

# SUPPLY AND DEMAND : HOW MARKETS WORK

## Chapter 4 : The Market Forces of Supply and Demand

- Supply and demand are the two words that economists use most often.
- Supply and demand are the forces that make market economies work.
- Modern microeconomics is about supply, demand, and market equilibrium.

### MARKETS AND COMPETITION

A *market* is a group of buyers and sellers of a particular good or service.

- The terms supply and demand refer to the behavior of people . . . as they interact with one another in markets.

Buyers determine *demand*

Sellers determine *supply*

### Competitive Markets

- A *competitive market* is a market in which there are many buyers and sellers so that each has a negligible impact on the market price.
- Perfect Competition
  - Products are the same
  - Numerous buyers and sellers so that each has no influence over price
  - Buyers and Sellers are price takers
- Monopoly
  - One seller, and seller controls price
- Oligopoly
  - Few sellers
  - Not always aggressive competition
- Monopolistic Competition
  - Many sellers
  - Slightly differentiated products
  - Each seller may set price for its own product

### DEMAND

- Quantity demanded* is the amount of a good that buyers are willing and able to purchase.

Law of Demand

- The *law of demand* states that, other things equal, the quantity demanded of a good falls when the price of the good rises.

### The Demand Curve: The Relationship between Price and Quantity Demanded

- Demand Schedule
- The *demand schedule* is a table that shows the relationship between the price of the good and the quantity demanded.

## Catherine's Demand Schedule

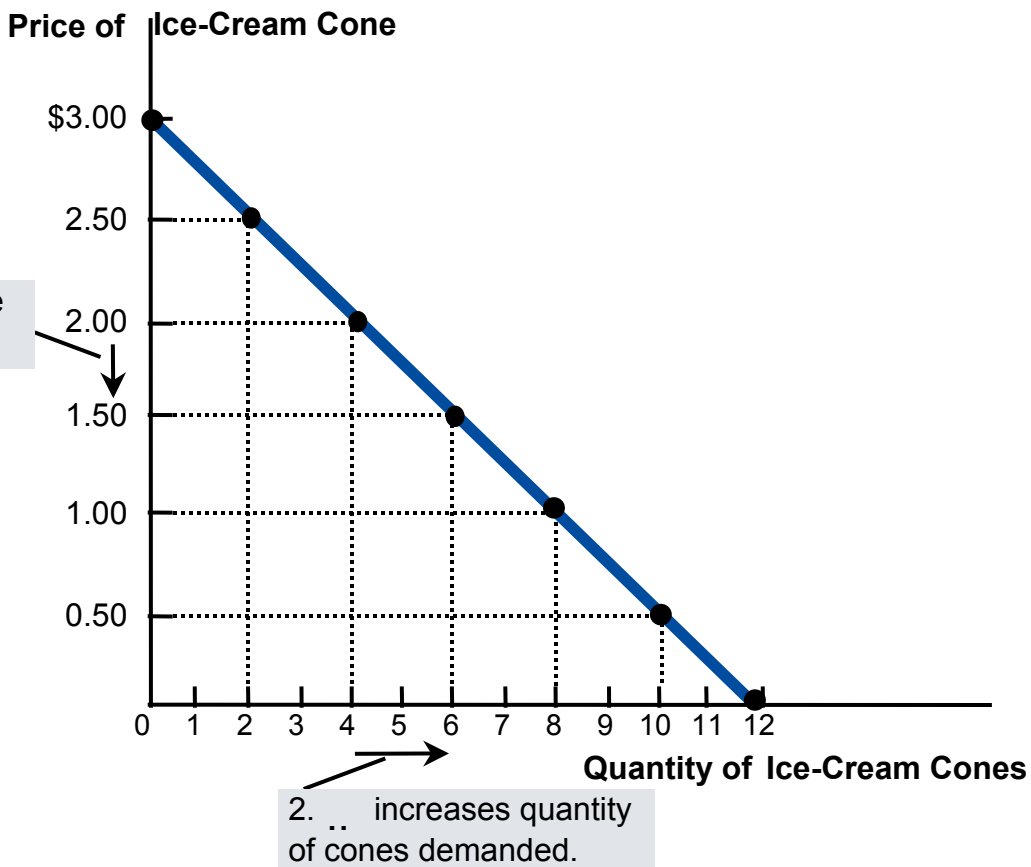
Price of Ice-Cream Cone	Quantity of Cones Demanded
\$0.00	12
0.50	10
1.00	8
1.50	6
2.00	4
2.50	2
3.00	0

## The Demand Curve: The Relationship between Price and Quantity Demanded

- Demand Curve
- The *demand curve* is a graph of the relationship between the price of a good and the quantity demanded.

## Market Demand versus Individual Demand

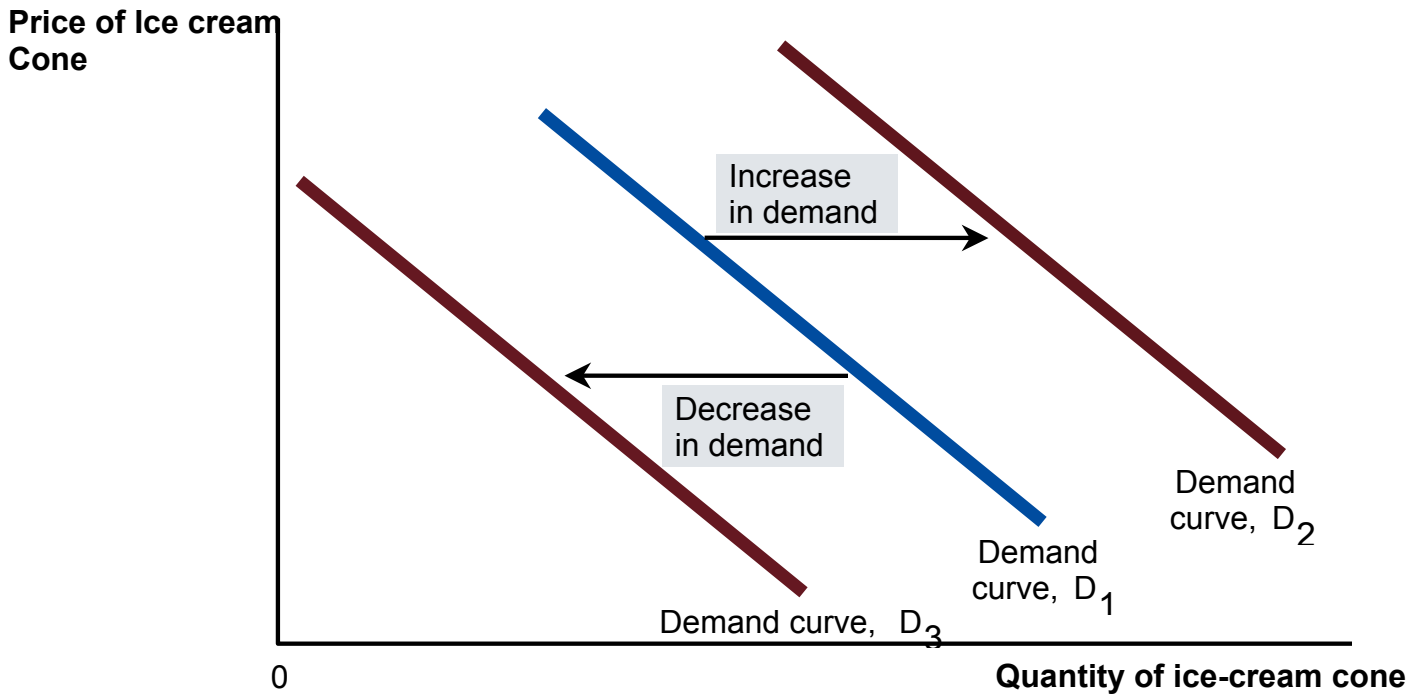
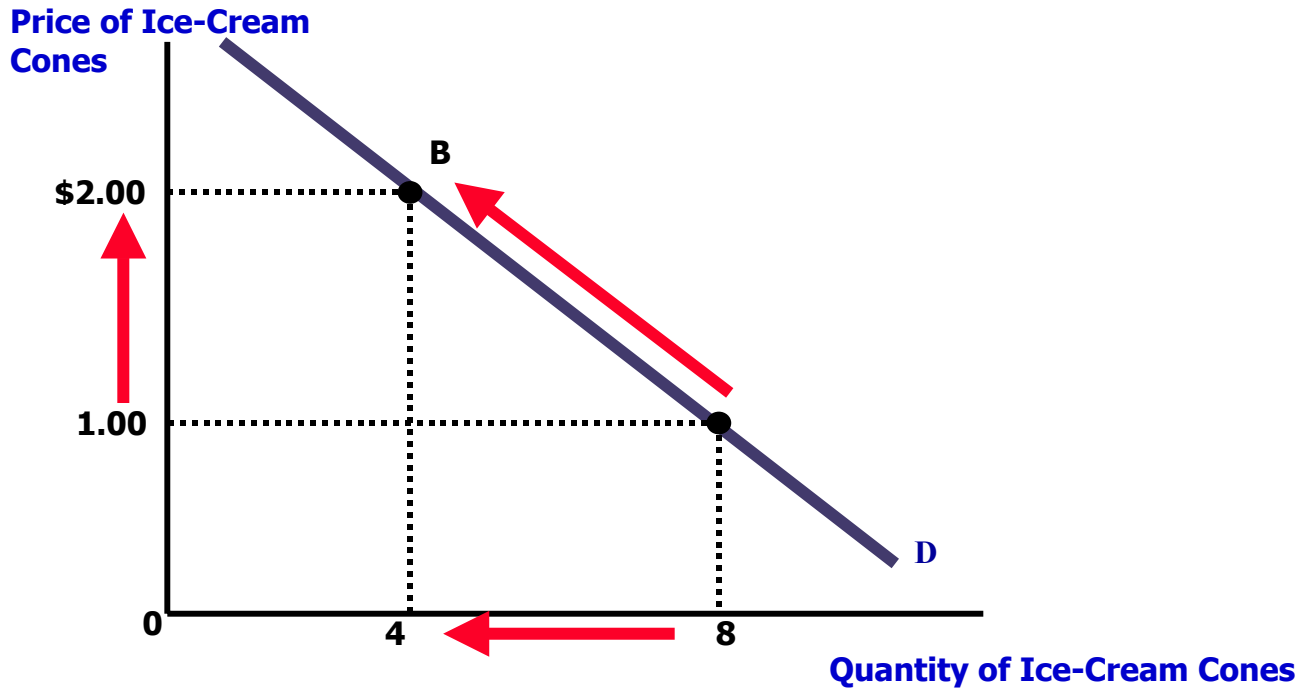
- Market demand refers to the sum of all individual demands for a particular good or service.
- Graphically, individual demand curves are summed horizontally to obtain the market demand curve.



