis falls, demand for ski boots will...**

Income

The incomes of consumer change the demand, but how depends on the type of good.

1. Normal Goods

- As income increases, demand increases
- As income falls, demand falls
- Ex: Luxury cars, Sea Food, jewelry, homes

2. Inferior Goods

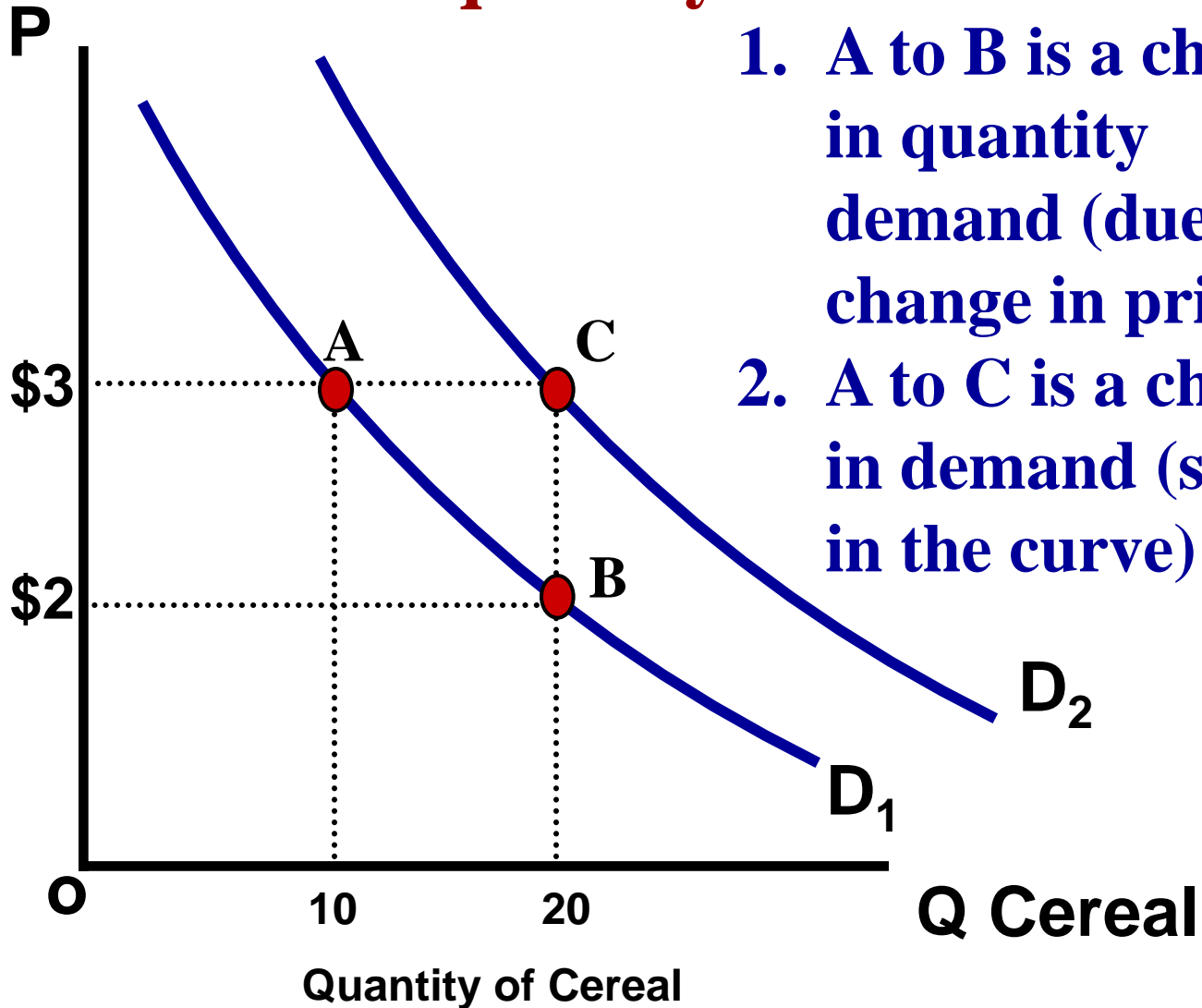
- As income increases, demand falls
- As income falls, demand increases
- Ex: Top Romen, used cars, used cloths,



Change in Qd vs. Change in Demand

There are two ways to increase quantity from 10 to 20

Price of Cereal



1. A to B is a change in quantity demanded (due to a change in price)
2. A to C is a change in demand (shift in the curve)

Practice

**First, identify the determinant (shifter) then
decide if demand will increase or decrease**

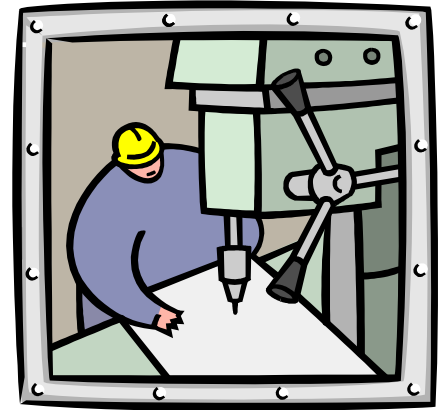
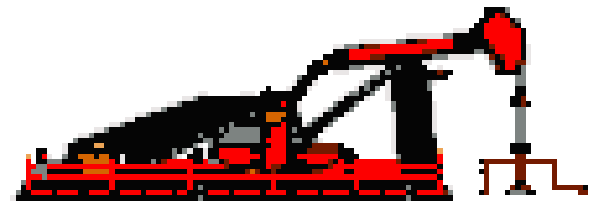
	Shifter	Increase or Decrease	Left or Right
1			
2			
3			
4			
5			
6			
7			
8			

Practice

First identify the determinant (Shifter). Then decide if demand will increase or decrease

Hamburgers (a normal good)

- 1. Population boom**
- 2. Incomes fall due to recession**
- 3. Price for Carne Asada burritos falls to \$1**
- 4. Price increases to \$5 for hamburgers**
- 5. New health craze- “No ground beef”**
- 6. Hamburger restaurants announce that they will significantly increase prices NEXT month**
- 7. Government heavily taxes shake and fries causes their prices to quadruple.**
- 8. Restaurants lower price of burgers to \$.50**



Supply



Supply Defined

What is supply?

Supply is the different quantities of a good that sellers are **willing** and **able** to sell (produce) at different prices.

What is the Law of Supply?

There is a **DIRECT** (or positive) relationship between price and quantity supplied.

- **As price increases, the quantity producers make increases**
- **As price falls, the quantity producers make falls.**

Why? Because, at higher prices profit seeking firms have an incentive to produce more.

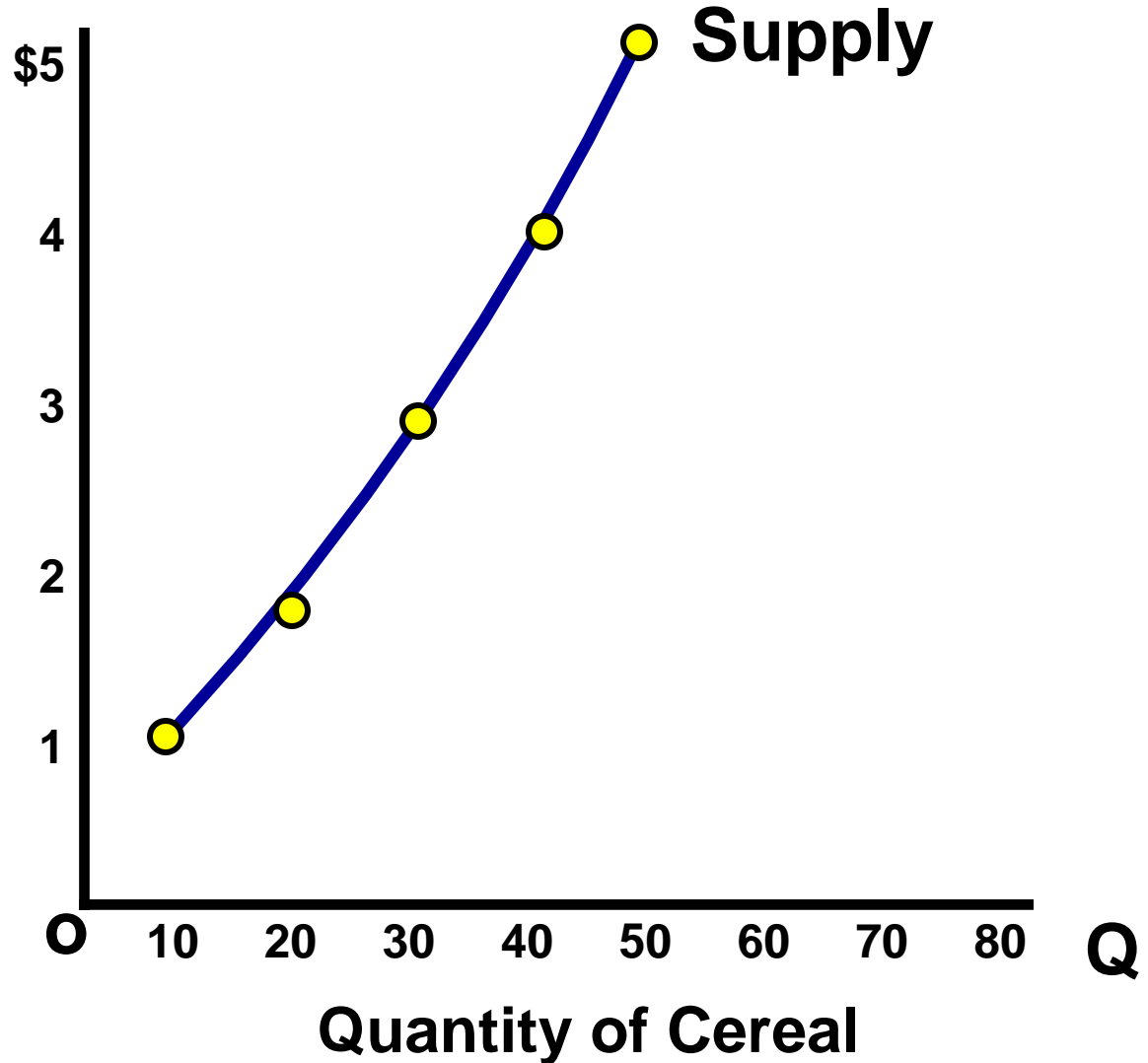
EXAMPLE: Mowing Lawns

GRAPHING SUPPLY

Supply Schedule

Price of Cereal

Price	Quantity Supplied
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10



GRAPHING SUPPLY

**Supply
Schedule**

Price of Cereal

Supply

Price	Quantity
\$5	
\$4	
\$3	
\$2	
\$1	10

**What if new
companies start making
cereal?**

0 10 20 30 40 50 60 70 80 Q

Quantity of Cereal

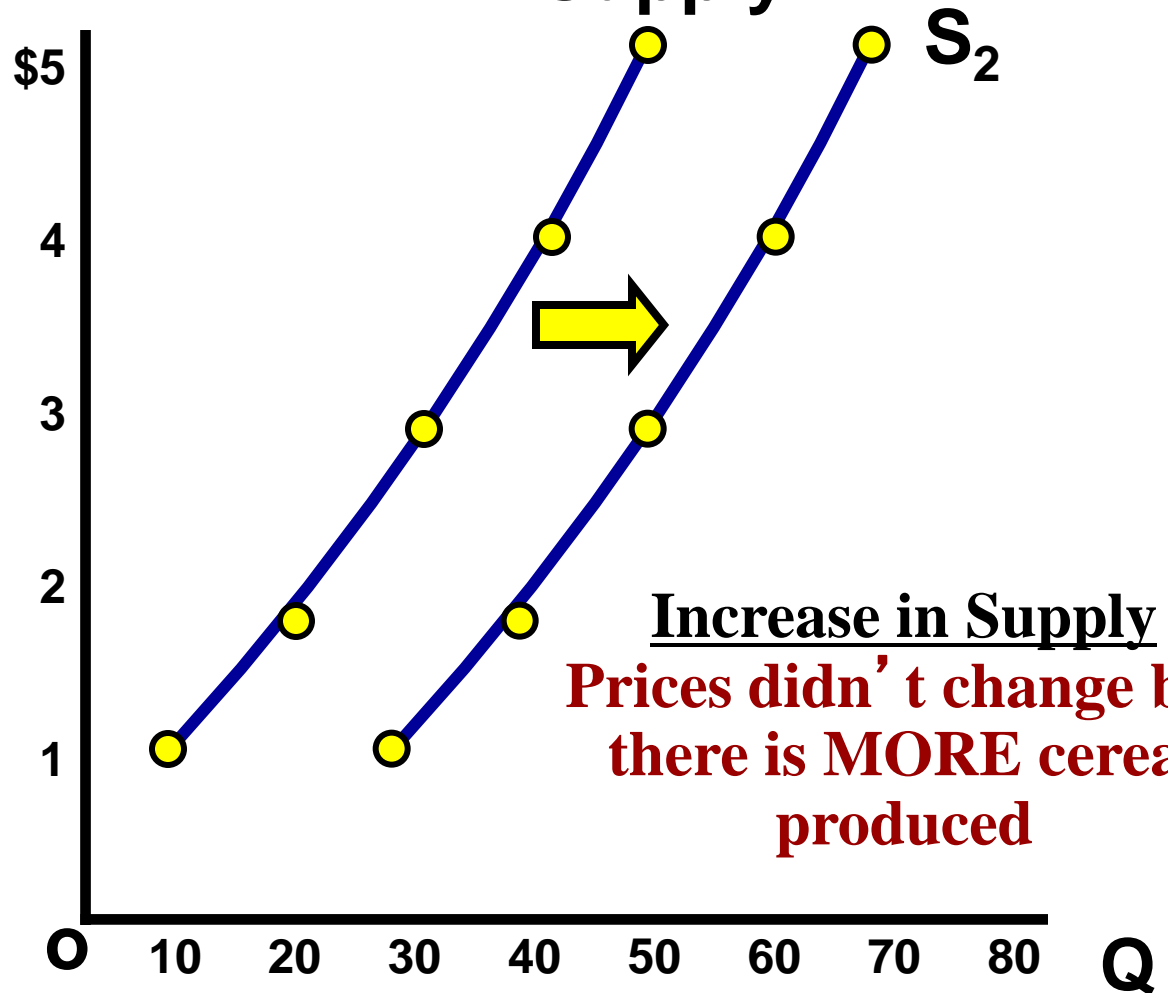
Change in Supply

Supply Schedule

Price	Quantity Supplied
\$5	50 70
\$4	40 60
\$3	30 50
\$2	20 40
\$1	10 30

Price of Cereal

Supply



Quantity of Cereal

Change in Supply

Supply
Schedule

Price of Cereal

Supply

Price	Quantity
\$5	
\$4	
\$3	
\$2	
\$1	10

What if a drought
destroys corn and wheat
crops?