### Shifts in the Demand Curve

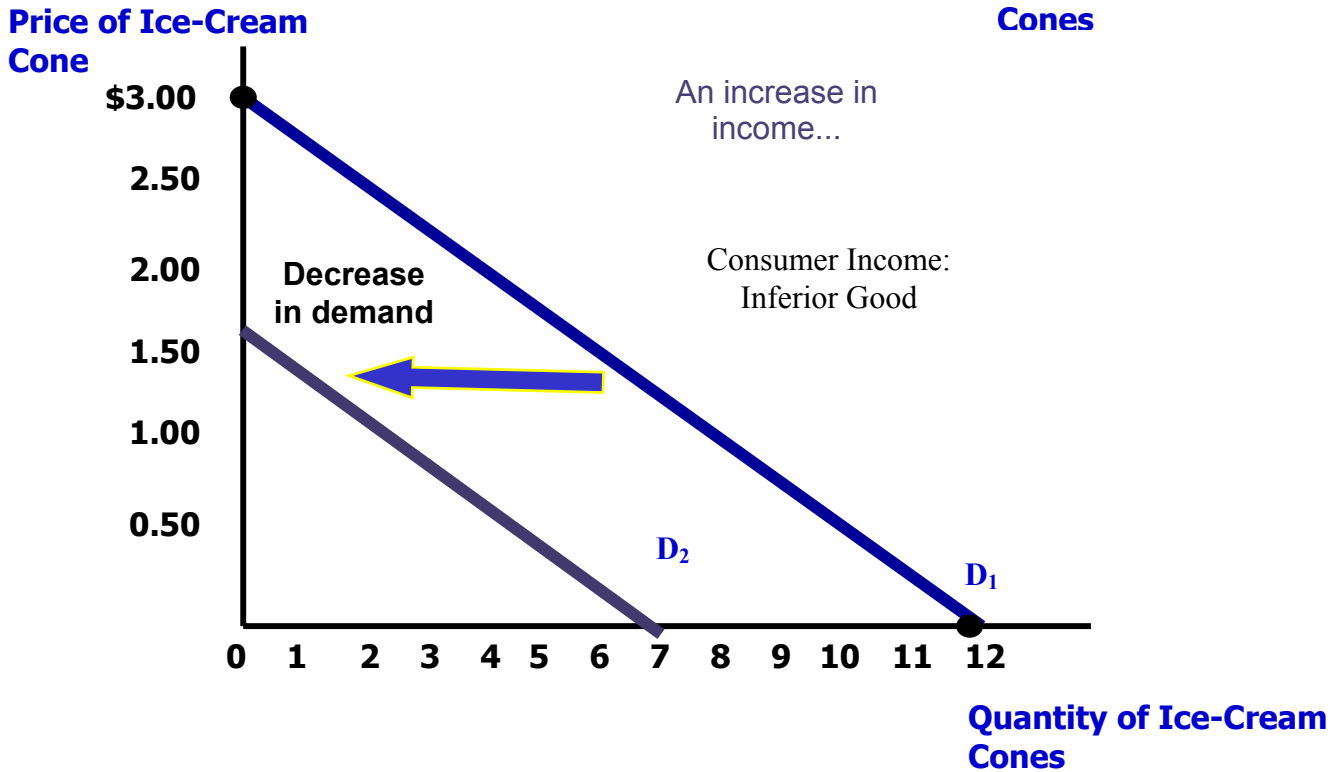
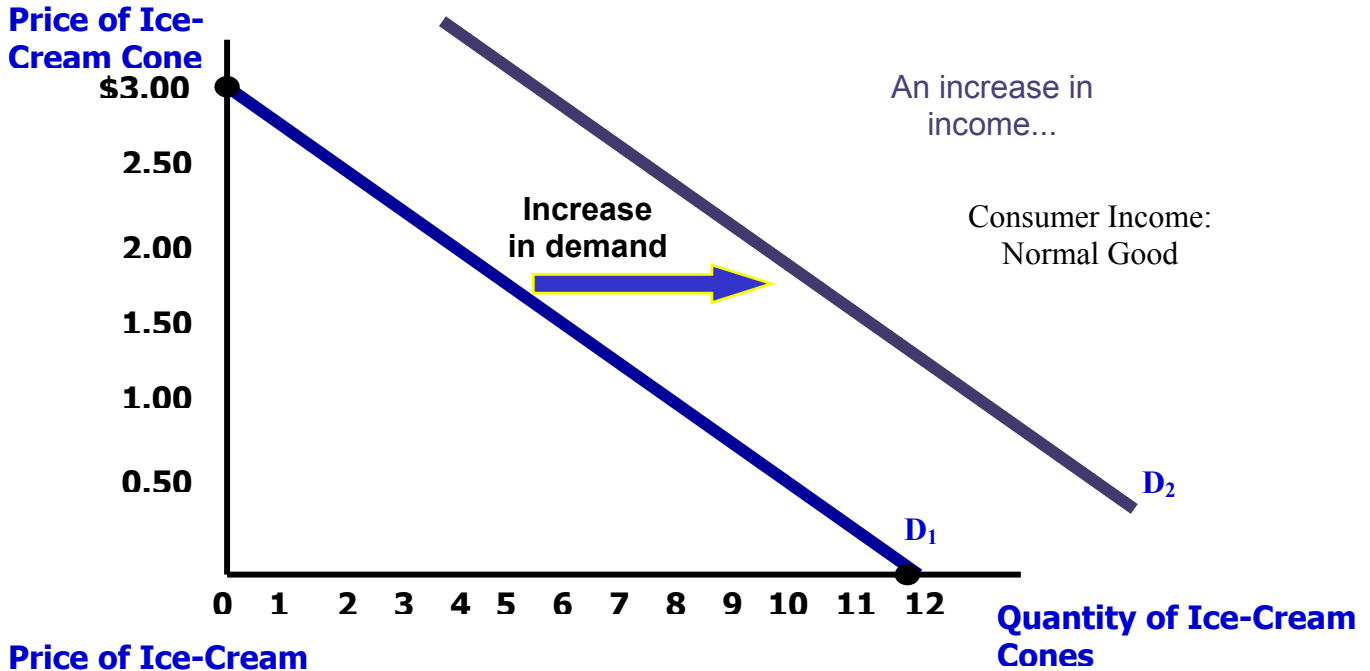
- Change in Quantity Demanded
- Movement along the demand curve.
- Caused by a change in the price of the product.

### Changes in Quantity Demanded



### Shifts in the Demand Curve

- Consumer income
- Prices of related goods
- Tastes
- Expectations
- Number of buyers



### •Change in Demand

- A shift in the demand curve, either to the left or right.
- Caused by any change that alters the quantity demanded at every price.
- Consumer Income
- As income increases the demand for a *normal good* will increase.
- As income increases the demand for an *inferior good* will decrease.

### •Prices of Related Goods

- When a fall in the price of one good reduces the demand for another good, the two goods are called *substitutes*.
- When a fall in the price of one good increases the demand for another good, the two goods are called *complements*.

**Table 1 Variables That Influence Buyers**

Variable	A Change in This Variable . . .
Price	Represents a movement along the demand curve
Income	Shifts the demand curve
Prices of related goods	Shifts the demand curve
Tastes	Shifts the demand curve
Expectations	Shifts the demand curve
Number of buyers	Shifts the demand curve

## SUPPLY

- Quantity supplied* is the amount of a good that sellers are willing and able to sell.
- Law of Supply
- The *law of supply* states that, other things equal, the quantity supplied of a good rises when the price of the good rises.

### The Supply Curve: The Relationship between Price and Quantity Supplied

- Supply Schedule
  - The *supply schedule* is a table that shows the relationship between the price of the good and the quantity supplied.
- Ben's Supply Schedule

Price of Ice-Cream Cone	Quantity of Cones Demanded
\$0.00	0
0.50	0
1.00	1
1.50	2
2.00	3
2.50	4
3.00	5

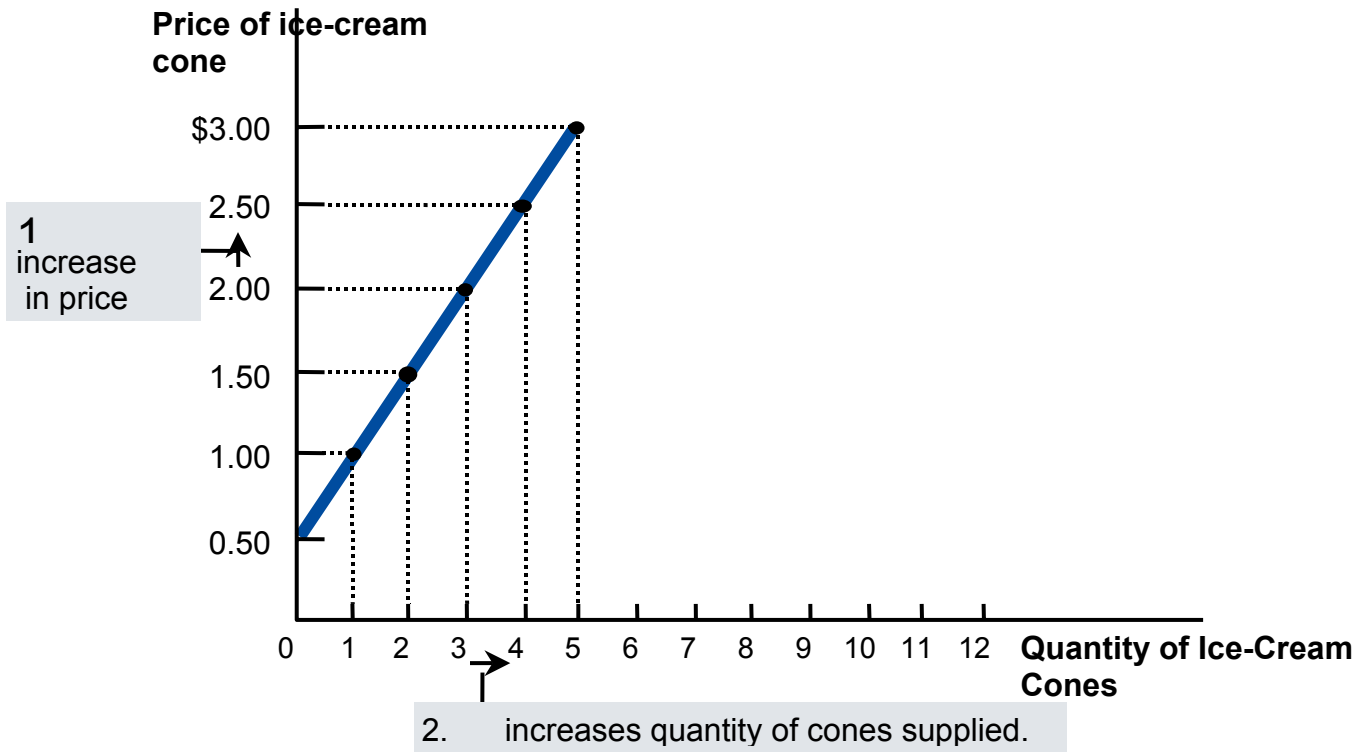
- Supply Curve
- The *supply curve* is the graph of the relationship between the price of a good and the quantity supplied.

### Market Supply versus Individual Supply

- Market supply refers to the sum of all individual supplies for all sellers of a particular good or service.
- Graphically, individual supply curves are summed horizontally to obtain the market supply curve.

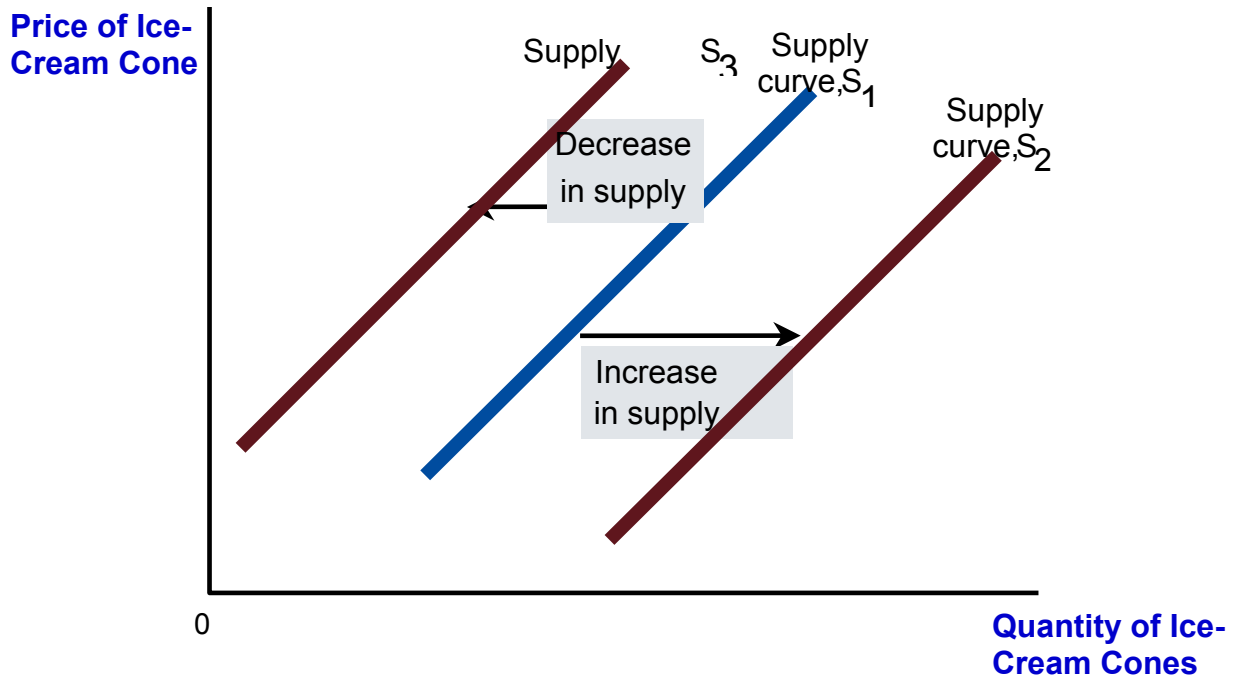
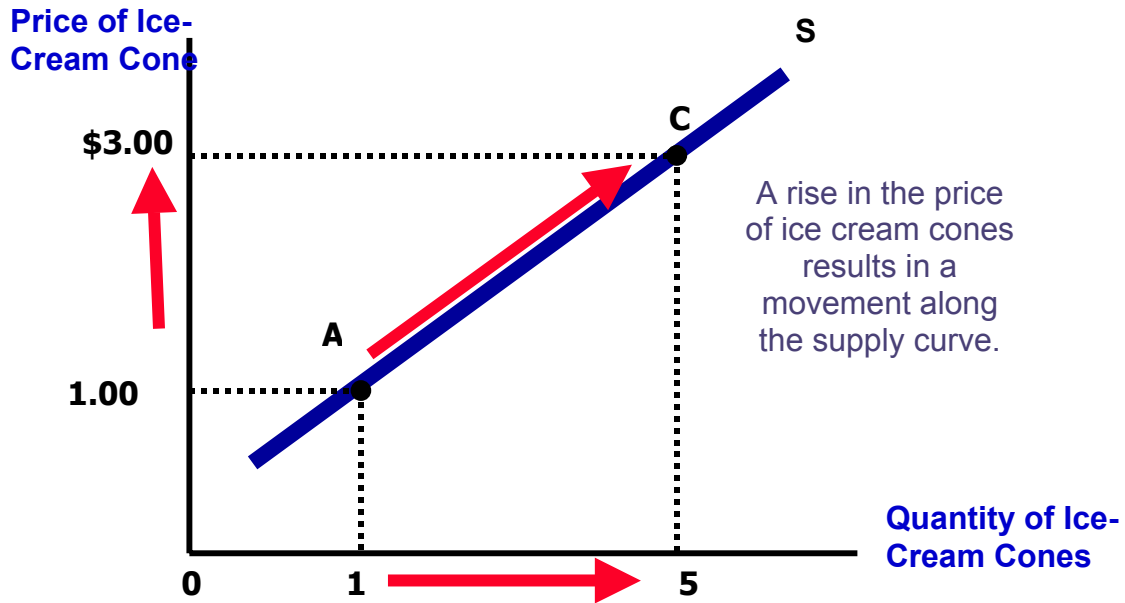
### Shifts in the Supply Curve

- Input prices
- Technology
- Expectations
- Number of sellers
- Change in Quantity Supplied
- Movement along the supply curve.
- Caused by a change in anything that alters the quantity supplied at each price.



### Change in Supply

- A shift in the supply curve, either to the left or right.
- Caused by a change in a determinant other than price.



**Table 2 Variables That Influence Sellers**

Variable	A Change in This Variable . . .
Price	Represents a movement along the supply curve
Input prices	Shifts the supply curve
Technology	Shifts the supply curve
Expectations	Shifts the supply curve
Number of sellers	Shifts the supply curve

## SUPPLY AND DEMAND TOGETHER

- *Equilibrium* refers to a situation in which the price has reached the level where quantity supplied equals quantity demanded.
- *Equilibrium Price*• The price that balances quantity supplied and quantity demanded.
- On a graph, it is the price at which the supply and demand curves intersect.
- *Equilibrium Quantity*• The quantity supplied and the quantity demanded at the equilibrium price.
- On a graph it is the quantity at which the supply and demand curves intersect.

## SUPPLY AND DEMAND TOGETHER

### Demand Schedule

Price of Ice-Cream Cone	Market
\$0.00	19
0.50	16
1.00	13
1.50	10
2.00	7
2.50	4
3.00	1

### Supply Schedule

Price of Ice-Cream Cone	Market
\$0.00	0
0.50	0
1.00	1
1.50	4
2.00	7
2.50	10
3.00	13

At \$2.00, the quantity demanded is equal to the quantity supplied

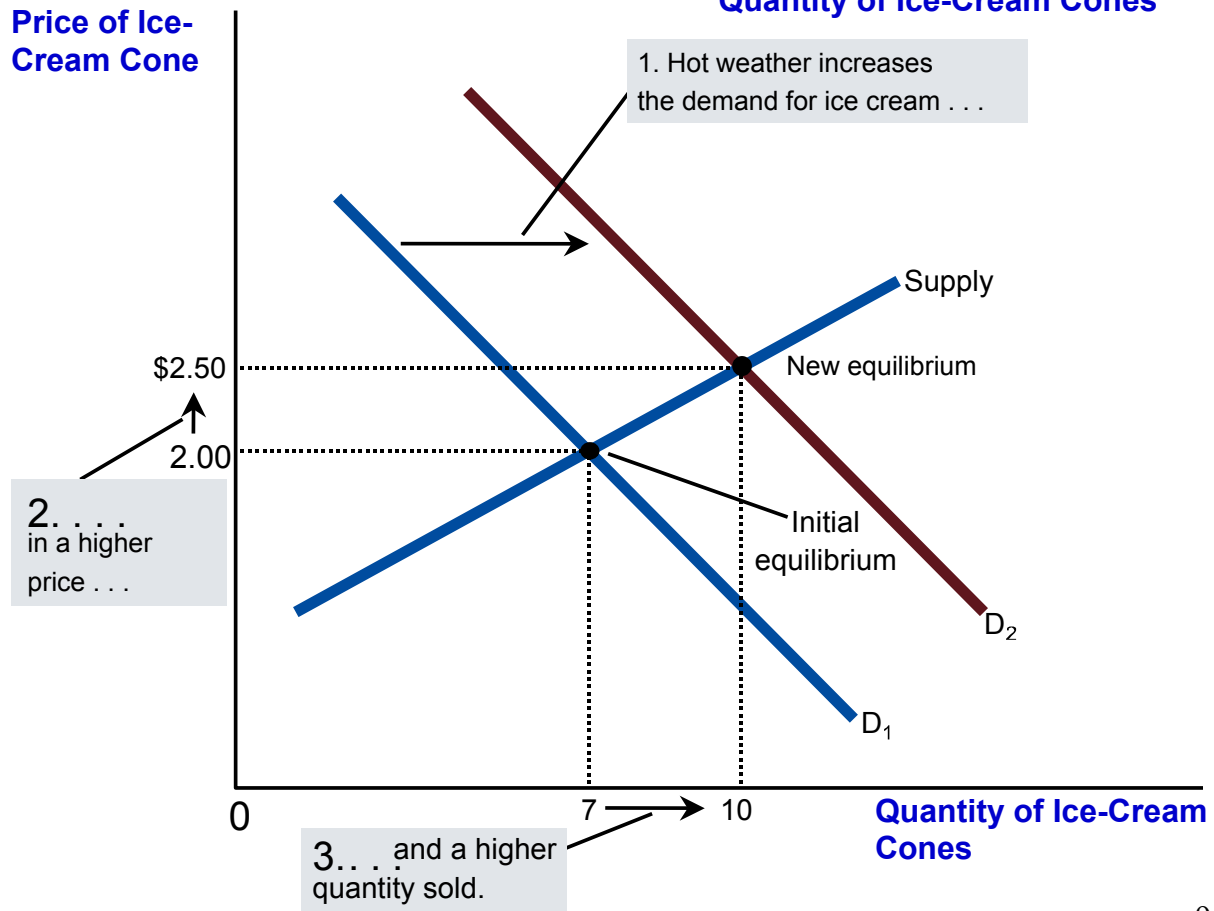
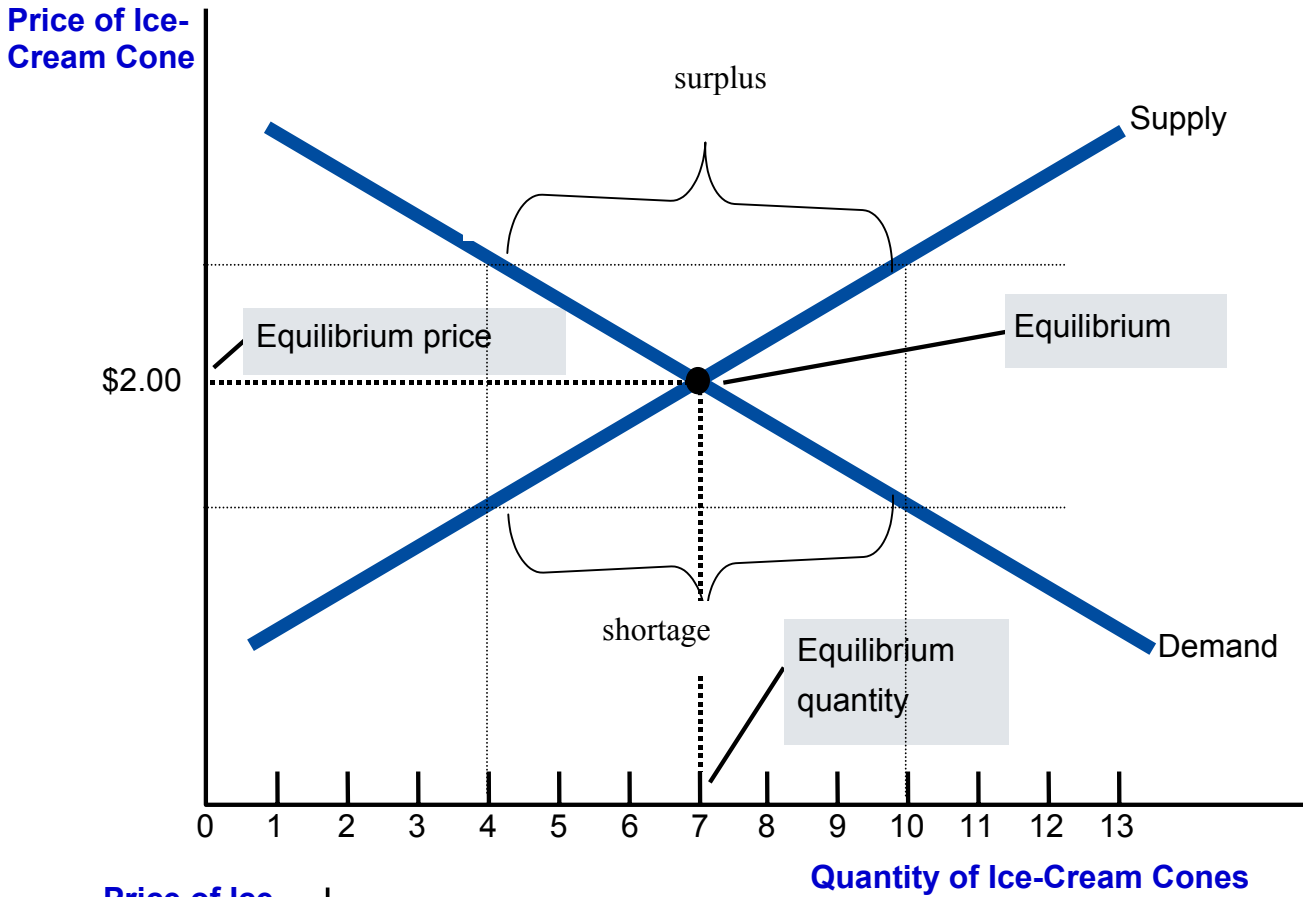
### Equilibrium

- *Surplus*• When price > equilibrium price, then quantity supplied > quantity demanded.
- There is excess supply or a surplus.
- Suppliers will lower the price to increase sales, thereby moving toward equilibrium.
- *Shortage*• When price < equilibrium price, then quantity demanded > the quantity supplied.
- There is excess demand or a shortage.
- Suppliers will raise the price due to too many buyers chasing too few goods, thereby moving toward equilibrium.
- *Law of supply and demand*• The claim that the price of any good adjusts to bring the quantity supplied and the quantity demanded for that good into balance.