0 10 20 30 40 50 60 70 80 Q

Quantity of Cereal

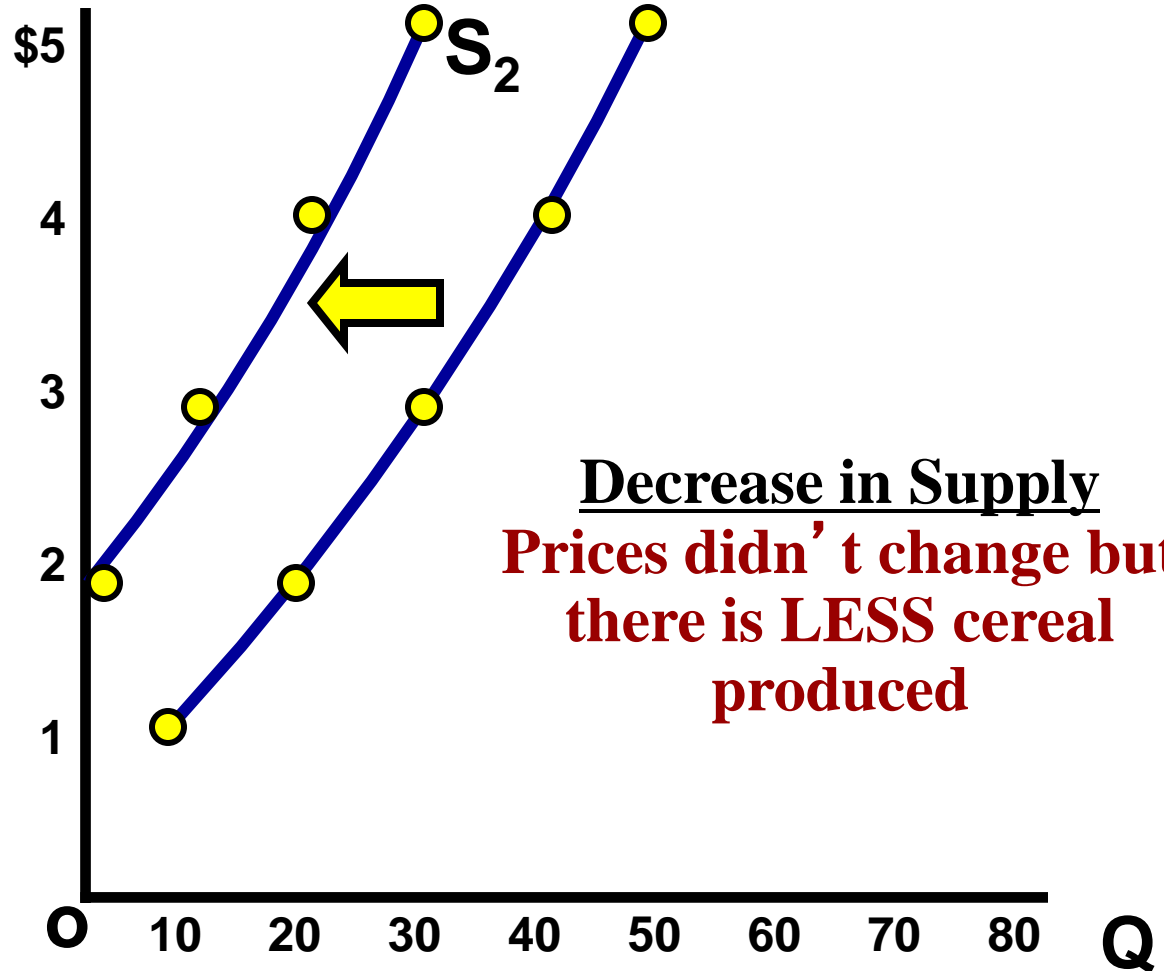
Change in Supply

Supply Schedule

Price	Quantity Supplied
\$5	50 30
\$4	40 20
\$3	30 10
\$2	20 1
\$1	10 0

Price of Cereal

Supply



Quantity of Cereal

6 Determinants (SHIFTERS) of Supply

1. **Prices/Availability of inputs (resources)**
2. **Number of Sellers**
3. **Technology**
4. **Government Action: Taxes & Subsidies**

Subsidies

A **subsidy** is a government payment that supports a business or market. Subsidies cause the supply of a good to increase.

5. **Opportunity Cost of Alternative Production**
6. **Expectations of Future Profit**

Changes in PRICE don't shift the curve. It only causes movement along the curve.

Supply Practice

**First, identify the determinant (shifter) then
decide if supply will increase or decrease**

	Shifter	Increase or Decrease	Left or Right
1			
2			
3			
4			
5			
6			

Supply Practice

1. Which determinant (SHIFTER)?
2. Increase or decrease?
3. Which direction will curve shift?

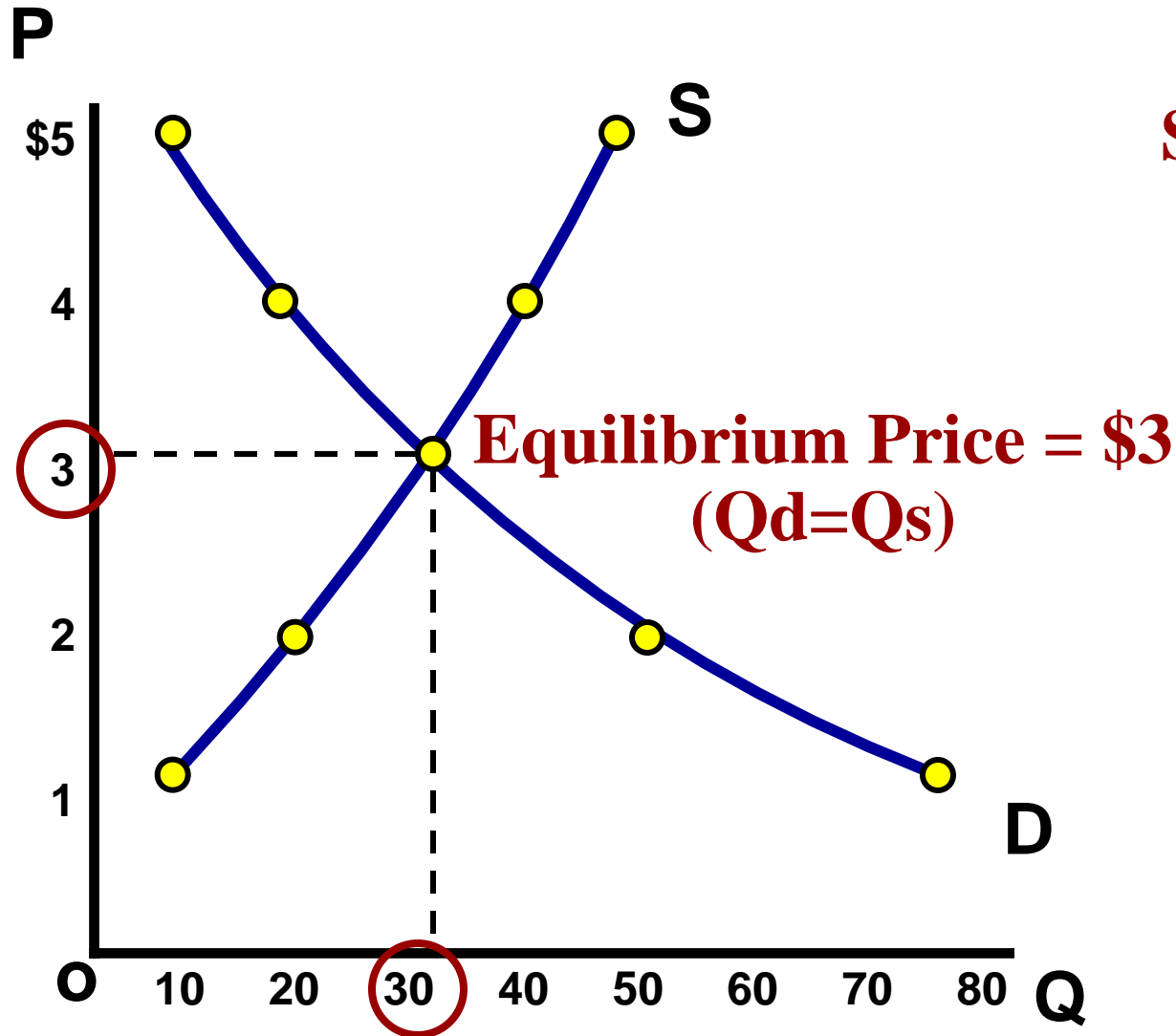
Hamburgers

1. Mad cow kills 20% of cows
2. Price of burgers increase 30%
3. Government taxes burger producers
4. Restaurants can produce burgers and/or tacos. A demand increase causes the price for tacos to increase 500%
5. New bun baking technology cuts production time in half
6. Minimum wage increases to \$10

Supply and Demand are put together to determine equilibrium price and equilibrium quantity

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Equilibrium Quantity is 30

Supply and Demand are put together to determine equilibrium price and equilibrium quantity

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10



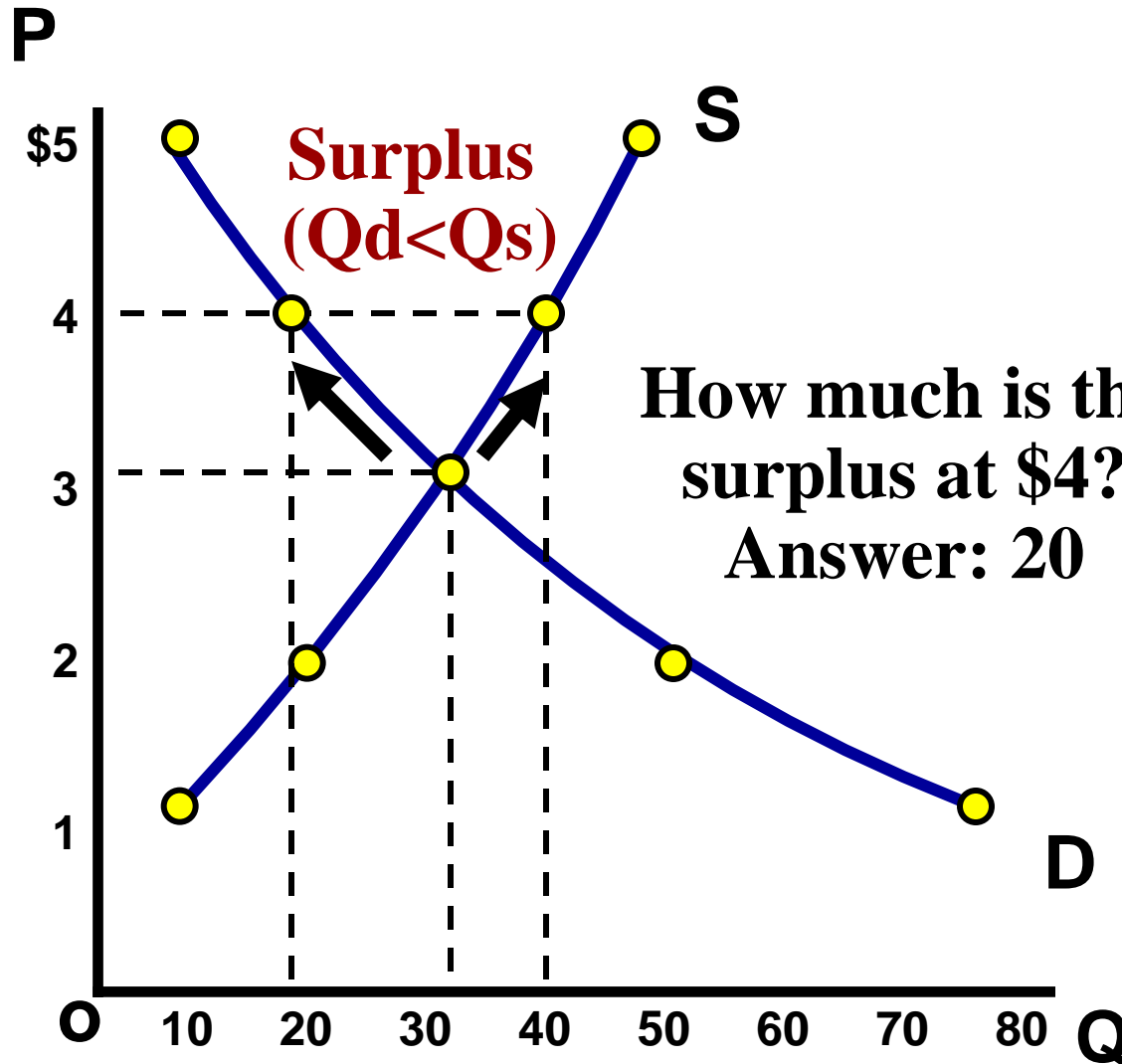
What if the price increases to \$4?

O 10 20 30 40 50 60 70 80 Q

At \$4, there is disequilibrium. The quantity demanded is less than quantity supplied.

Demand Schedule

P	Qd
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



How much is the surplus at \$4?
Answer: 20

Supply Schedule

P	Qs
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

How much is the surplus if the price is \$5?

**Demand
Schedule**

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80

**Supply
Schedule**

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

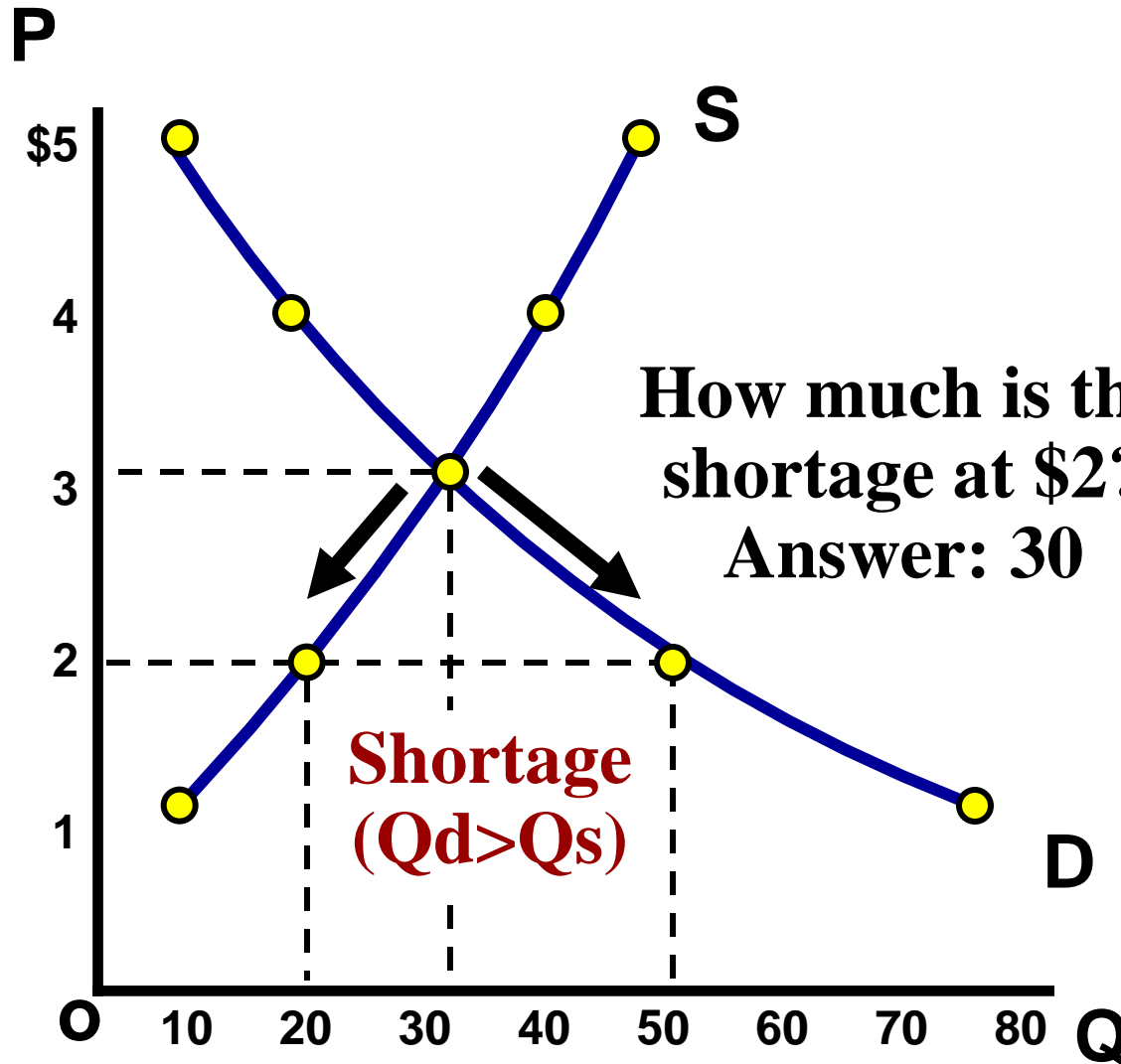
What if the price
decreases to \$2?