### Three Steps to Analyzing Changes in Equilibrium

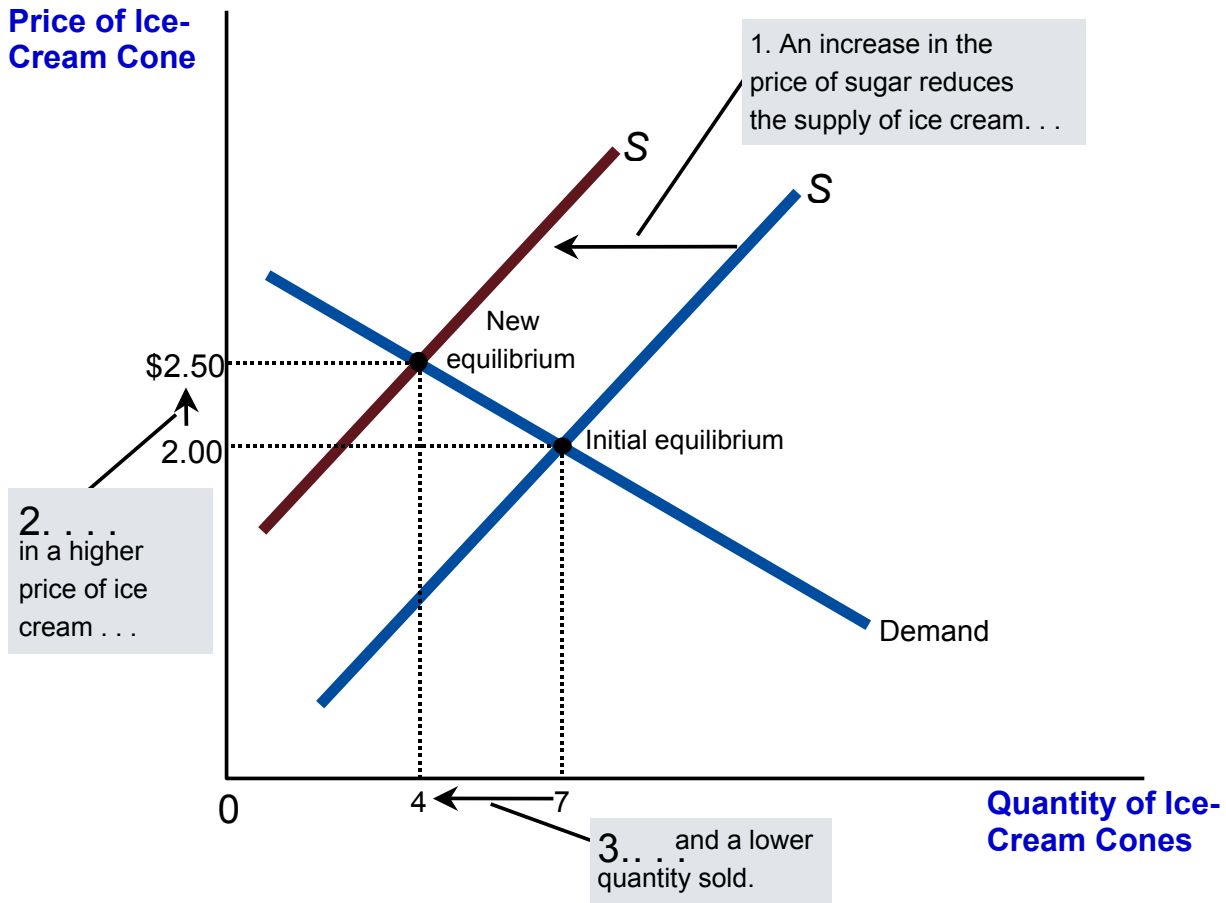
- Decide whether the event shifts the supply or demand curve (or both).
- Decide whether the curve(s) shift(s) to the left or to the right.
- Use the supply-and-demand diagram to see how the shift affects equilibrium price and quantity.





**•Shifts in Curves versus Movements along Curves**

- A shift in the supply curve is called a change in supply.
- A movement along a fixed supply curve is called a change in quantity supplied.
- A shift in the demand curve is called a change in demand.
- A movement along a fixed demand curve is called a change in quantity demanded.



**Table 4 What Happens to Price and Quantity When Supply or Demand Shifts?**

	No Change in Supply	An Increase in Supply	A Decrease in Supply
<b>No Change in Demand</b>	<i>P</i> same <i>Q</i> same	<i>P</i> down <i>Q</i> up	<i>P</i> up <i>Q</i> down
<b>An Increase in Demand</b>	<i>P</i> up <i>Q</i> up	<i>P</i> ambiguous <i>Q</i> up	<i>P</i> up <i>Q</i> ambiguous
<b>A Decrease in Demand</b>	<i>P</i> down <i>Q</i> down	<i>P</i> down <i>Q</i> ambiguous	<i>P</i> ambiguous <i>Q</i> down

## Summary

- Economists use the model of supply and demand to analyze competitive markets.
- In a competitive market, there are many buyers and sellers, each of whom has little or no influence on the market price.
- The demand curve shows how the quantity of a good depends upon the price.
- According to the law of demand, as the price of a good falls, the quantity demanded rises. Therefore, the demand curve slopes downward.
- In addition to price, other determinants of how much consumers want to buy include income, the prices of complements and substitutes, tastes, expectations, and the number of buyers.
- If one of these factors changes, the demand curve shifts.
- The supply curve shows how the quantity of a good supplied depends upon the price.
- According to the law of supply, as the price of a good rises, the quantity supplied rises. Therefore, the supply curve slopes upward.
- In addition to price, other determinants of how much producers want to sell include input prices, technology, expectations, and the number of sellers.
- If one of these factors changes, the supply curve shifts.
- Market equilibrium is determined by the intersection of the supply and demand curves.
- At the equilibrium price, the quantity demanded equals the quantity supplied.
- The behavior of buyers and sellers naturally drives markets toward their equilibrium.
- To analyze how any event influences a market, we use the supply-and-demand diagram to examine how the event affects the equilibrium price and quantity.
- In market economies, prices are the signals that guide economic decisions and thereby allocate resources.

## Chapter 5: Elasticity and Its Applications

### Elasticity . . .

- . . . allows us to analyze supply and demand with greater precision.
- . . . is a measure of how much buyers and sellers respond to changes in market conditions

### THE ELASTICITY OF DEMAND

- *Price elasticity of demand* is a measure of how much the quantity demanded of a good responds to a change in the price of that good.
- Price elasticity of demand is the percentage change in quantity demanded given a percent change in the price.

### The Price Elasticity of Demand and Its Determinants

- Availability of Close Substitutes
- Necessities versus Luxuries
- Definition of the Market
- Time Horizon
- Demand tends to be more elastic :
  - the larger the number of close substitutes.
  - if the good is a luxury.

- the more narrowly defined the market.
- the longer the time period.

### Computing the Price Elasticity of Demand

- The price elasticity of demand is computed as the percentage change in the quantity demanded divided by the percentage change in price.

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

- Example: If the price of an ice cream cone increases from \$2.00 to \$2.20 and the amount you buy falls from 10 to 8 cones, then your elasticity of demand would be calculated as:

$$\frac{\frac{(10-8)}{10} \times 100}{\frac{(2.20-2.00)}{2.00} \times 100} = \frac{20\%}{10\%} = 2$$

### The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities

- The midpoint formula is preferable when calculating the price elasticity of demand because it gives the same answer regardless of the direction of the change.

$$\text{Price elasticity of demand} = \frac{(Q_2 - Q_1) / [(Q_2 + Q_1) / 2]}{(P_2 - P_1) / [(P_2 + P_1) / 2]}$$

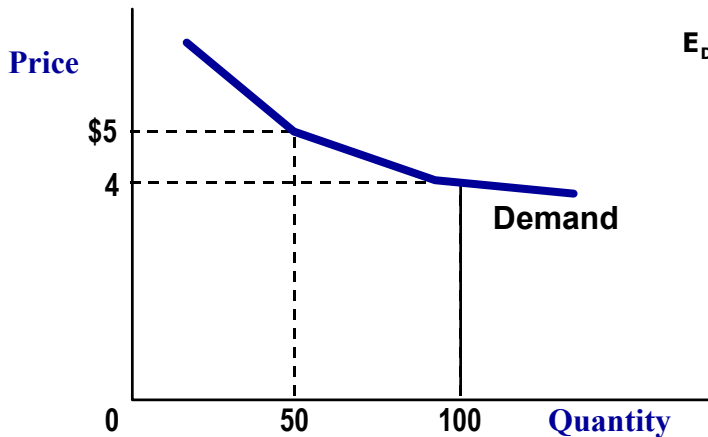
- Example: If the price of an ice cream cone increases from \$2.00 to \$2.20 and the amount you buy falls from 10 to 8 cones, then your elasticity of demand, using the midpoint formula, would be calculated as:

$$\frac{\frac{(10-8)}{(10+8)/2}}{\frac{(2.20-2.00)}{(2.00+2.20)/2}} = \frac{22\%}{9.5\%} = 2.32$$

### The Variety of Demand Curves

- Inelastic Demand
  - Quantity demanded does not respond strongly to price changes.
  - Price elasticity of demand is less than one.
- Elastic Demand
  - Quantity demanded responds strongly to changes in price.
  - Price elasticity of demand is greater than one.

### Computing the Price Elasticity of Demand



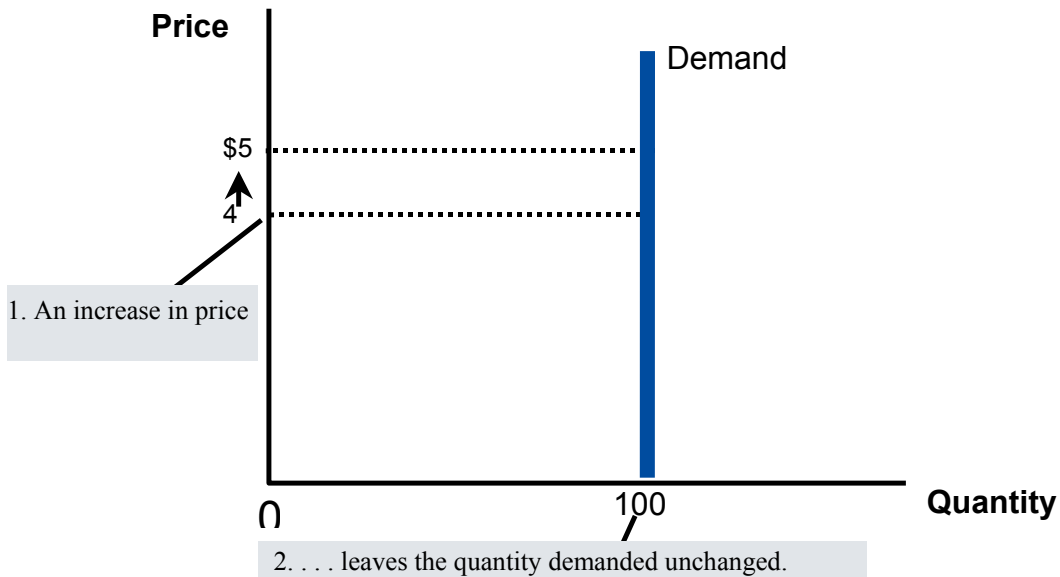
$$E_D = \frac{(100 - 50) / (100 + 50) / 2}{(4.00 - 5.00) / (4.00 + 5.00) / 2}$$

$$= \frac{67 \text{ percent}}{-22 \text{ percent}} = -3$$

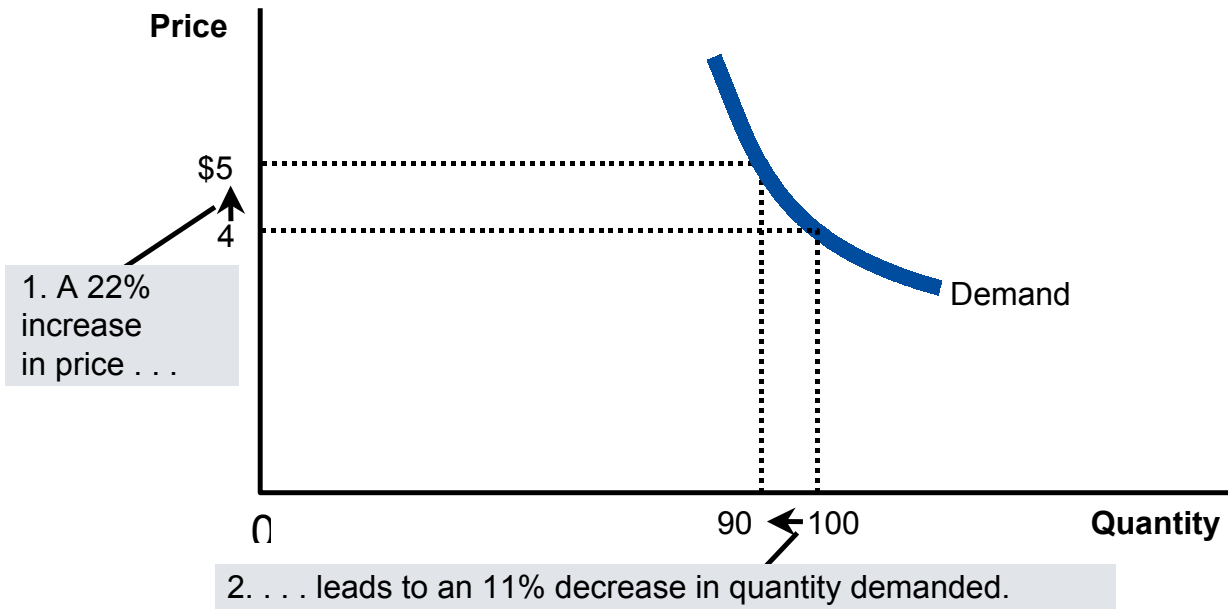
Demand is price elastic

- Perfectly Inelastic
- Quantity demanded does not respond to price changes.
- Perfectly Elastic
- Quantity demanded changes infinitely with any change in price.
- Unit Elastic
- Quantity demanded changes by the same percentage as the price.
- Because the price elasticity of demand measures how much quantity demanded responds to the price, it is closely related to the slope of the demand curve.

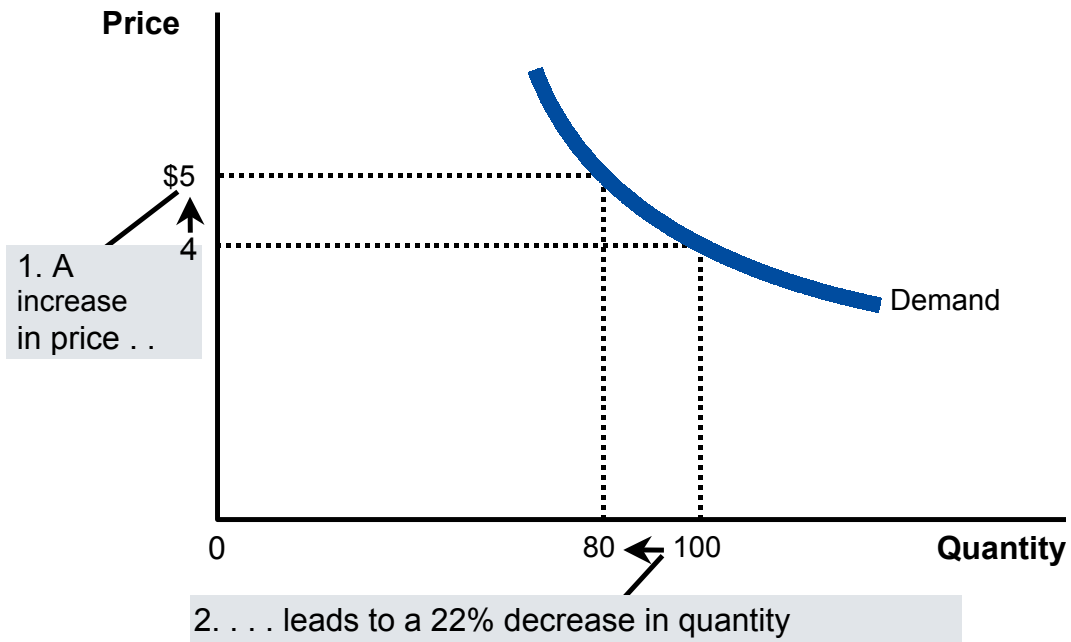
#### (a) Perfectly Inelastic Demand: Elasticity Equals 0



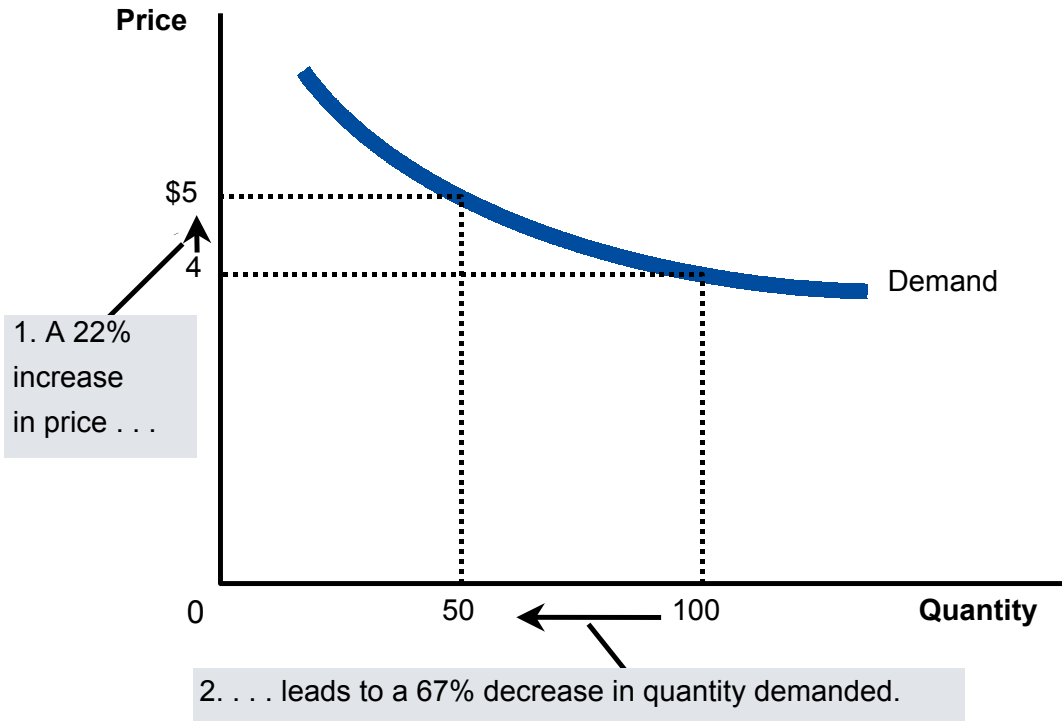
**(b) Inelastic Demand: Elasticity Is Less Than 1**



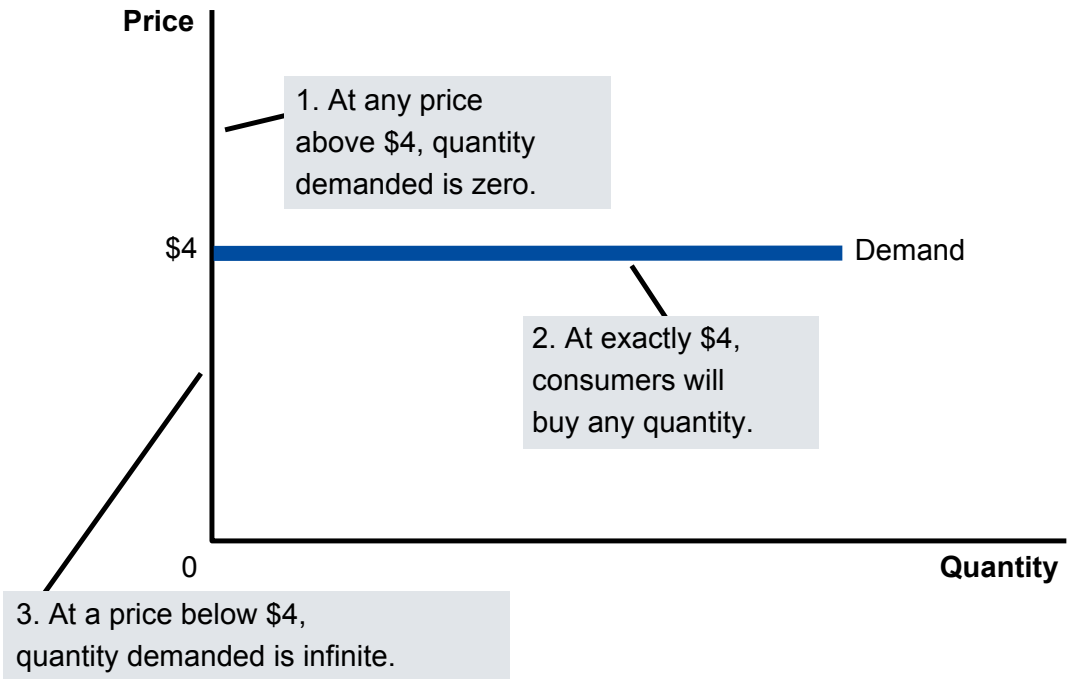
**(c) Unit Elastic Demand: Elasticity Equals**



**(d) Elastic Demand: Elasticity Is Greater Than 1**



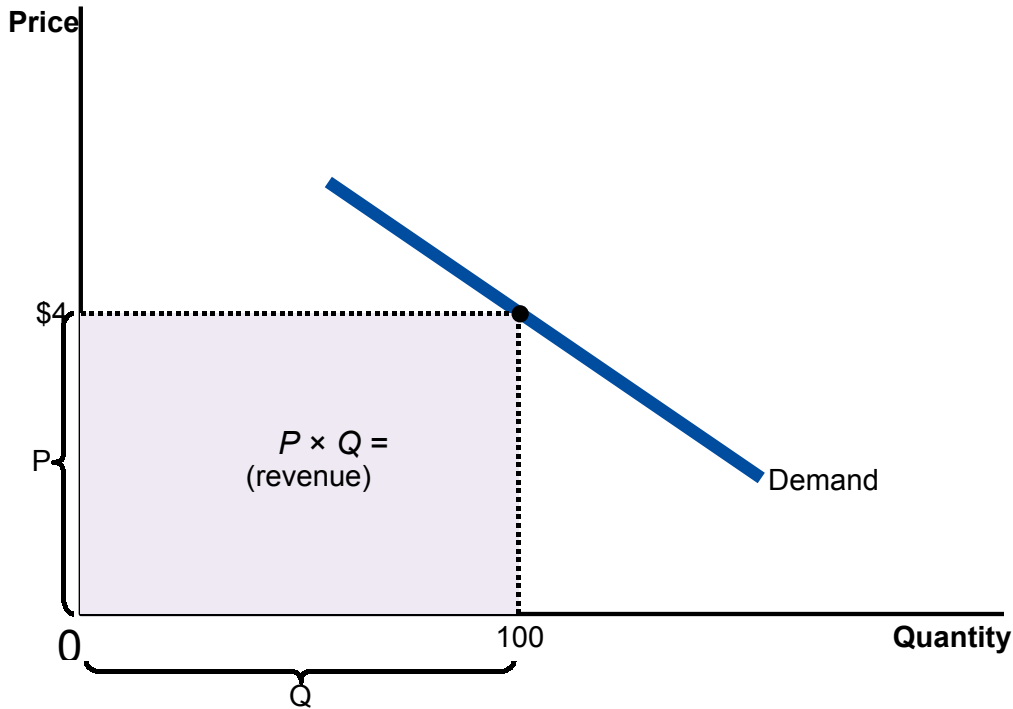
**(e) Perfectly Elastic Demand: Elasticity Equals Infinity**



### Total Revenue and the Price Elasticity of Demand

- *Total revenue* is the amount paid by buyers and received by sellers of a good.
- Computed as the price of the good times the quantity sold.

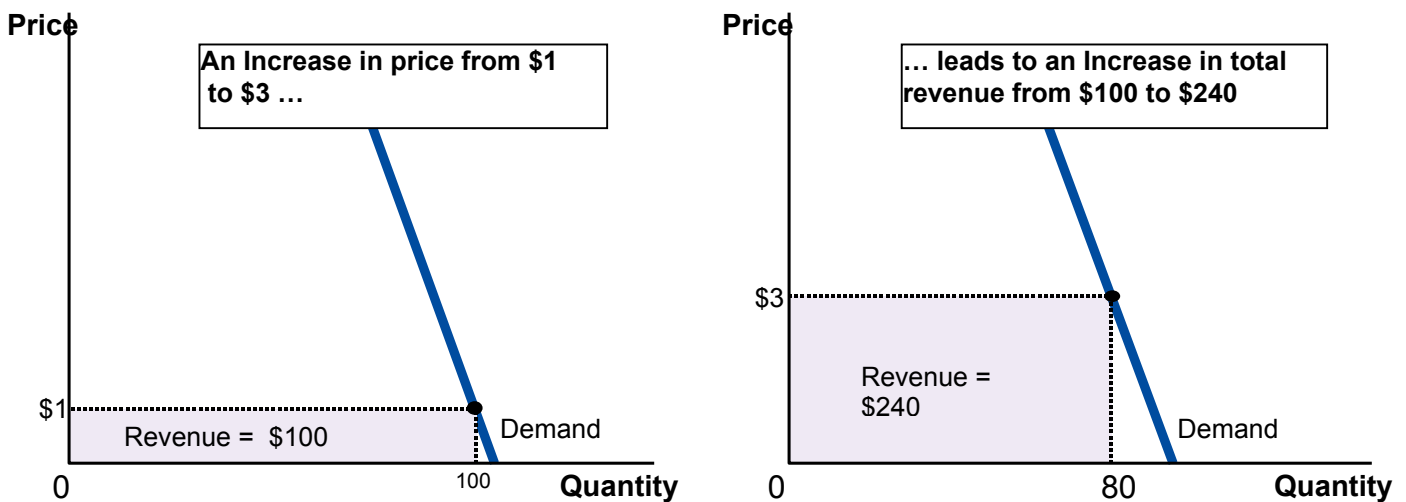
$$TR = P \times Q$$



### Elasticity and Total Revenue along a Linear Demand Curve

- With an inelastic demand curve, an increase in price leads to a decrease in quantity that is proportionately smaller. Thus, *total revenue increases*.