O 10 20 30 40 50 60 70 80 Q

At \$2, there is disequilibrium. The quantity demanded is greater than quantity supplied.

Demand Schedule

P	Qd
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



How much is the shortage at \$2?
Answer: 30

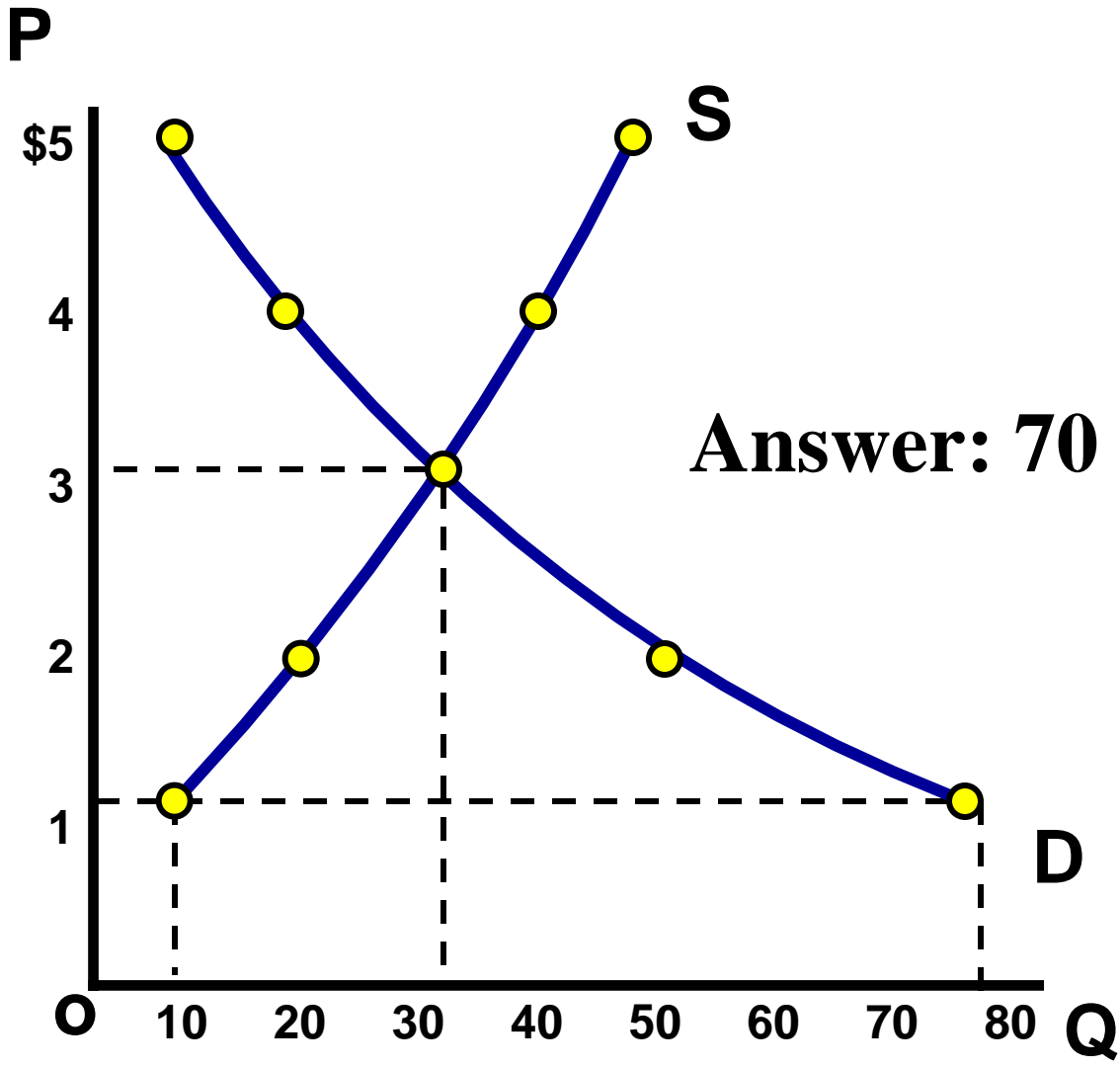
Supply Schedule

P	Qs
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

How much is the shortage if the price is \$1?

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



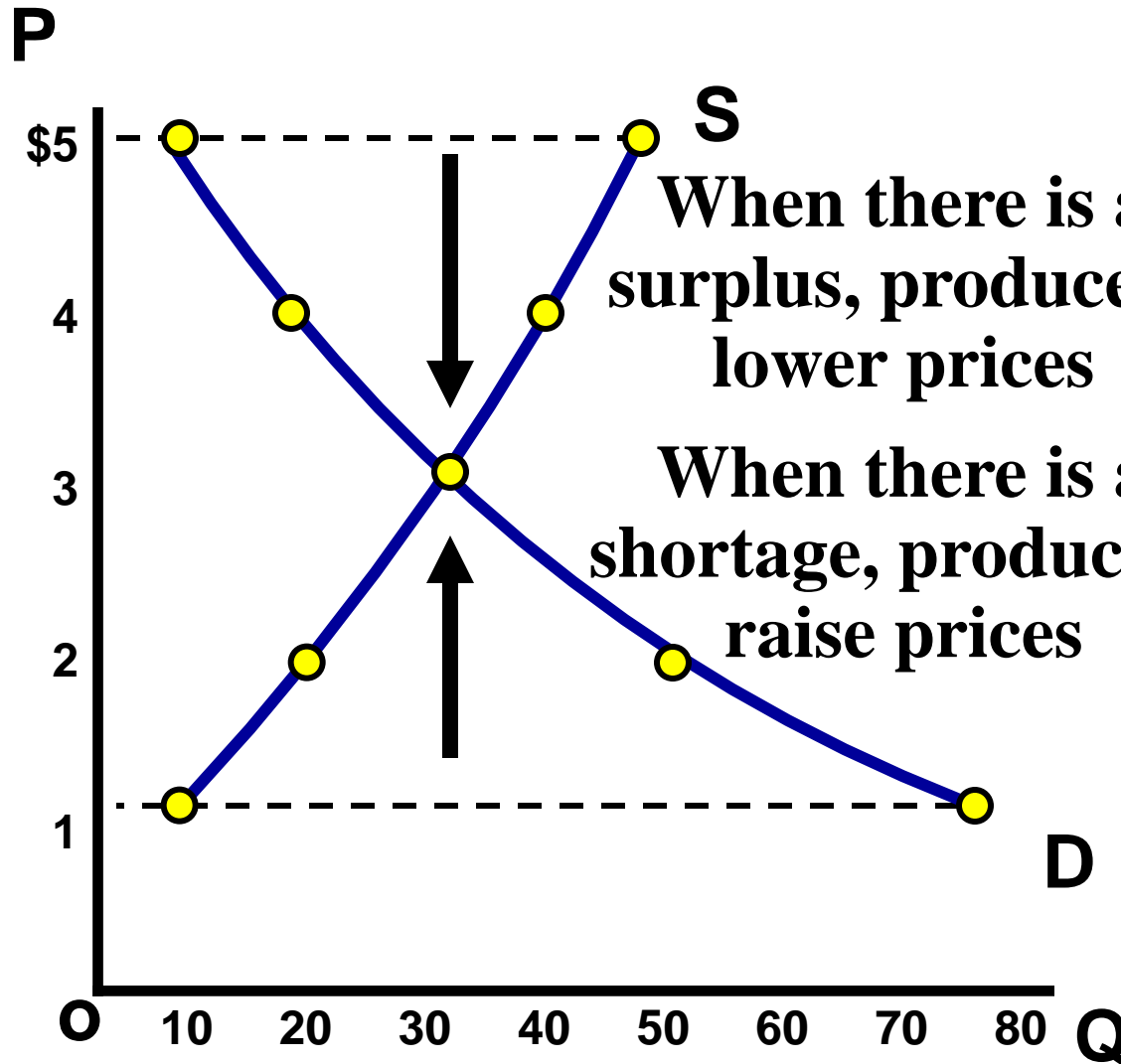
Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

The FREE MARKET system automatically pushes the price toward equilibrium.

Demand Schedule

P	Q _d
\$5	10
\$4	20
\$3	30
\$2	50
\$1	80



Supply Schedule

P	Q _s
\$5	50
\$4	40
\$3	30
\$2	20
\$1	10

Shifting Supply and Demand

Supply and Demand Analysis

Easy as 1, 2, 3

1. Before the change:

- Draw supply and demand
- Label original equilibrium price and quantity

2. The change:

- Did it affect supply or demand first?
- Which determinant caused the shift?
- Draw increase or decrease

3. After change:

- Label new equilibrium?
- What happens to Price? (increase or decrease)
- What happens to Quantity? (increase or decrease)

Let's Practice!

S&D Analysis Practice

- 1. Before Change (Draw equilibrium)**
- 2. The Change (S or D, Identify Shifter)**
- 3. After Change (Price and Quantity After)**

Analyze Hamburgers

- 1. Price of sushi (a substitute) increases**
- 2. New grilling technology cuts production time in half**
- 3. Price of burgers falls from \$3 to \$1.**
- 4. Price for ground beef triples**
- 5. Human fingers found in multiple burger restaurants.**

Double Shifts



- **Suppose the demand for sports cars fell at the same time as production technology improved.**
- **Use S&D Analysis to show what will happen to PRICE and QUANTITY.**

If TWO curves shift at the same time, EITHER price or quantity will be indeterminate.

Voluntary Exchange Terms

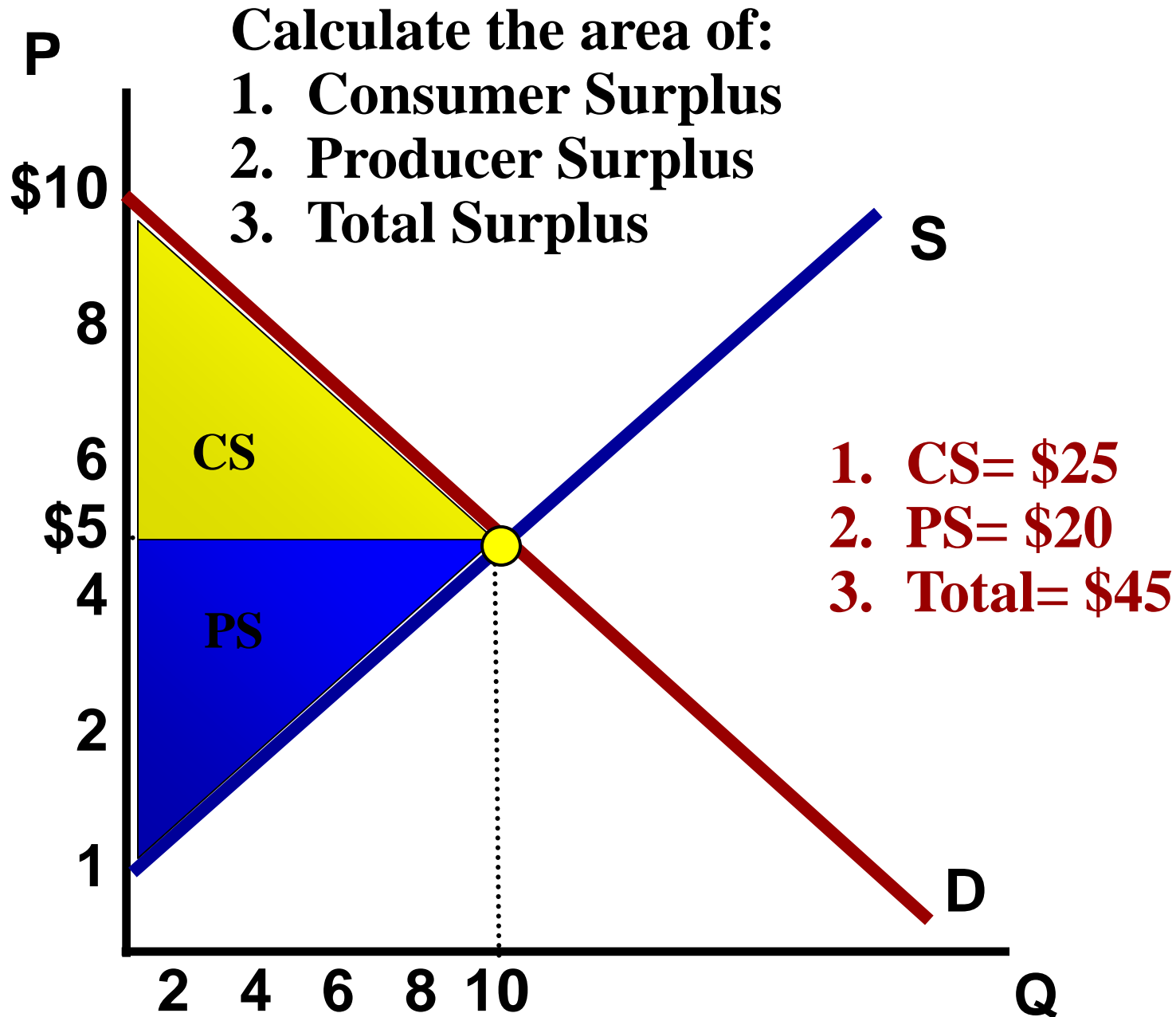
Consumer Surplus is the difference between what you are willing to pay and what you actually pay.

$$\text{CS} = \text{Buyer's Maximum} - \text{Price}$$

Producer's Surplus is the difference between the price the seller received and how much they were willing to sell it for.