**Figure 3 How Total Revenue Changes When Price Changes: Inelastic Demand**

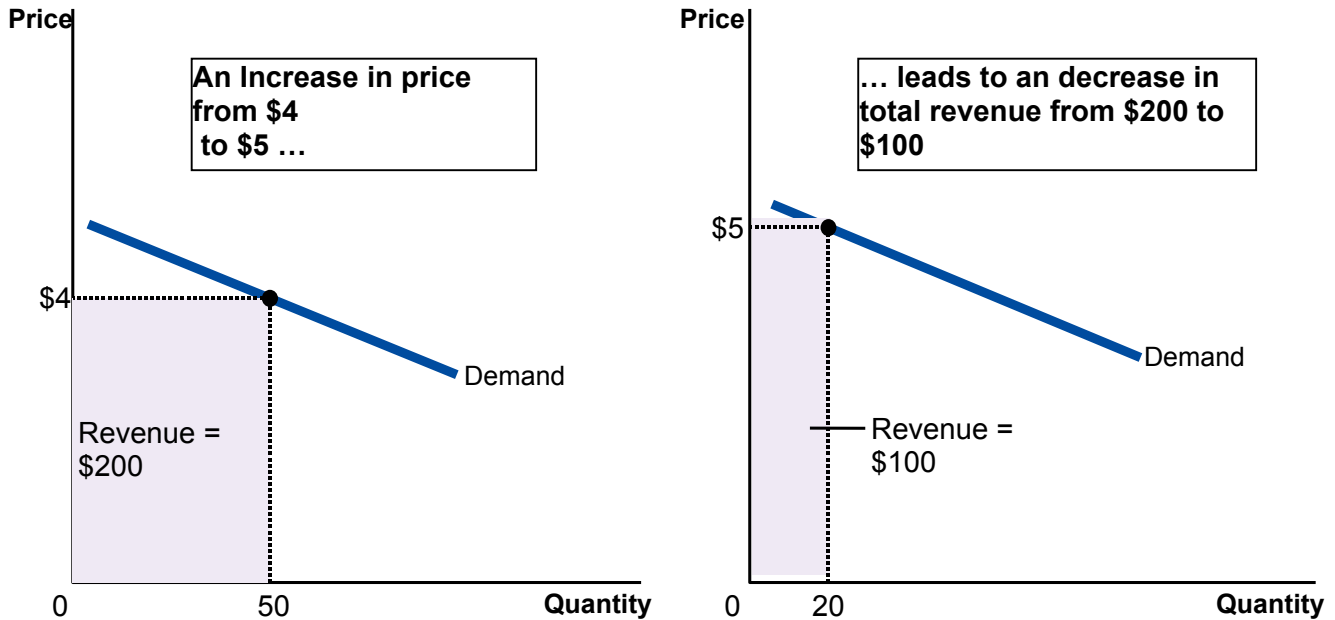




### Elasticity and Total Revenue along a Linear Demand Curve

•With an elastic demand curve, an increase in the price leads to a decrease in quantity demanded that is proportionately larger. Thus, *total revenue decreases*.

**Figure 4 How Total Revenue Changes When Price Changes: Elastic Demand**



### Elasticity of a Linear Demand Curve

Price	Quantity	Total Revenue (Price × Quantity)	Percent Change in Price	Percent Change in Quantity	Elasticity	Description
\$7	0	\$ 0	15	200	13.0	Elastic
6	2	12	18	67	3.7	Elastic
5	4	20	22	40	1.8	Elastic
4	6	24	29	29	1.0	Unit elastic
3	8	24	40	22	0.6	Inelastic
2	10	20	67	18	0.3	Inelastic
1	12	12	200	15	0.1	Inelastic
0	14	0				

### Income Elasticity of Demand

•*Income elasticity of demand* measures how much the quantity demanded of a good responds to a change in consumers' income.

•It is computed as the percentage change in the quantity demanded divided by the percentage change in income.

## Computing Income Elasticity

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

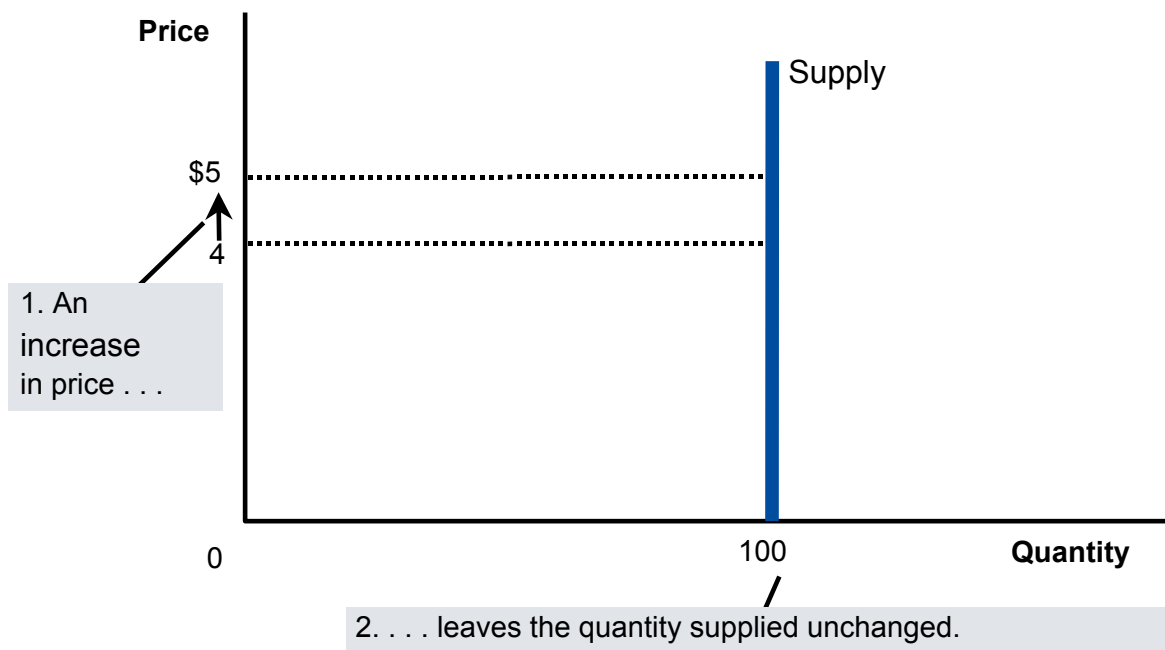
## Income Elasticity

- Types of Goods
- Normal Goods
- Inferior Goods
- Higher income raises the quantity demanded for normal goods but lowers the quantity demanded for inferior goods.
- Goods consumers regard as necessities tend to be income inelastic
- Examples include food, fuel, clothing, utilities, and medical services.
- Goods consumers regard as luxuries tend to be income elastic.
- Examples include sports cars, furs, and expensive foods.

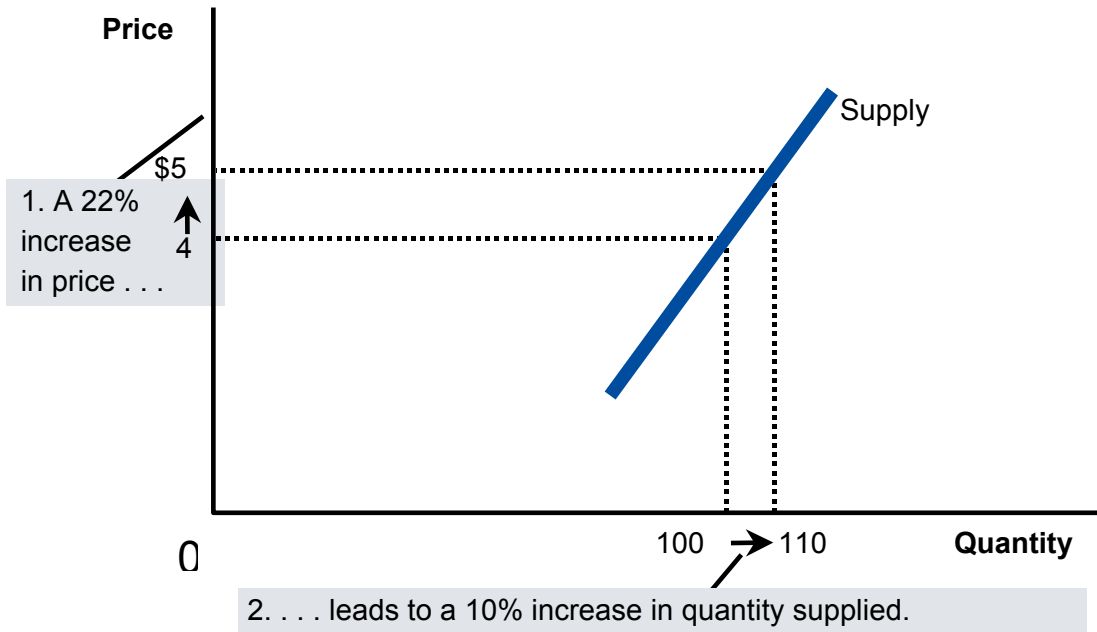
## THE ELASTICITY OF SUPPLY

- Price elasticity of supply* is a measure of how much the quantity supplied of a good responds to a change in the price of that good.
- Price elasticity of supply is the percentage change in quantity supplied resulting from a percent change in price.
- 

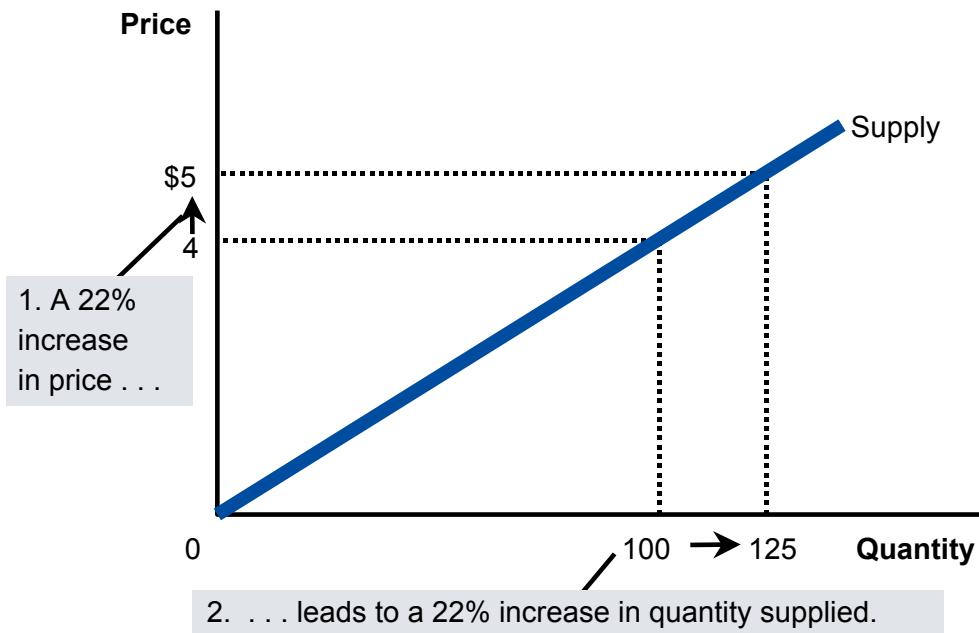
### (a) Perfectly Inelastic Supply: Elasticity Equals 0