$$\text{PS} = \text{Price} - \text{Seller's Minimum}$$

Consumer and Producer's Surplus



Unit 2: Supply, Demand, and Consumer Choice

Government Involvement

#1-Price Controls: Floors and Ceilings

#2-Import Quotas

#3-Subsidies

#4-Excise Taxes

#1-PRICE CONTROLS

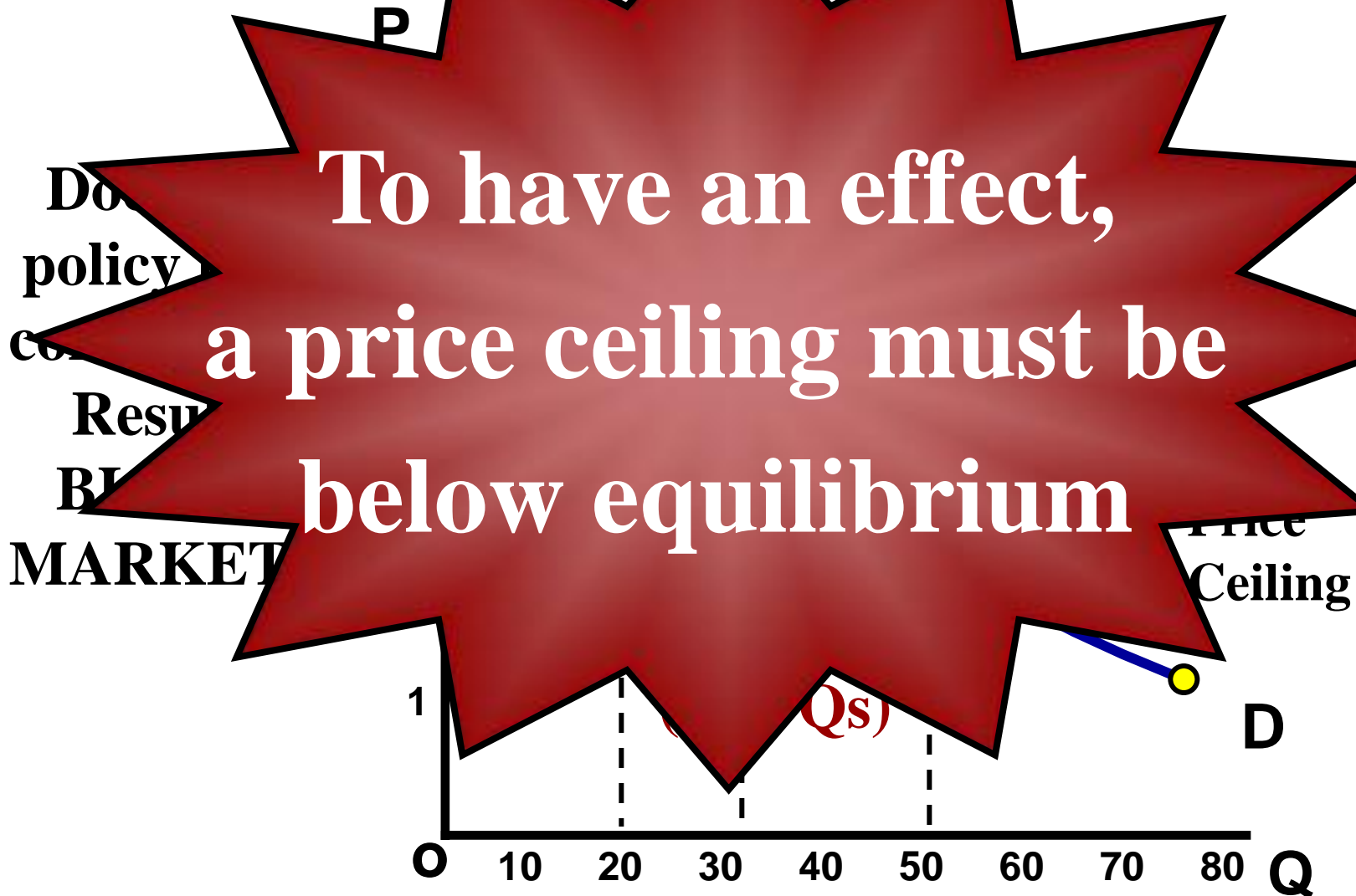
Who likes the idea of having a price ceiling on gas so prices will never go over \$1 per gallon?

Price Ceiling

Maximum legal price a seller can charge for a product.

Goal: Make affordable by keeping price from reaching Eq.

To have an effect,
a price ceiling must be
below equilibrium



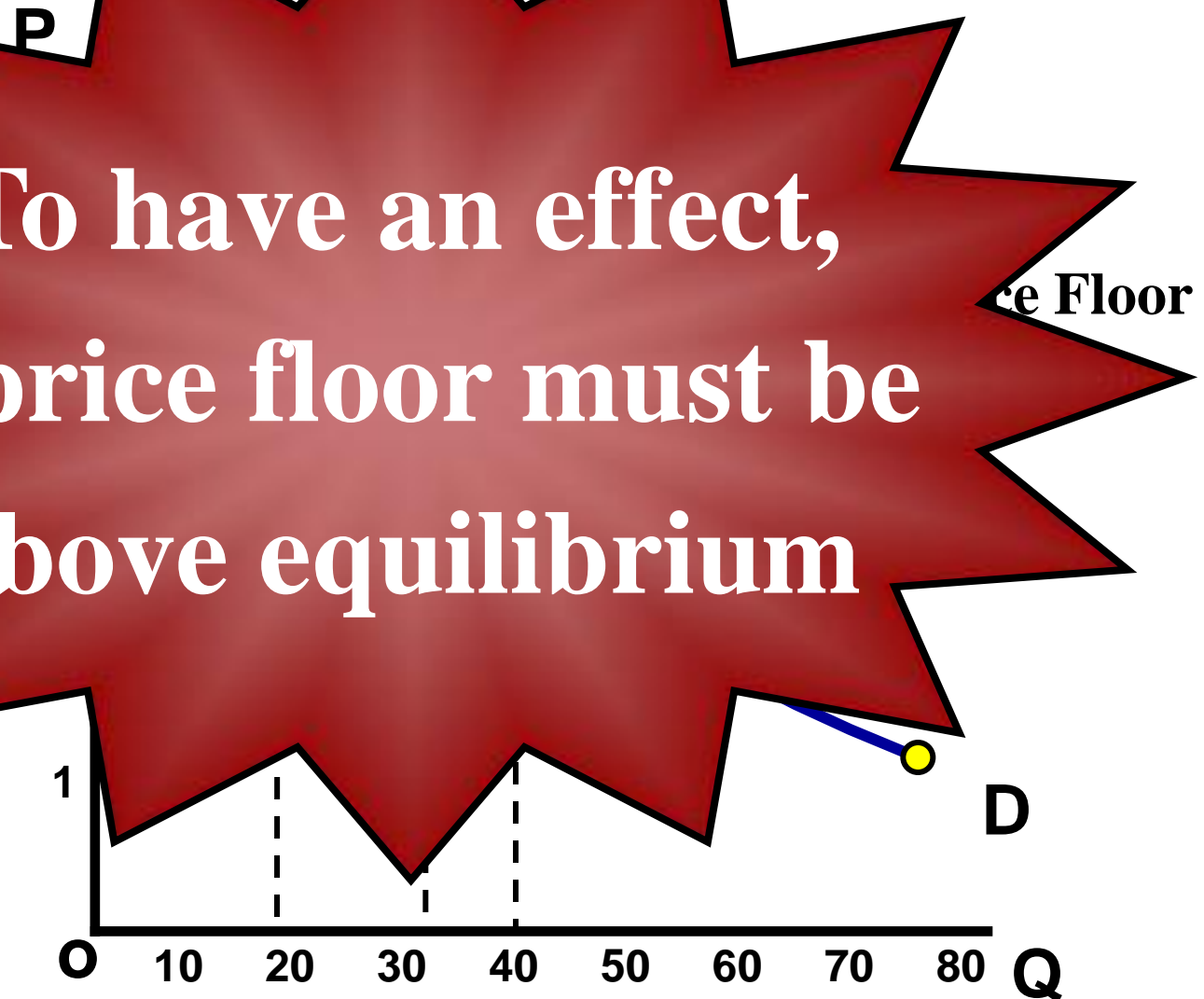
Price Floor

Minimum legal price a seller can sell a product.

Goal: Keep price high by keeping price from falling to Eq.

To have an effect,
a price floor must be
above equilibrium

Does this
policy help
corn
producers?



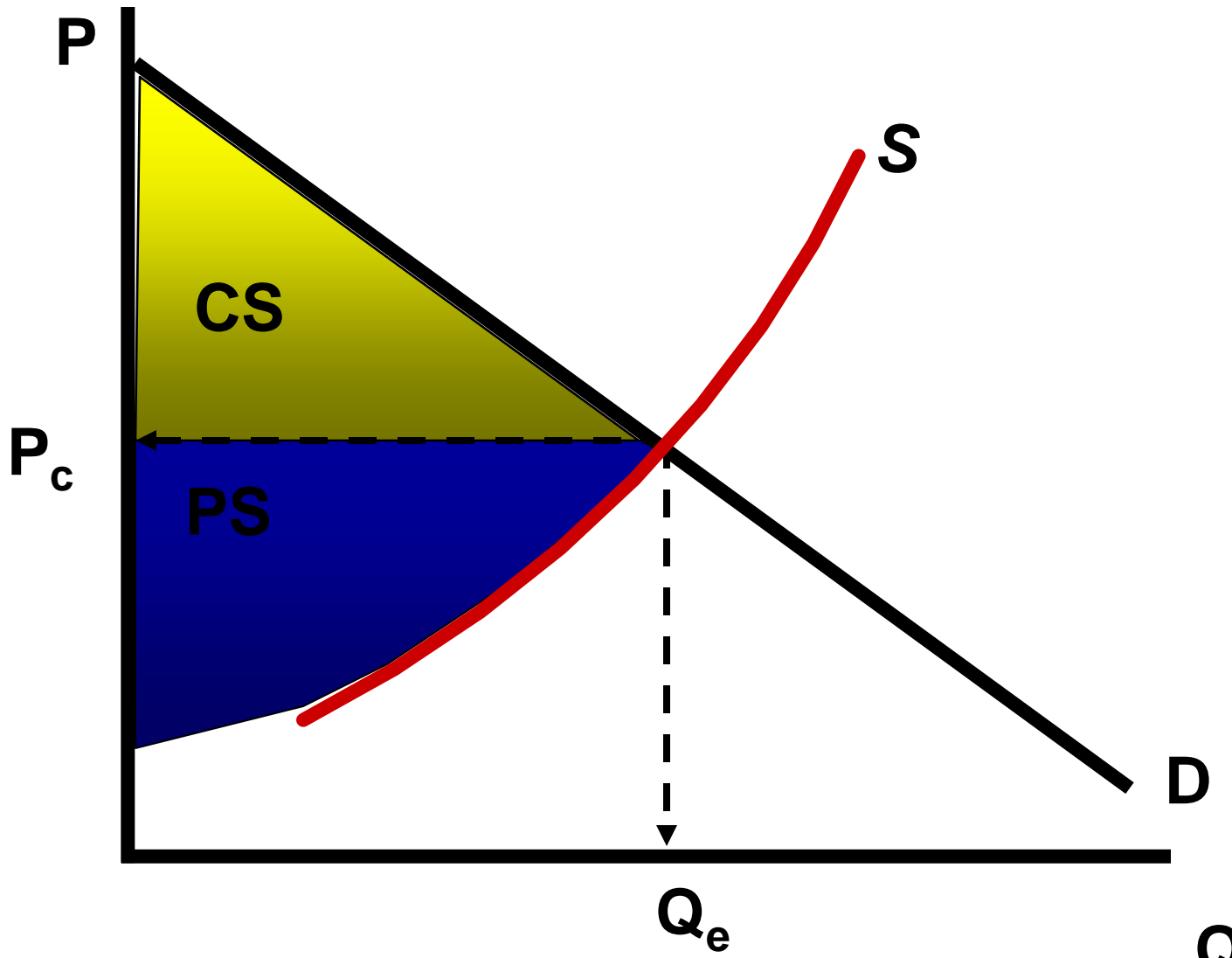
Practice Questions

- 1. Which of the following will occur if a legal price floor is placed on a good below its free market equilibrium?**
 - A. Surpluses will develop**
 - B. Shortages will develop**
 - C. Underground markets will develop**
 - D. The equilibrium price will ration the good**
 - E. The quantity sold will increase**

- 2. Which of the following statements about price control is true?**
 - A. A price ceiling causes a shortage if the ceiling price is above the equilibrium price**
 - B. A price floor causes a surplus if the price floor is below the equilibrium price**
 - C. Price ceilings and price floors result in a misallocation of resources**
 - D. Price floors above equilibrium cause a shortage**

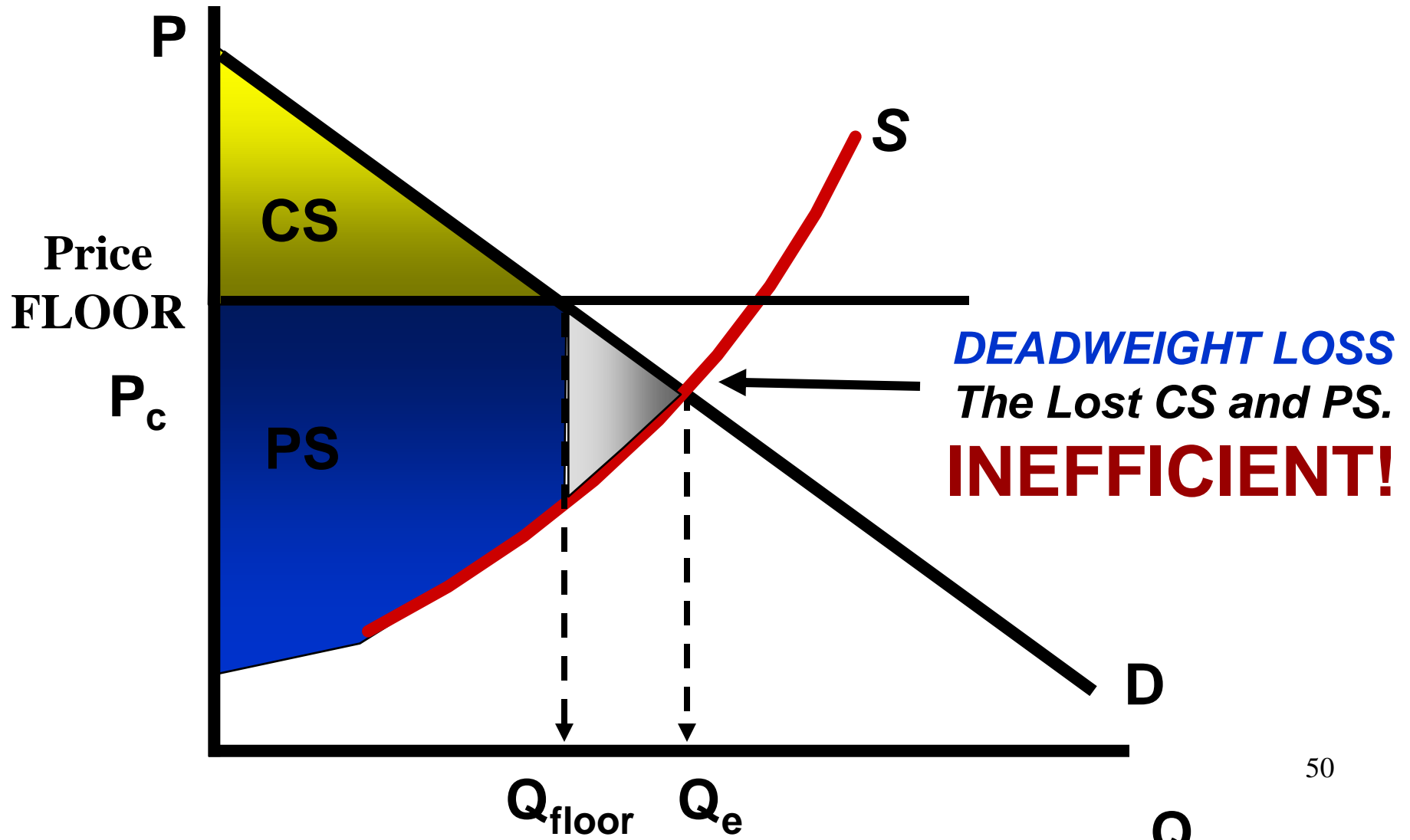
Are Price Controls Good or Bad?

To be “efficient” a market must maximize consumers and producers surplus



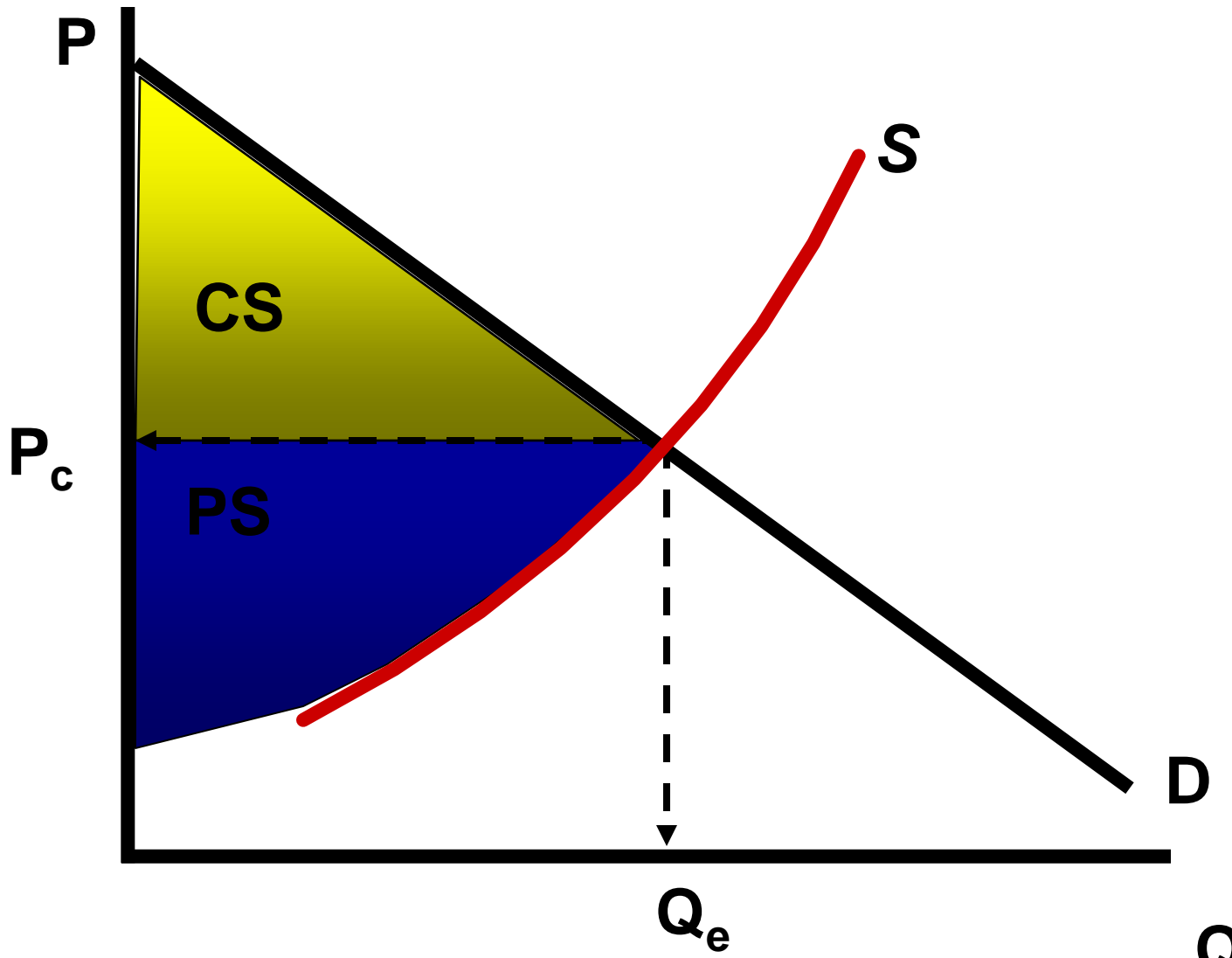
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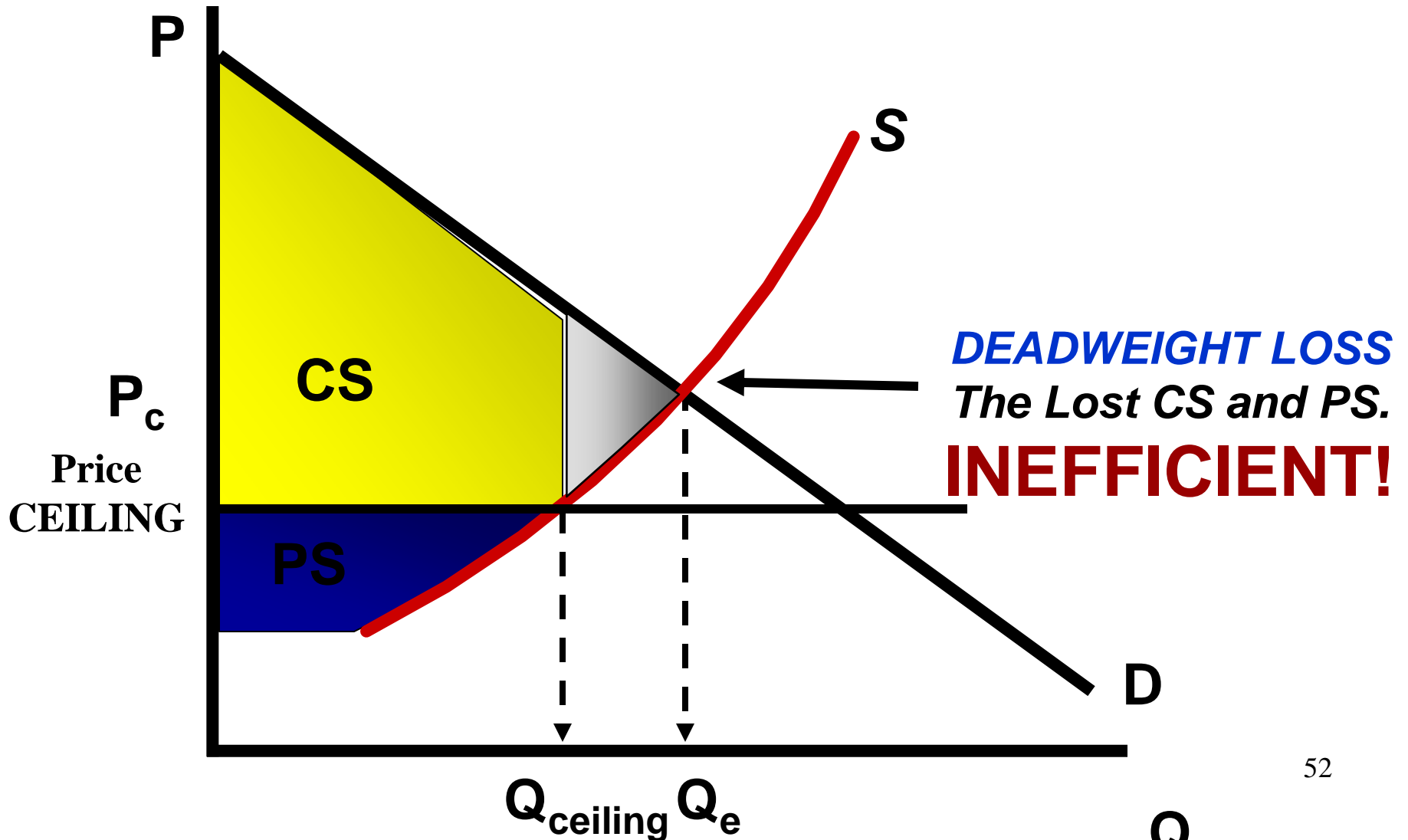
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Are Price Controls Good or Bad?

To be “efficient” a market must maximize consumers and producers surplus





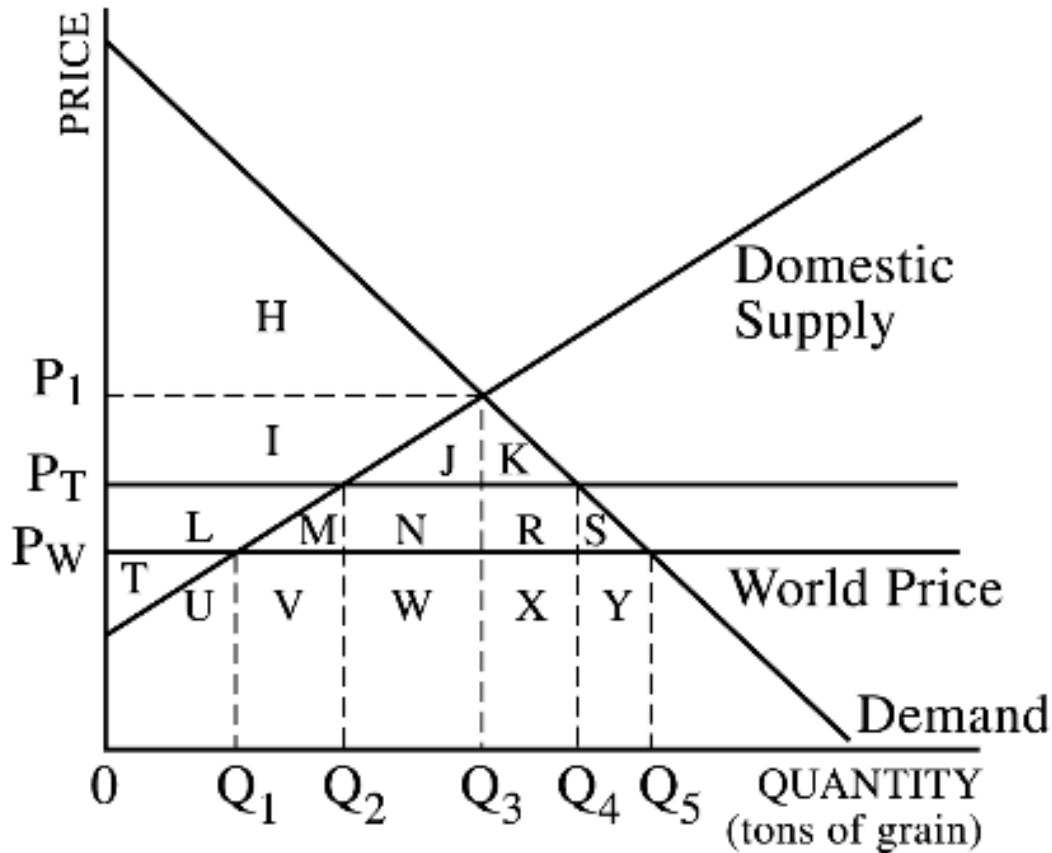
#2 Import Quotas

**A quota is a limit on number of exports.
The government sets the maximum amount that
can come in the country.**

Purpose:

- To protect domestic producers from a cheaper world price.**
- To prevent domestic unemployment**

International Trade and Quotas



This graphs show the domestic supply and demand for grain. The letters represent area.

Identify the following:

1. CS with no trade
2. PS with no trade
3. CS if we trade at world price (P_W)
4. PS if we trade at world price (P_W)
5. Amount we import at world price (P_W)
6. If the government sets a quota on imports of $Q_4 - Q_2$, what happens to CS and PS?

#3 Subsidies

**The government just gives producers money.
The goal is for them to make more of the goods
that the government thinks are important.**

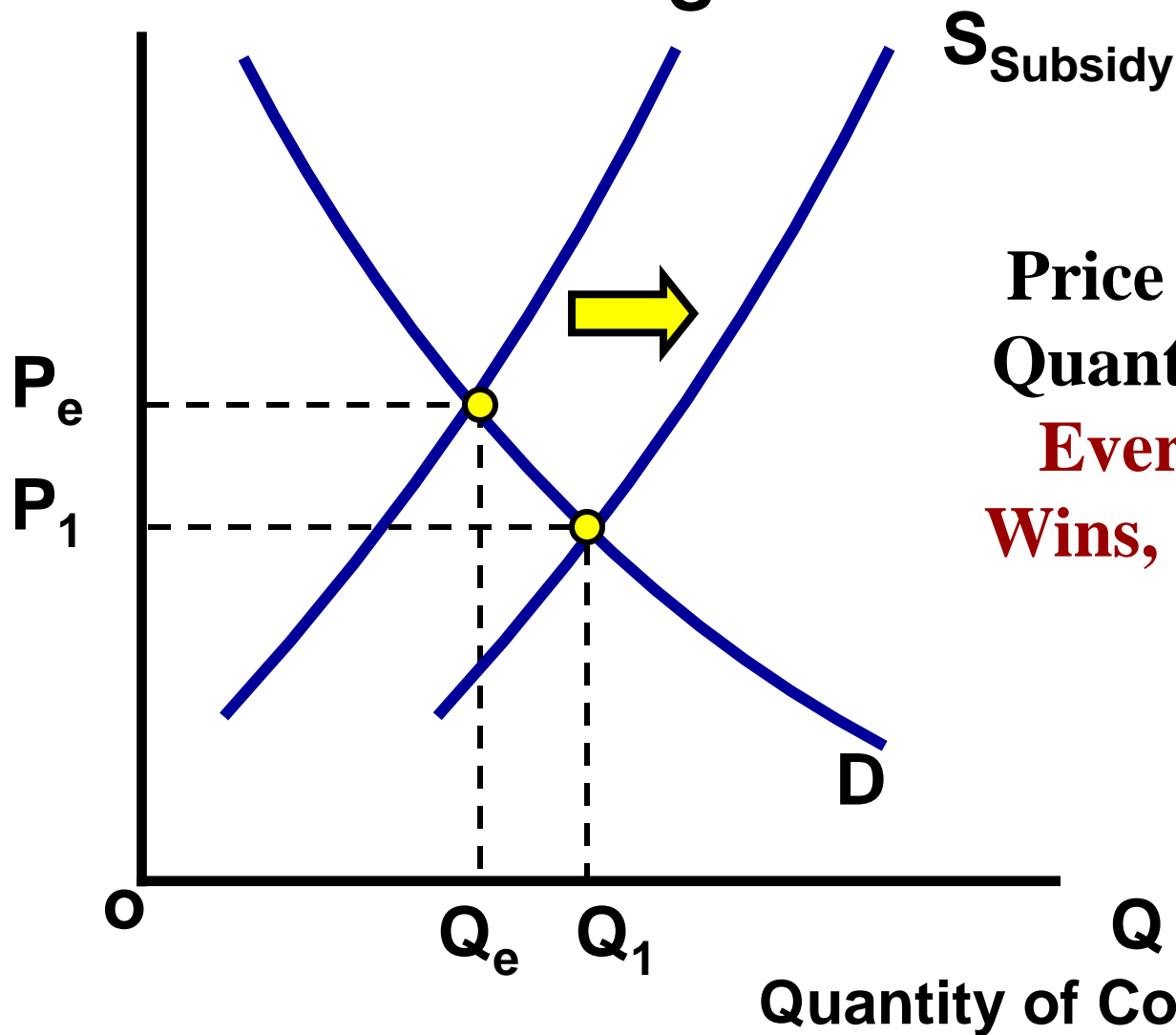
Ex:

- Agriculture (to prevent famine)**
- Pharmaceutical Companies**
- Environmentally Safe Vehicles**
- FAFSA**



Result of Subsidies to Corn Producers

Price of Corn



Price Down
Quantity Up
**Everyone
Wins, Right?**

Unit 2: Supply, Demand, and Consumer Choice

#4 Excise Taxes

Excise Tax = A per unit tax on producers

**For every unit made, the producer must pay \$
NOT a Lump Sum (one time only) Tax**

**The goal is for them to make less of the goods that
the government deems dangerous or unwanted.**



Ex:

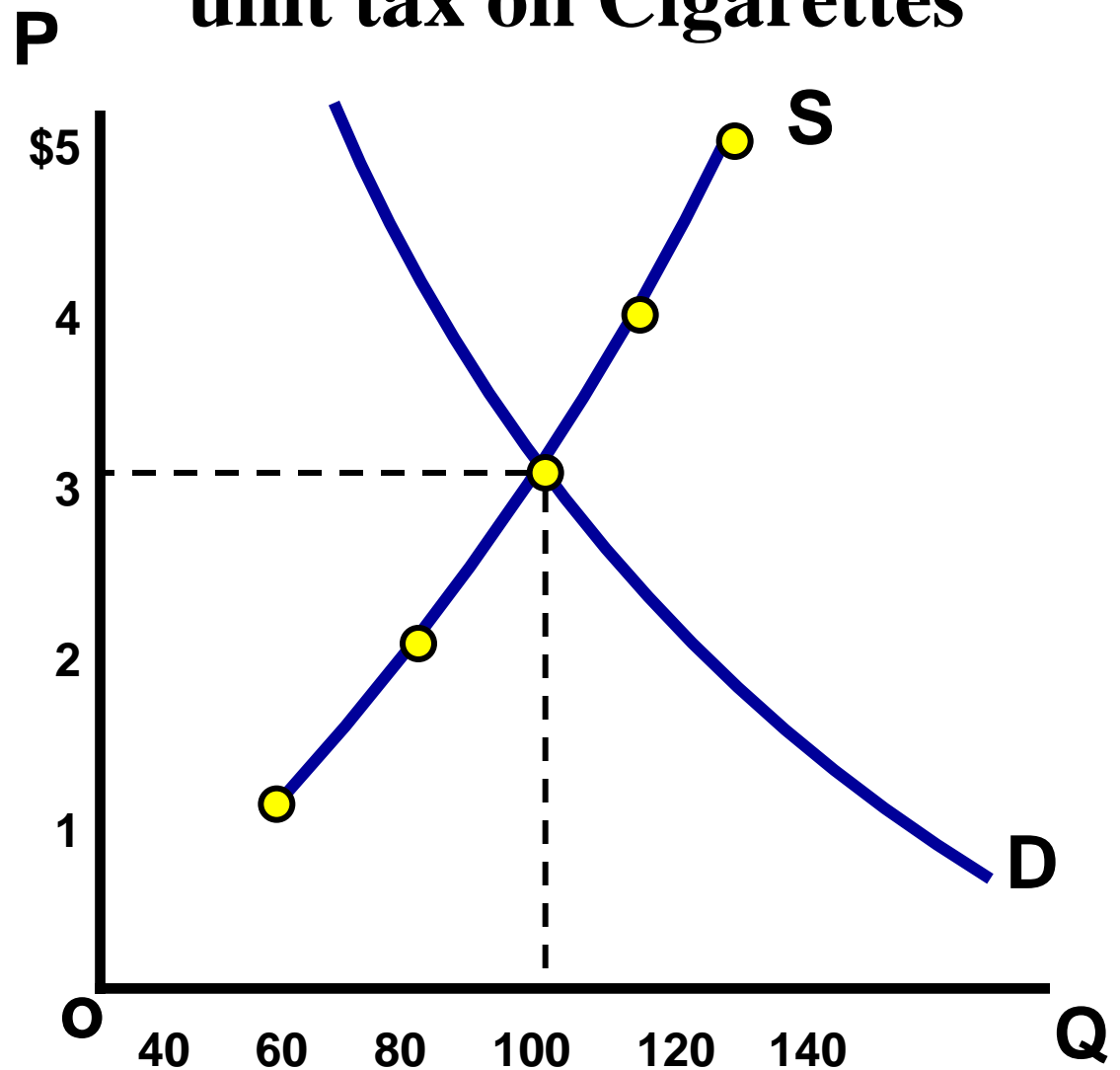
- **Cigarettes “sin tax”**
- **Alcohol “sin tax”**
- **Tariffs on imported goods**
- **Environmentally Unsafe Products**
- **Etc.**

Excise Taxes

Supply Schedule

P	Qs
\$5	140
\$4	120
\$3	100
\$2	80
\$1	60

Government sets a \$2 per unit tax on Cigarettes

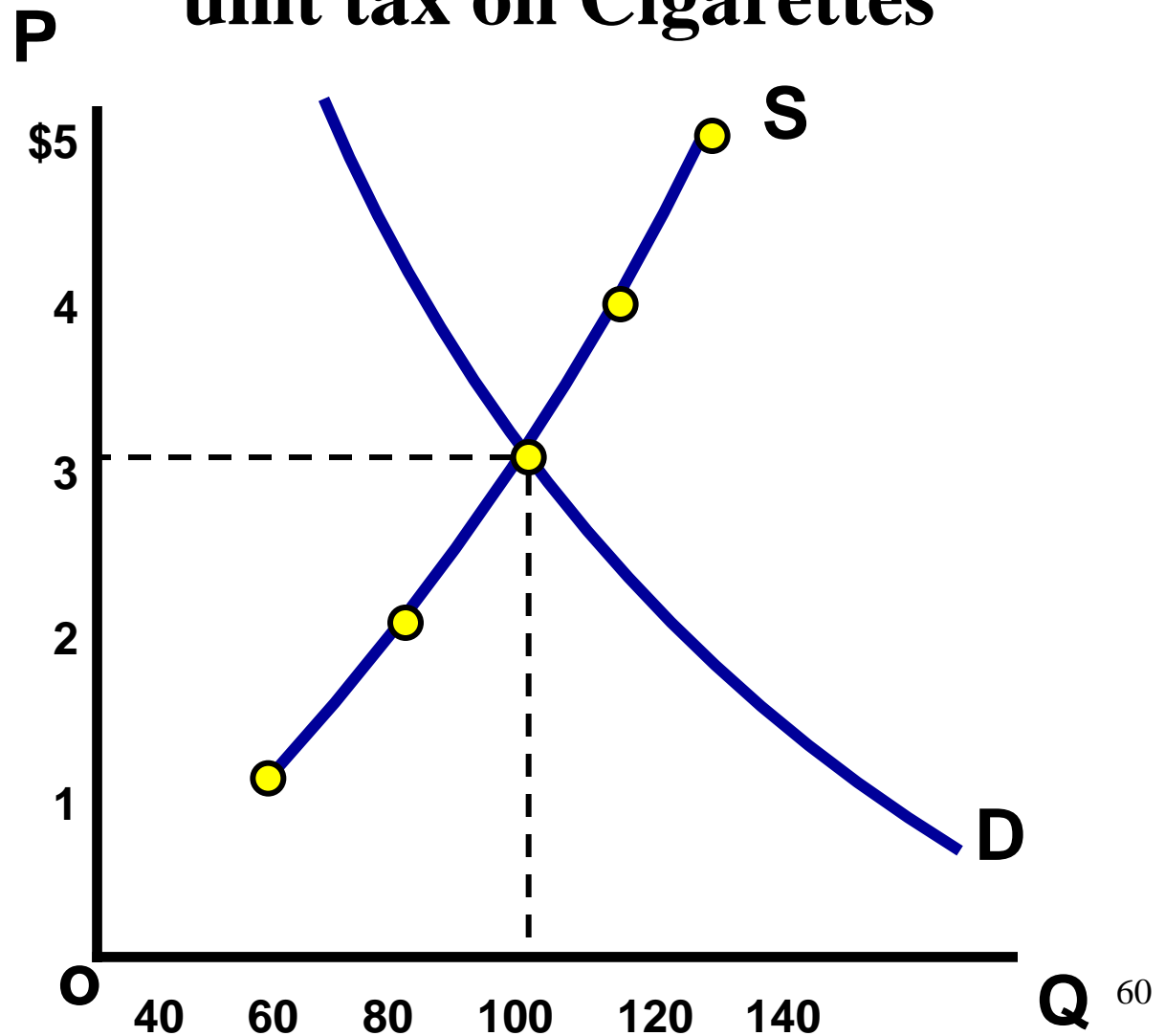


Excise Taxes

Supply Schedule

P	Qs
\$5 \$7	140
\$4 \$6	120
\$3 \$5	100
\$2 \$4	80
\$1 \$3	60

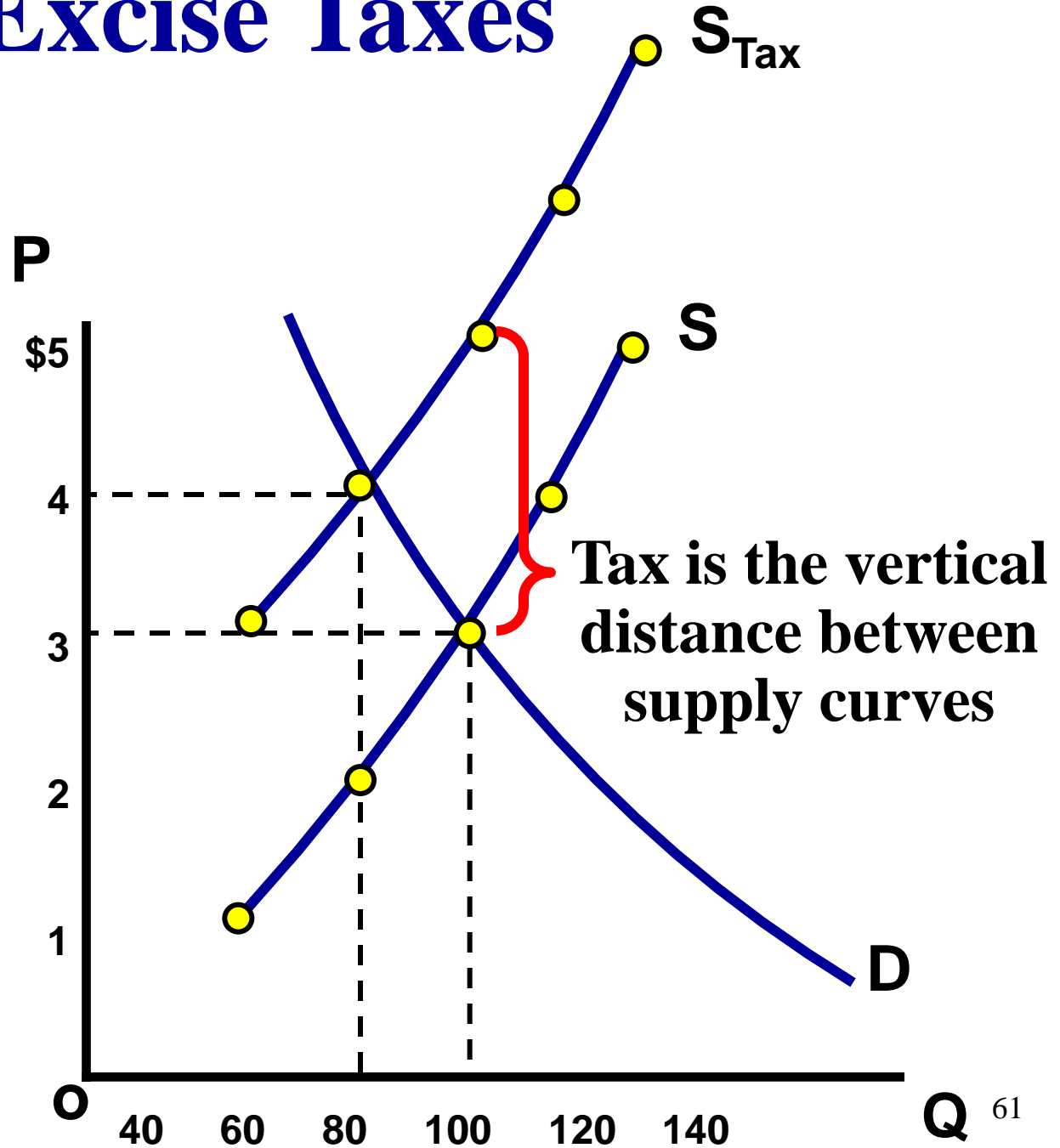
Government sets a \$2 per unit tax on Cigarettes



Excise Taxes

Supply Schedule

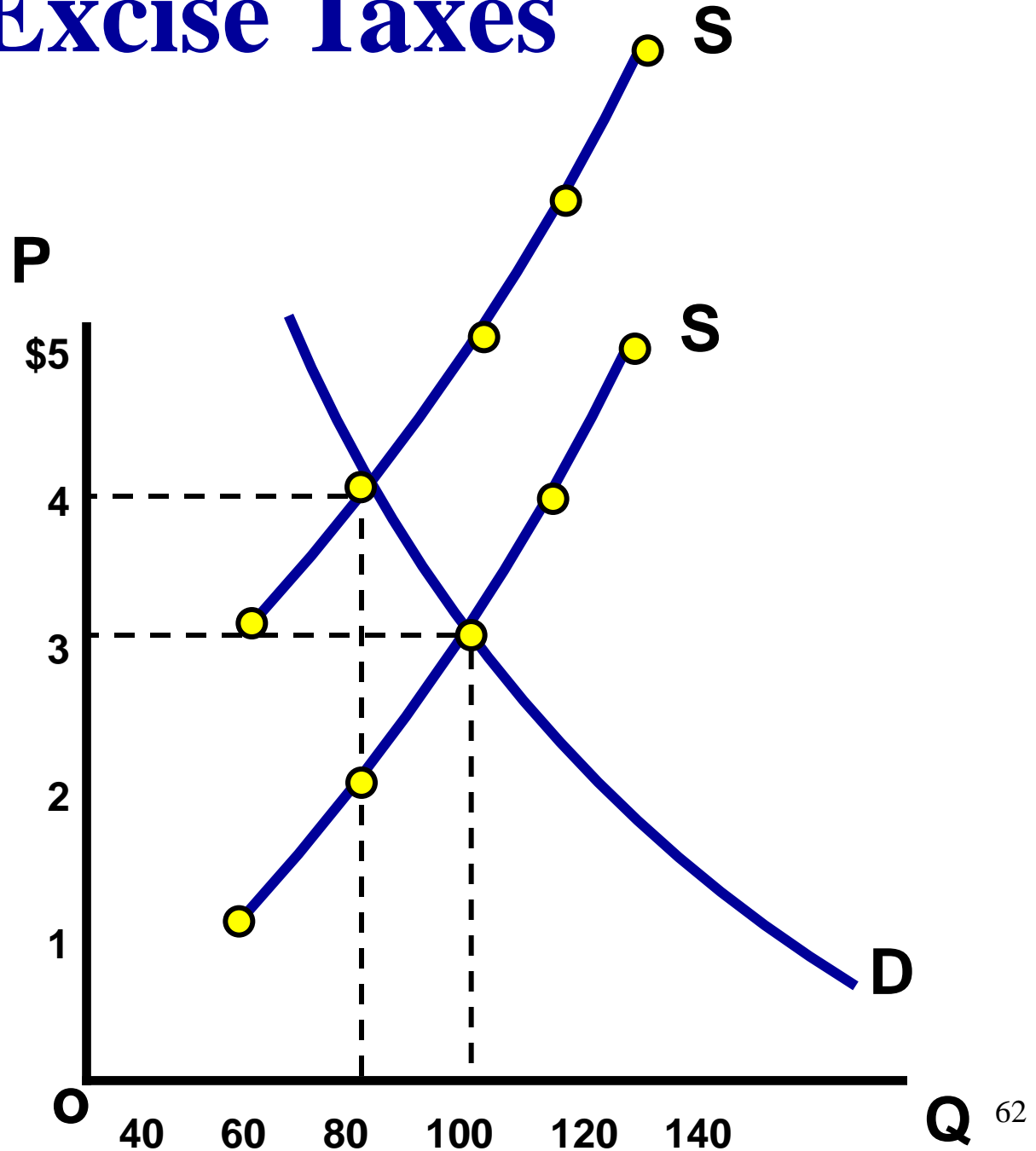
P	Qs
\$5 \$7	140
\$4 \$6	120
\$3 \$5	100
\$2 \$4	80
\$1 \$3	60