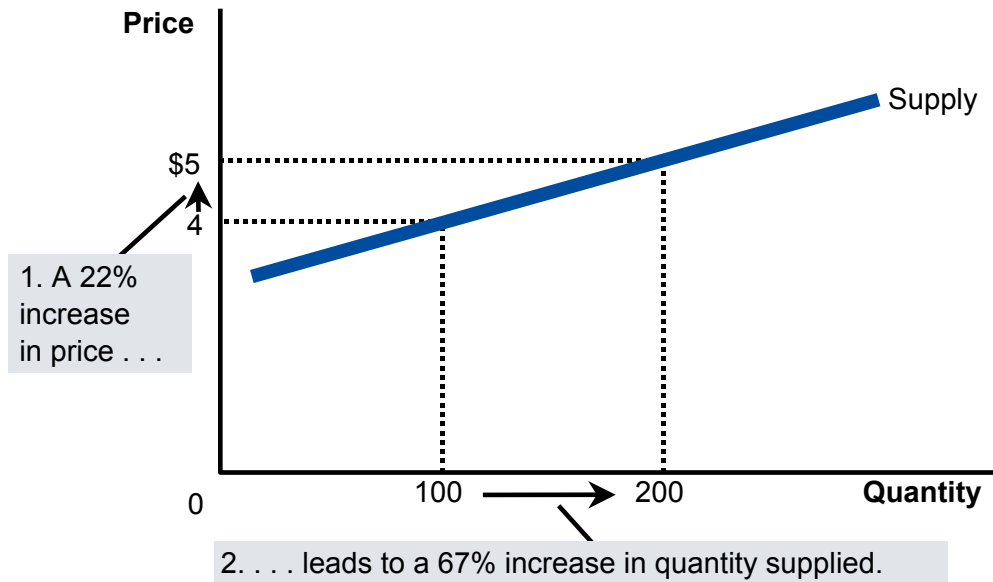
**(b) Inelastic Supply: Elasticity Is Less Than 1**



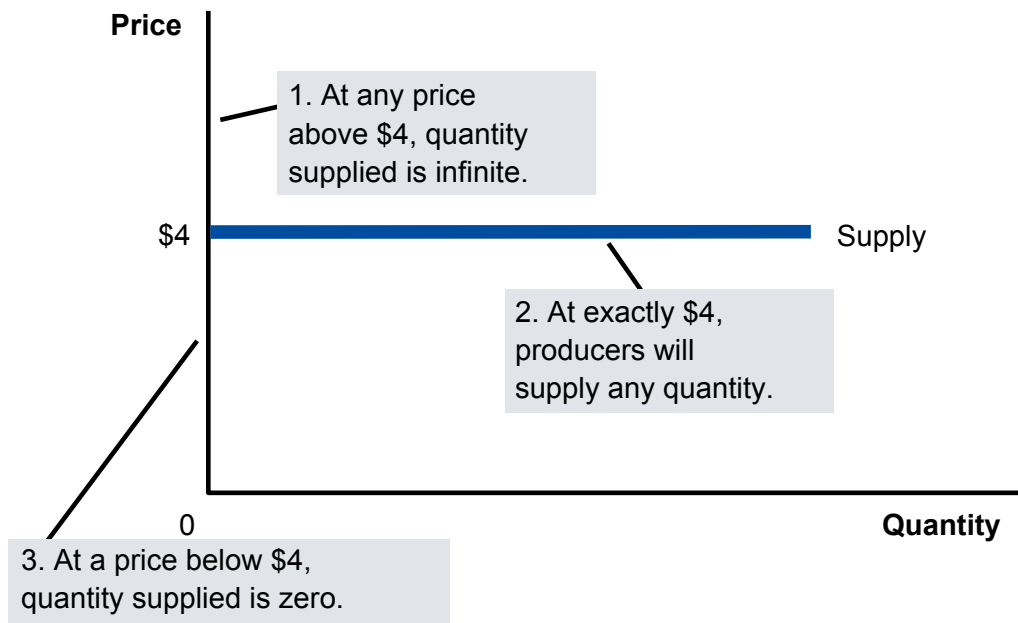
**(c) Unit Elastic Supply: Elasticity Equals 1**



**(d) Elastic Supply: Elasticity Is Greater Than 1**



**(e) Perfectly Elastic Supply: Elasticity Equals Infinity**



**Determinants of Elasticity of Supply**

- Ability of sellers to change the amount of the good they produce.
- Beach-front land is inelastic.
- Books, cars, or manufactured goods are elastic.
- Time period.
- Supply is more elastic in the long run.

### Computing the Price Elasticity of Supply

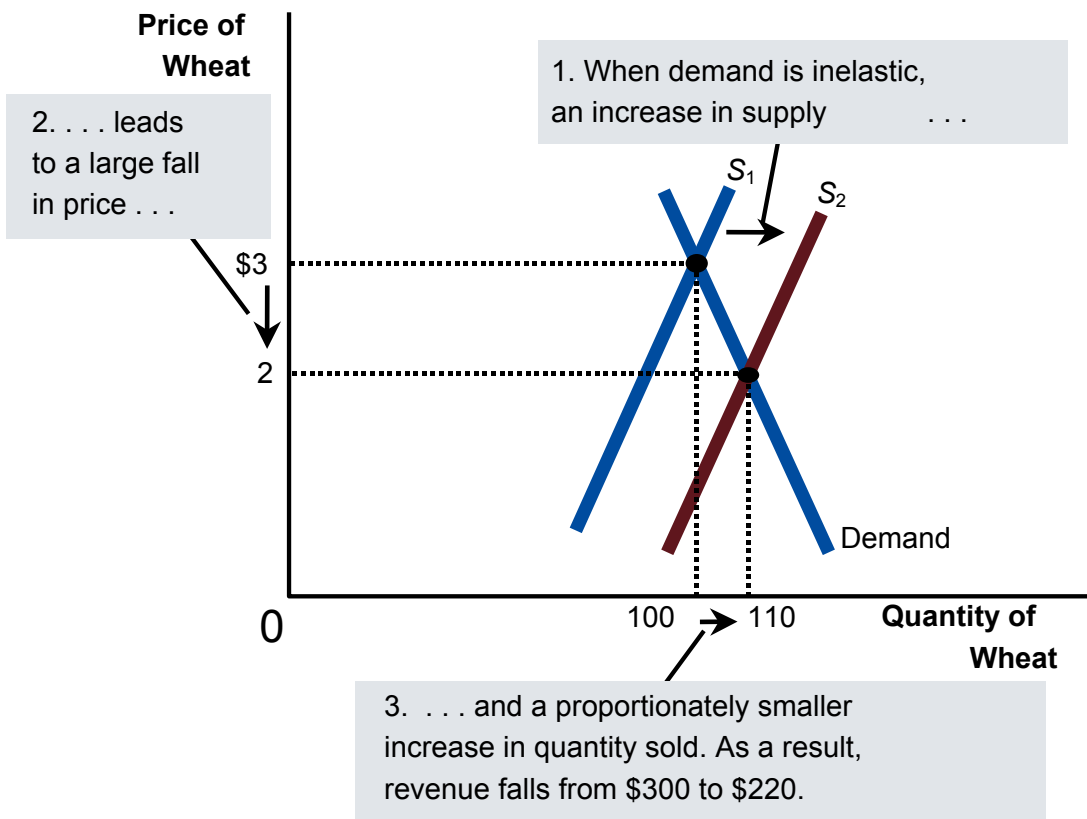
- The price elasticity of supply is computed as the percentage change in the quantity supplied divided by the percentage change in price.

$$\text{Price elasticity of supply} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

### THREE APPLICATIONS OF SUPPLY, DEMAND, AND ELASTICITY

- Can good news for farming be bad news for farmers?
- What happens to wheat farmers and the market for wheat when university agronomists discover a new wheat hybrid that is more productive than existing varieties?
- Examine whether the supply or demand curve shifts.
- Determine the direction of the shift of the curve.
- Use the supply-and-demand diagram to see how the market equilibrium changes.

**Figure 8 An Increase in Supply in the Market for Wheat**



## Compute the Price Elasticity of Supply

$$E_D = \frac{\frac{100 - 110}{(100 + 110) / 2}}{\frac{3.00 - 2.00}{(3.00 + 2.00) / 2}}$$
$$= \frac{-0.095}{0.4} \approx -0.24$$

Supply is inelastic

### Summary

- Price elasticity of demand measures how much the quantity demanded responds to changes in the price.
- Price elasticity of demand is calculated as the percentage change in quantity demanded divided by the percentage change in price.
- If a demand curve is elastic, total revenue falls when the price rises.
- If it is inelastic, total revenue rises as the price rises.
- The income elasticity of demand measures how much the quantity demanded responds to changes in consumers' income.
- The cross-price elasticity of demand measures how much the quantity demanded of one good responds to the price of another good.
- The price elasticity of supply measures how much the quantity supplied responds to changes in the price.
- In most markets, supply is more elastic in the long run than in the short run.
- The price elasticity of supply is calculated as the percentage change in quantity supplied divided by the percentage change in price.
- The tools of supply and demand can be applied in many different types of markets.

## Supply, Demand, and Government Policies

### Supply, Demand, and Government Policies

- In a free, unregulated market system, market forces establish equilibrium prices and exchange quantities.
- While equilibrium conditions may be efficient, it may be true that not everyone is satisfied.
- One of the roles of economists is to use their theories to assist in the development of policies.

### CONTROLS ON PRICES

- Are usually enacted when policymakers believe the market price is unfair to buyers or sellers.
- Result in government-created price ceilings and floors.
- *Price Ceiling* • A legal *maximum* on the price at which a good can be sold.
- *Price Floor* • A legal *minimum* on the price at which a good can be sold.

## How Price Ceilings Affect Market Outcomes

- Two outcomes are possible when the government imposes a price ceiling:
- The price ceiling *is not* binding if set *above* the equilibrium price.
- The price ceiling *is* binding if set *below* the equilibrium price, leading to a shortage.

Figure 1 A Market with a Price Ceiling

(a) A Price Ceiling That Is Not Binding

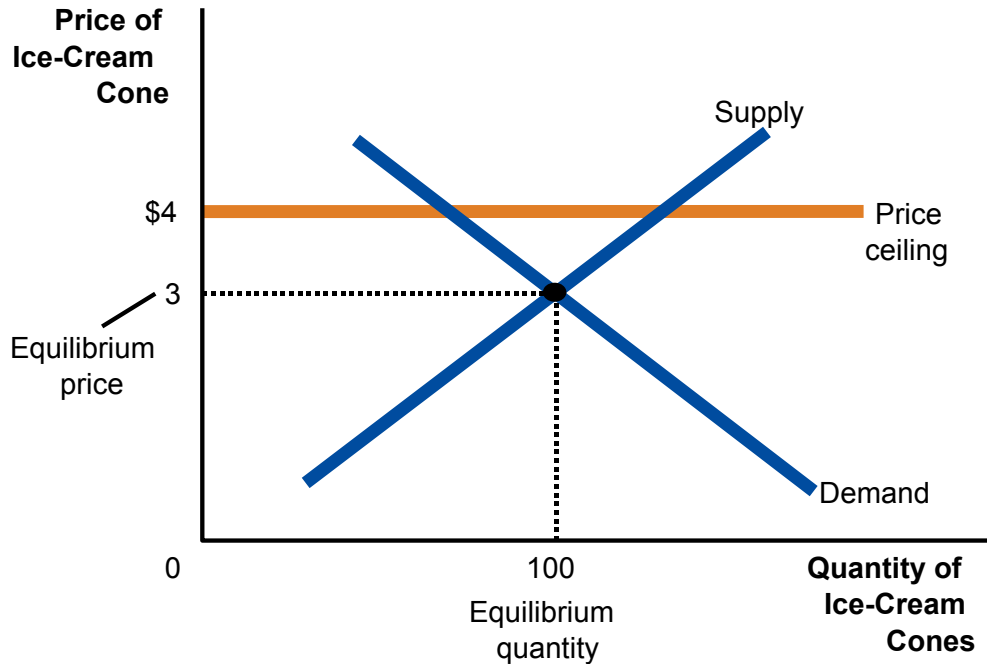
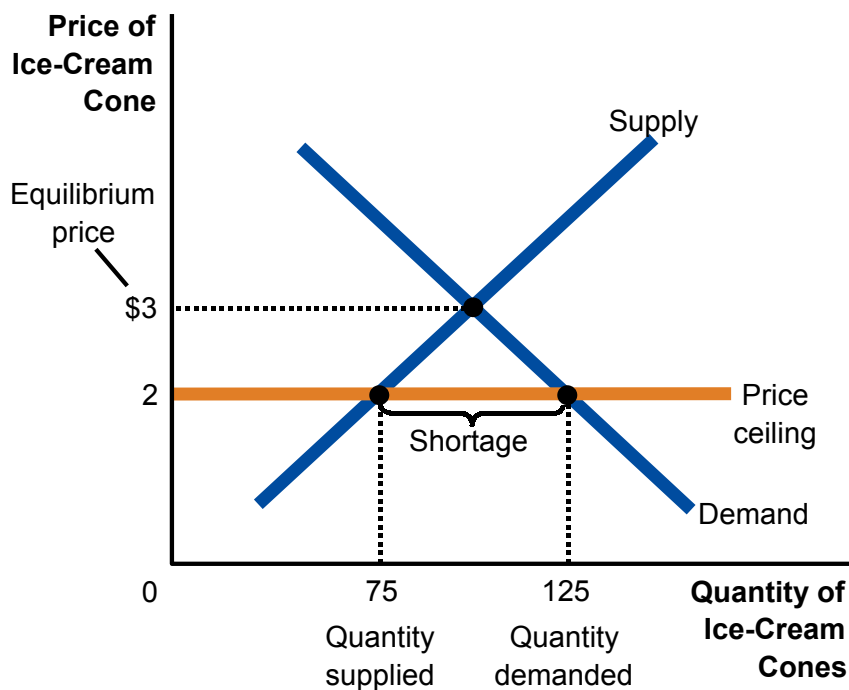


Figure 1 A Market with a Price Ceiling

(b) A Price Ceiling That Is Binding



## How Price Ceilings Affect Market Outcomes

- Effects of Price Ceilings
- A binding price ceiling creates
- shortages because  $Q_D > Q_S$ .
- Example: Gasoline shortage of the 1970s
- nonprice rationing
- Examples: Long lines, discrimination by sellers

## How Price Floors Affect Market Outcomes

- When the government imposes a price floor, two outcomes are possible.
- The price floor *is not* binding if set *below* the equilibrium price.
- The price floor *is* binding if set *above* the equilibrium price, leading to a surplus.

Figure 4 A Market with a Price Floor

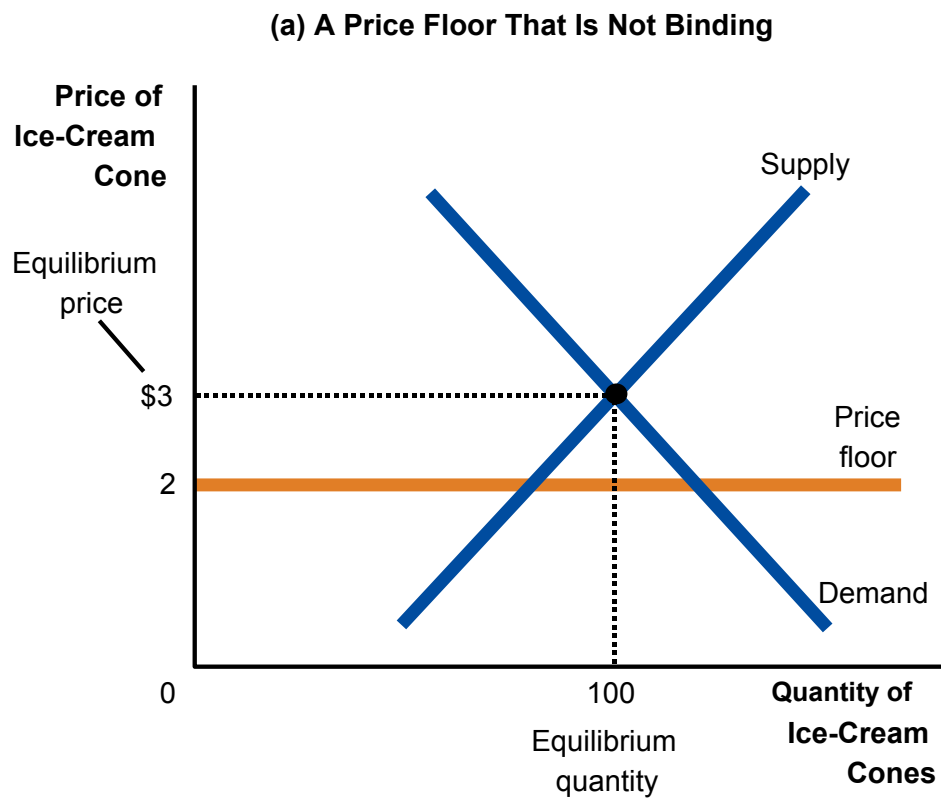
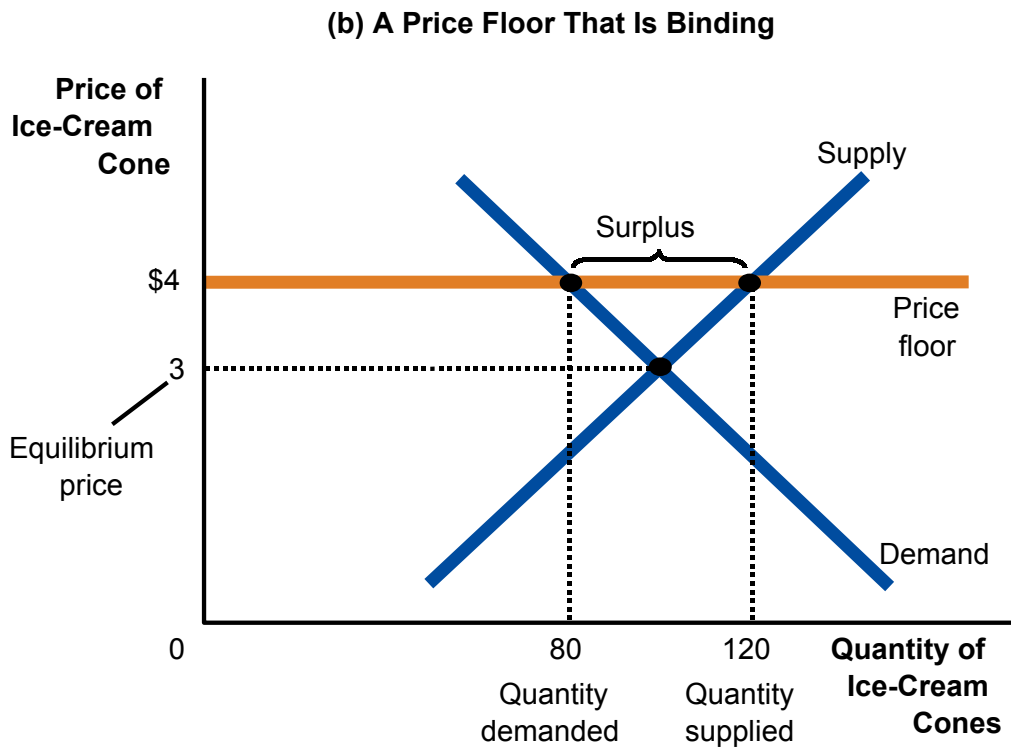




Figure 4 A Market with a Price Floor



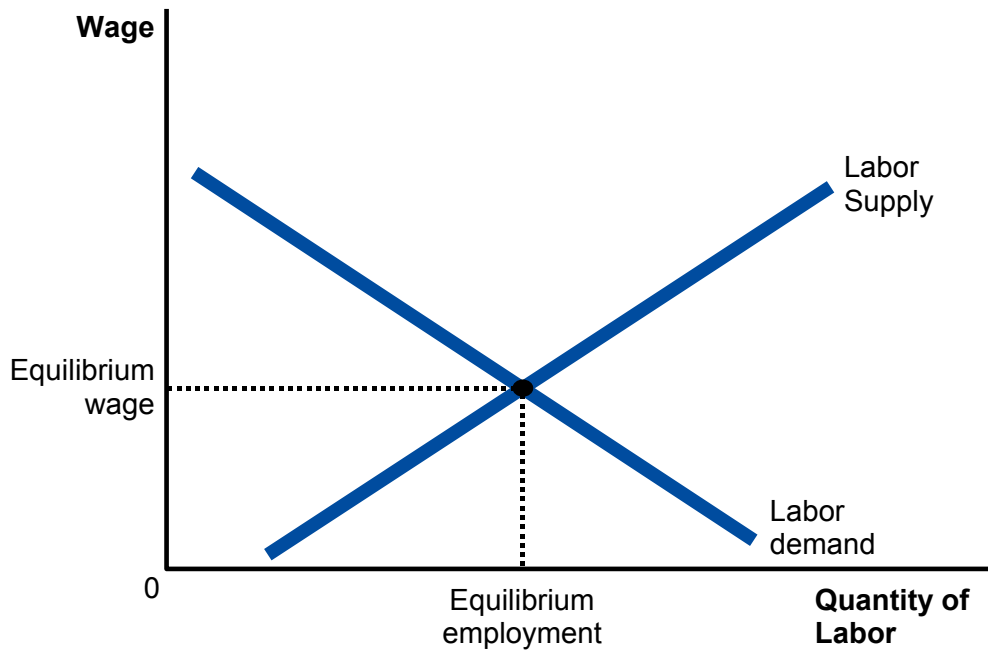
### How Price Floors Affect Market Outcomes

- A price floor prevents supply and demand from moving toward the equilibrium price and quantity.
- When the market price hits the floor, it can fall no further, and the market price equals the floor price.
- A binding price floor causes . . .
- a surplus because  $Q_S > Q_D$ .
- *nonprice rationing* is an alternative mechanism for rationing the good, using discrimination criteria.
- Examples: The minimum wage, agricultural price supports

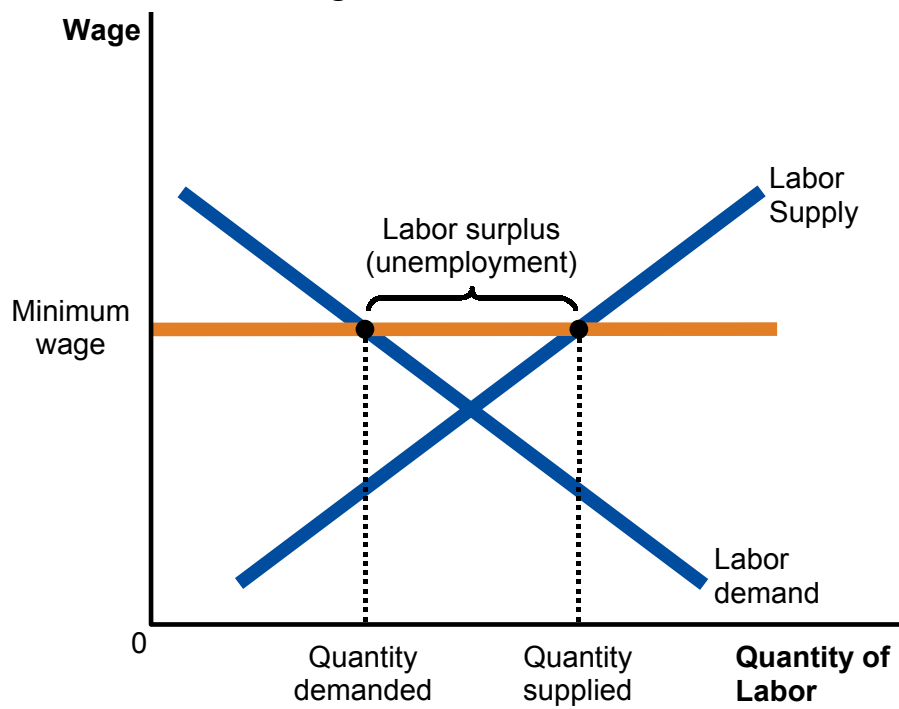
### The Minimum Wage

- An important example of a price floor is the minimum wage. Minimum wage laws dictate the lowest price possible for labor that any employer may pay.

**Figure 5 How the Minimum Wage Affects the Labor Market**



**Figure 5 How the Minimum Wage Affects the Labor Market**



**TAXES**

•Governments levy taxes to raise revenue for public projects.

**How Taxes on Buyers (and Sellers) Affect Market Outcomes**

•Taxes discourage market activity.

- When a good is taxed, the quantity sold is smaller.
- Buyers and sellers share the tax burden.

### **Summary**

- Price controls include price ceilings and price floors.
- A price ceiling is a legal maximum on the price of a good or service. An example is rent control.
- A price floor is a legal minimum on the price of a good or a service. An example is the minimum wage.
- Taxes are used to raise revenue for public purposes.
- When the government levies a tax on a good, the equilibrium quantity of the good falls

### **SUMBER RUJUKAN**

N. Gregory Mankiw. 2007. *Principle of Economics*, 4th Edition, Thomson South-Western