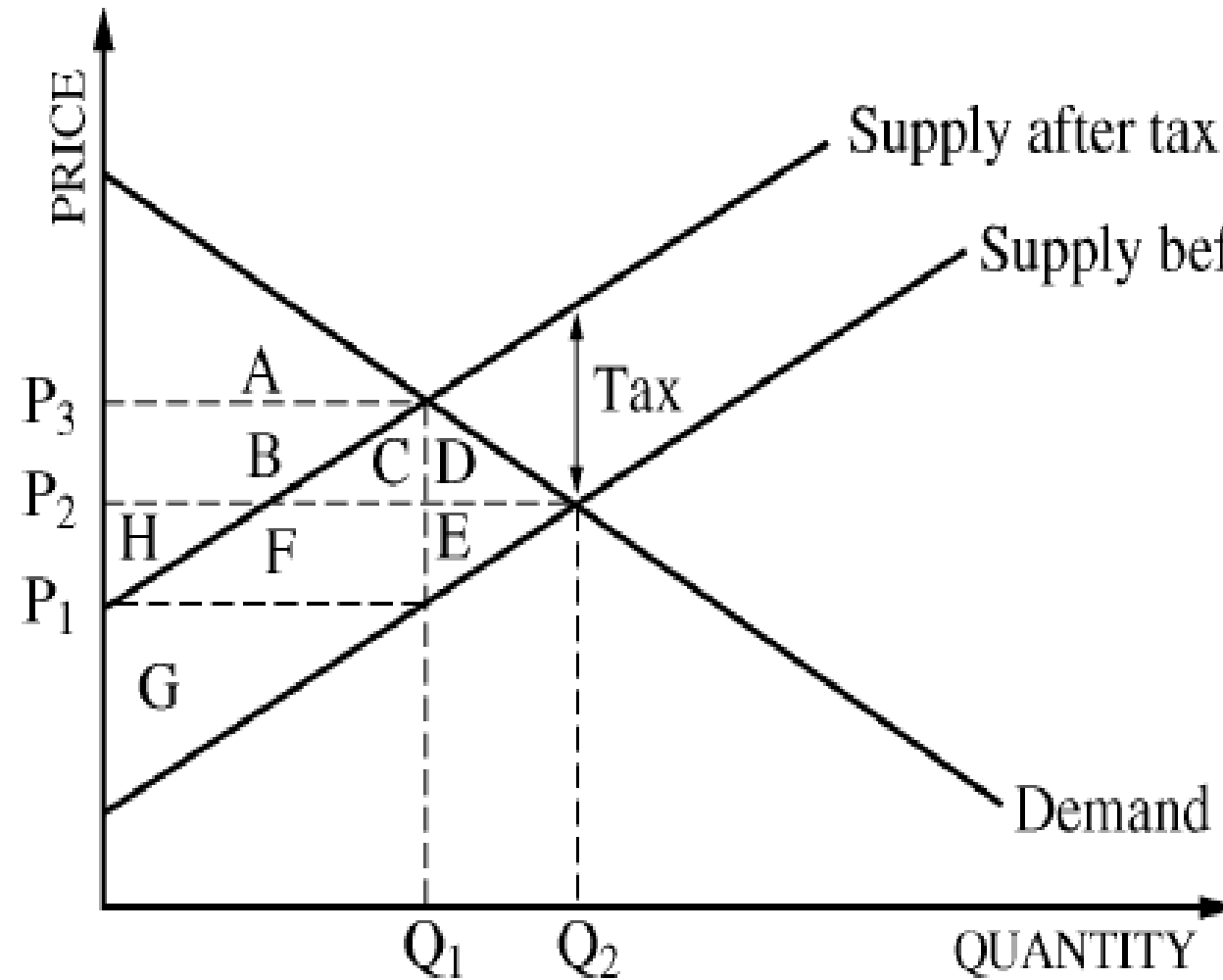
Excise Taxes

Identify the following:

1. Price before tax
2. Price consumers pay after tax
3. Price producers get after tax
4. Total tax revenue for the government before tax
5. Total tax revenue for the government after tax



Tax Practice



- 1. CS Before Tax**
- 2. PS Before Tax**
- 3. CS After Tax**
- 4. PS After Tax**
- 5. Tax Revenue for Government**
- 6. Dead Weight Loss due to tax**
- 7. Amount of tax revenue producers pay**

4 Types of Elasticity

- 1. Elasticity of Demand**
- 2. Elasticity of Supply**
- 3. Cross-Price Elasticity (Subs vs. Comp)**
- 4. Income Elasticity (Norm or Infer)**

1. Elasticity of Demand

Elasticity of Demand-

- **Measurement of consumers responsiveness to a change in price.**
- **What will happen if price increase? How much will it effect Quantity Demanded**

Who cares?

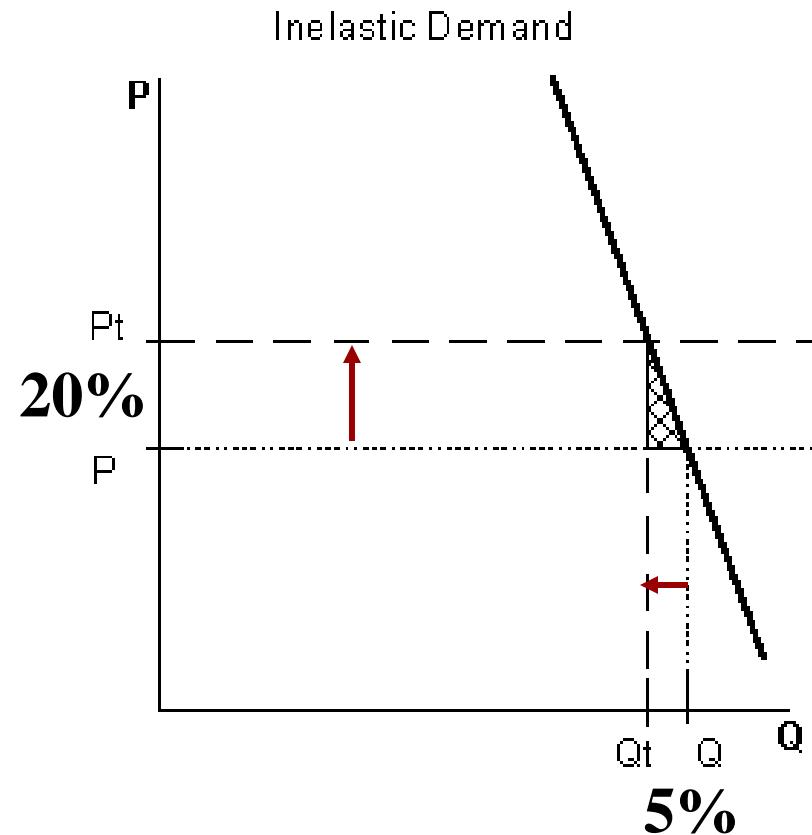
- **Used by firms to help determine prices and sales**
- **Used by the government to decide how to tax**

Inelastic Demand

Inelastic = Insensitive to a change in price.

- If price increases, quantity demanded will fall a little
- If price decreases, quantity demanded increases a little.

In other words, people will continue to buy it.



A INELASTIC demand curve is steep! (looks like an “I”)

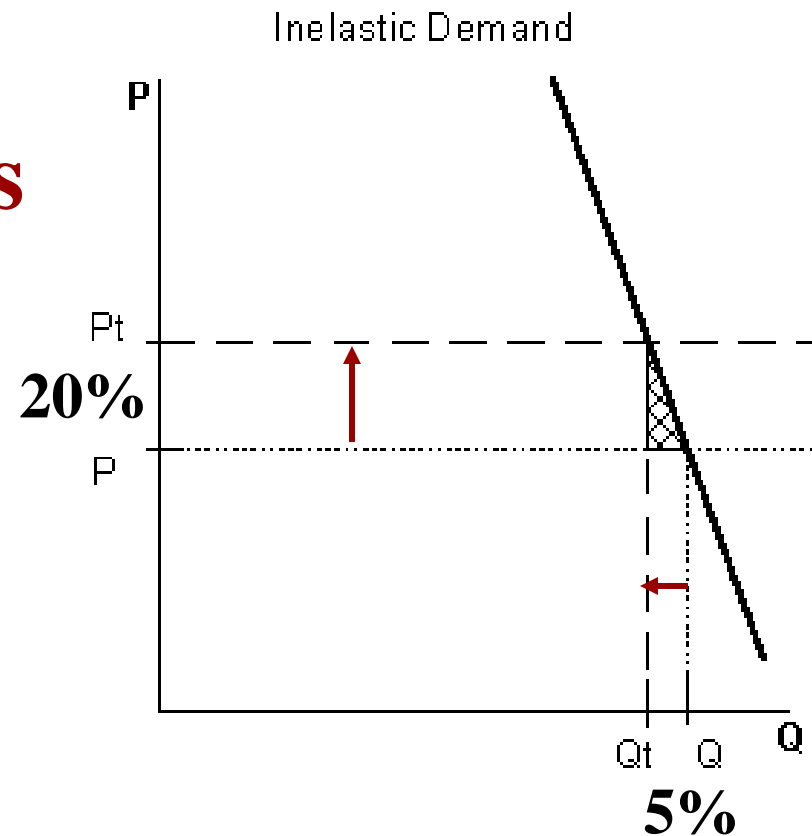
Examples:

- Gasoline
- Milk
- Diapers
- Chewing Gum
- Medical Care
- Toilet paper

Inelastic Demand

General Characteristics of INelastic Goods:

- Few Substitutes
- Necessities
- Small portion of income
- Required now, rather than later
- Elasticity coefficient less than 1



$$\frac{\% \Delta \text{ in quantity}}{\% \Delta \text{ in price}}$$

Elastic Demand

Elastic = Sensitive to a change in price.

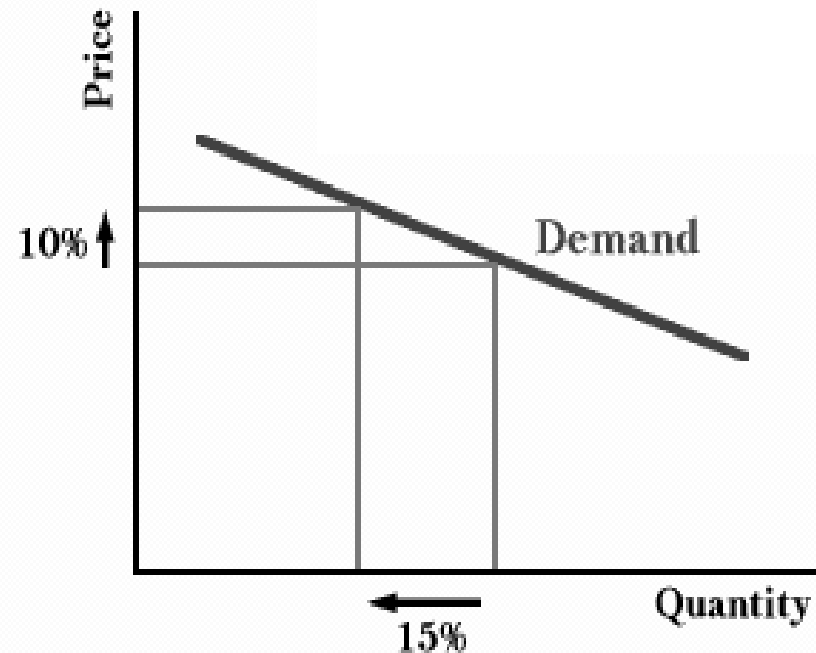
- If price increases, quantity demanded will fall a lot
- If price decreases, quantity demanded increases a lot.

In other words, the amount people buy is sensitive to price.

An ELASTIC demand curve is flat!

Examples:

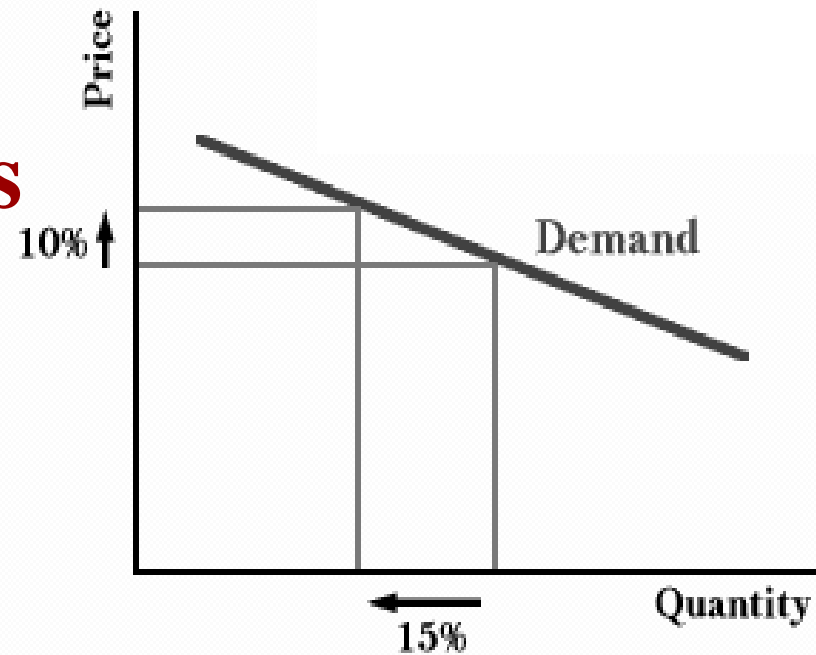
- Soda
- Boats
- Beef
- Real Estate
- Pizza
- Gold



Elastic Demand

General Characteristics of Elastic Goods:

- Many Substitutes
- Luxuries
- Large portion of income
- Plenty of time to decide
- Elasticity coefficient greater than 1



$$\frac{\% \Delta \text{ in quantity}}{\% \Delta \text{ in price}}$$

Elastic or Inelastic?

Beef- Elastic- 1.27

Gasoline- INelastic - .20

Real Estate- Elastic- 1.60

Medical Care- INelastic - .31

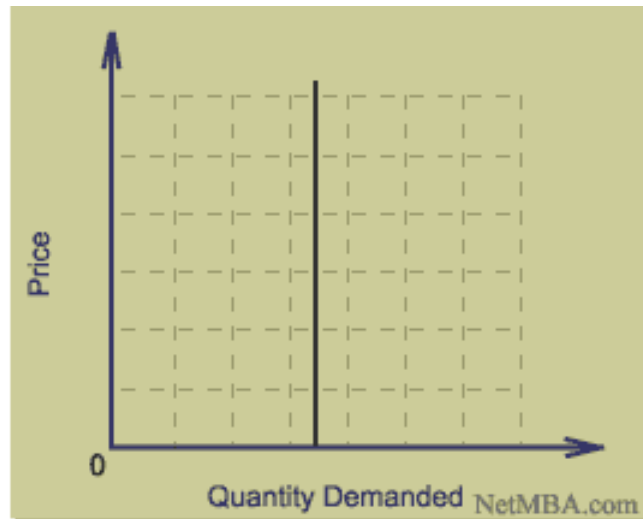
Electricity- INelastic - .13

Gold- Elastic - 2.6

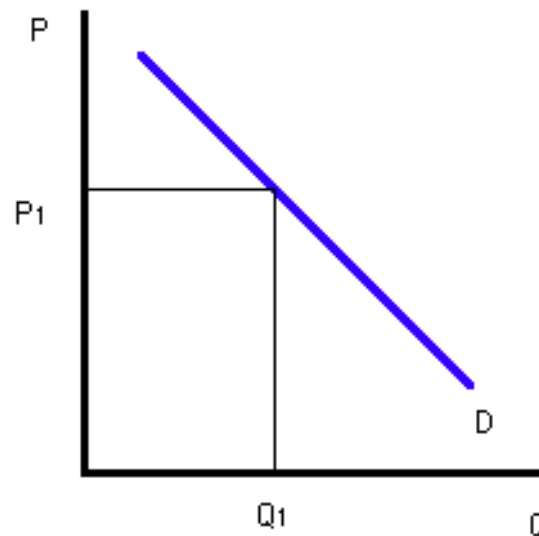
What about the demand for insulin for diabetics?

What if % change in quantity demanded equals % change in price?

**Perfectly INELASTIC
(Coefficient = 0)**



**Unit Elastic (Coefficient =1)
45 Degrees**



Total Revenue Test

Uses elasticity to show how changes in price will affect total revenue (TR).

$$(TR = Price \times Quantity)$$



Elastic Demand-

- Price increase causes TR to decrease
- Price decrease causes TR to increase

Inelastic Demand-

- Price increase causes TR to increase
- Price decrease causes TR to decrease

Unit Elastic-

- Price changes and TR remains unchanged

Ex: If demand for milk is INelastic, what will happen to expenditures on milk if price increases?

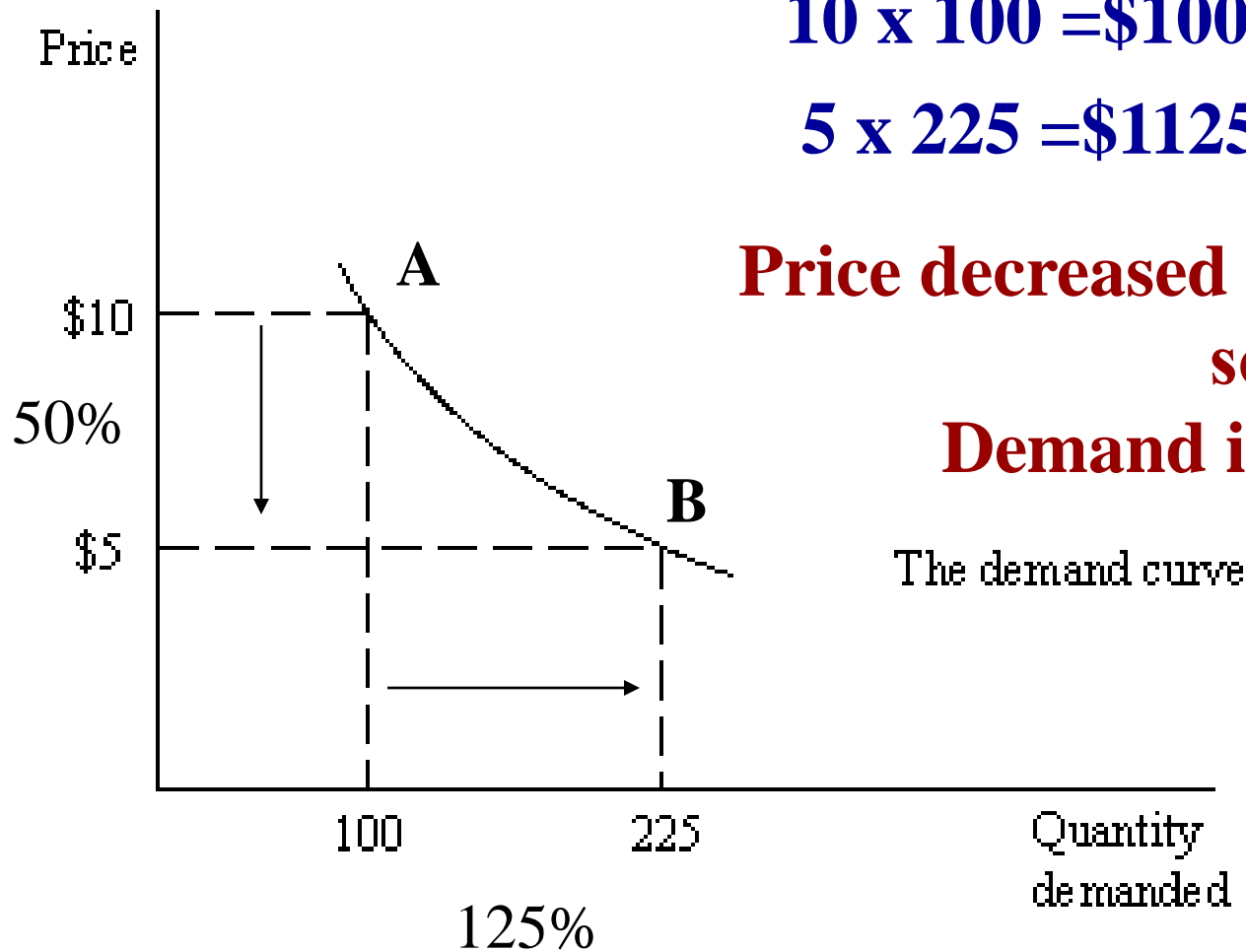
Is the range between A and B, elastic, inelastic, or unit elastic?

$10 \times 100 = \$1000$ Total Revenue

$5 \times 225 = \$1125$ Total Revenue

Price decreased and TR increased,
so...

Demand is ELASTIC



$$\frac{\% \Delta \text{ in quantity}}{\% \Delta \text{ in price}}$$

2. Price Elasticity of Supply

Elasticity of Supply-

- Elasticity of supply shows how **sensitive producers** are to a change in price.

Elasticity of supply is based on time limitations.

Producers need time to produce more.

$$\frac{\% \Delta \text{in quantity}}{\% \Delta \text{in price}}$$

INelastic = Insensitive to a change in price (Steep curve)

- **Most goods have INelastic supply in the short-run**

Elastic = Sensitive to a change in price (Flat curve)

- **Most goods have elastic supply in the long-run**

Perfectly Inelastic = Q doesn't change (Vertical line)

- **Set quantity supplied**

3. Cross-Price Elasticity of Demand

- Cross-Price elasticity shows how **sensitive** a product is to a change in price of another good
- It shows if two goods are substitutes or compliments

$$\frac{\% \text{ change in quantity of product "b"}}{\% \text{ change in price of product "a"}}$$

P increases 20%



Q decreases 15%

- If coefficient is negative (shows inverse relationship) than the goods are **complements**
- If coefficient is positive (shows direct relationship) than the goods are **substitutes**

4. Income-Elasticity of Demand

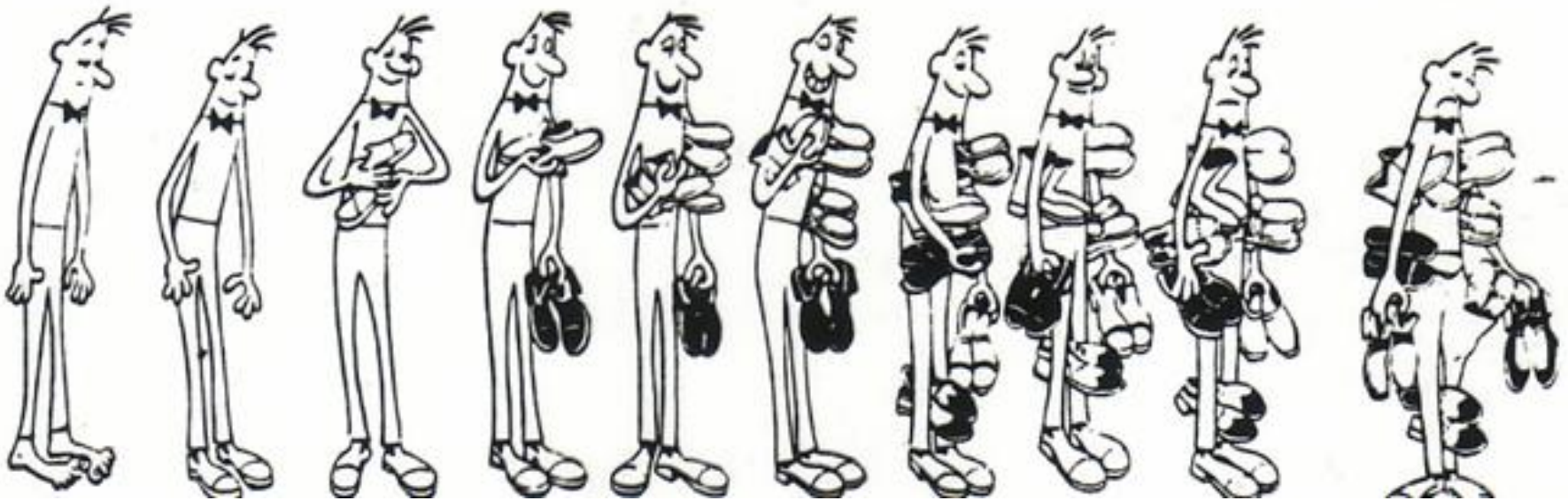
- Income elasticity shows how sensitive a product is to a change in **INCOME**
- It shows if goods are normal or inferior
$$\frac{\% \text{ change in quantity}}{\% \text{ change in income}}$$

**Income increases 20%, and quantity decreases 15%
then the good is a... INFERIOR GOOD**

- If coefficient is negative (shows inverse relationship) than the good is **inferior**
- If coefficient is positive (shows direct relationship) than the good is **normal**

Ex: If income falls 10% and quantity falls 20%...

Consumer Choice and Utility Maximization



Calculate Marginal Utility

# of Slices of Pizza	Total Utility (in dollars)	Marginal Utility/Benefit
0	0	
1	8	
2	14	
3	19	
4	23	
5	25	
6	26	
7	26	
8	24	

How many pizzas would you buy if the price per slice was \$2?

Calculate Marginal Utility

# of Slices of Pizza	Total Utility (in dollars)	Marginal Utility/Benefit	Marginal Cost
0	0	0	\$2
1	8	8	\$2
2	14	6	\$2
3	19	5	\$2
4	23	4	\$2
5	25	2	\$2
6	26	1	\$2
7	26	0	\$2
8	24	-2	\$2

How many pizzas would you buy if the price per slice was \$2?

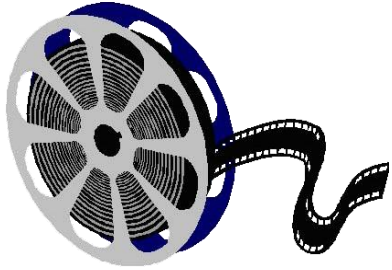
Calculate Marginal Utility

# of Slices of Pizza	Total Utility (in cents)	Marginal Utility (in cents)	Marginal Benefit (in cents)	Marginal Cost (in cents)
0	0			2
1	10	10	10	2
2	18	8	8	2
3	24	6	6	2
4	28	4	4	2
5	30	2	2	2
6	30	0	0	2
7	28	-2	-2	2
8	24	-4	-4	2

You will continue to consume until
Marginal Benefit =
Marginal Cost

How many pizzas would you buy if the price per slice was \$2?

\$10



Utility Maximization

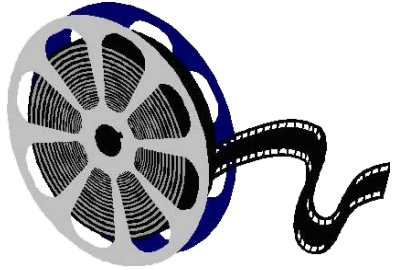
\$5



# Times Going	Marginal Utility (Movies)	MU/P (Price = \$10)	Marginal Utility (Go Carts)	MU/P (Price = \$5)
1st	30		10	
2nd	20		5	
3rd	10		2	
4th	5		1	

If you only have \$25, what combination of movies and go carts maximizes your utility?

\$10



Utility Maximization

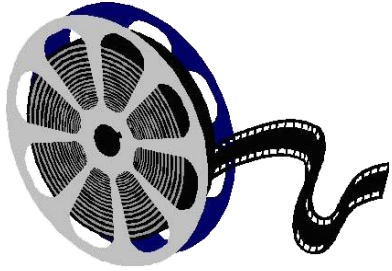
\$5



# Times Going	Marginal Utility (Movies)	MU/P (Price = \$10)	Marginal Utility (Go Carts)	MU/P (Price = \$5)
1st	30	\$3	10	
2nd	20		5	
3rd	10		2	
4th	5		1	

If you only have \$25, what combination of movies and go carts maximizes your utility?

\$10



Utility Maximization

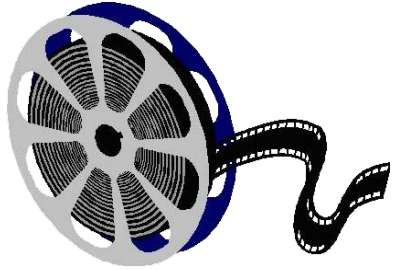
\$5



# Times Going	Marginal Utility (Movies)	MU/P (Price = \$10)	Marginal Utility (Go Carts)	MU/P (Price = \$5)
1st	30	\$3	10	\$2
2nd	20		5	
3rd	10		2	
4th	5		1	

If you only have \$25, what combination of movies and go carts maximizes your utility?

\$10



Utility Maximization

\$5



# Times Going	Marginal Utility (Movies)	MU/P (Price =\$10)	Marginal Utility (Go Carts)	MU/P (Price =\$5)
1st	30	\$3	10	\$2
2nd	20	\$2	5	\$1
3rd	10	\$1	2	\$.40
4th	5	\$.50	1	\$.20

If you only have \$25, what combination of movies and go carts maximizes your utility?

Utility Maximizing Rule

The consumer's money should be spent so that the marginal utility per dollar of each goods equal each other.

$$\frac{\text{MU}_x}{P_x} = \frac{\text{MU}_y}{P_y}$$

Apples

Oranges

<u>Quantity</u>	<u>Total utility</u>	<u>Quantity</u>	<u>Total utility</u>
0	0	0	0
1	20	1	30
2	35	2	50
3	45	3	65
4	50	4	75
5	52	5	80

Assume apples cost \$1 each and oranges cost \$2 each. If the consumer has \$7, identify the combination that maximizes utility.