

Introduction to Economics

1.1

MNIT

What Economics Is All About

- **Scarcity** refers to the limited nature of society's resources.
- **Economics** is the study of how society manages its scarce resources, including
 - how people decide how much to work, save, and spend, and what to buy
 - how firms decide how much to produce, how many workers to hire
 - how society decides how to divide its resources between national defense, consumer goods, protecting the environment, and other needs

Ten Principles of Economics

How People Make Decisions

➤ PRINCIPLE #1: People face tradeoffs

“To get one thing that we like, we usually have to give up another thing that we like. Making decisions requires trading off one goal against another.”

- Example: In 1st year , a student should not abandon the study of physics just because doing so would increase the time available for the study of economics.

How People Make Decisions

- PRINCIPLE #2: The cost of something is what you give up to get it
- **Opportunity cost:** It is forgone benefit that would have been derived by an option not chosen. It is the value of next-highest-valued alternative use of that resource.
- Consider the decision to go to college. The main benefits are intellectual enrichment and a lifetime of better job opportunities. But what are the costs?

How People Make Decisions

- PRINCIPLE #3: Rational people think at the margin.
- Many decisions are not “all or nothing,” but involve marginal changes – incremental adjustments to an existing plan
- Evaluating the costs and benefits of marginal changes is an important part of decision making
- As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture and sell to maximize profits. You will also encounter individuals who decide how much time to spend working. So people analyse incremental (marginal) change to take decisions.

How People Make Decisions

- PRINCIPLE #4: People respond to incentives
 - An **incentive** is something that induces a person to act, such as the prospect of a punishment or a reward
 - Rational people respond to incentives because they make decisions by comparing costs and benefits. Examples:
 - when the price of an apple rises, people decide to eat fewer apples.

How People Interact

- PRINCIPLE #5: Trade can make everyone better off
- Rather than being self-sufficient, people can specialize in producing one good or service and exchange it for other goods
- Countries also benefit from trade & specialization:
 - get a better price abroad for goods they produce
 - buy other goods more cheaply from abroad than could be produced at home

How People Interact

- PRINCIPLE #6: Markets are usually a good way to organize economic activity.
- A market is a group of buyers and sellers.
(They need not be in a single location.)
- “Organize economic activity” means determining
 - what goods to produce
 - how to produce them
 - how much of each to produce
 - who gets them
- In a market economy, these decisions result from the interactions of many households and firms.
- In a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

How People Interact

- PRINCIPLE #7: Governments Can Sometimes Improve Market Outcomes
 - Important role for govt: enforce property rights (with police, courts)
- Market economies need institutions to enforce **property rights** so individuals can own and control scarce resources. A farmer won't grow food if he expects his crop to be stolen.

How the Economy as a Whole Works

- PRINCIPLE #8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services
- To boost living standards, policymakers need to raise productivity by ensuring that workers are well educated, have the tools needed to produce goods and services, and have access to the best available technology.

How the Economy as a Whole Works

- PRINCIPLE #9: Prices Rise When the Government Prints Too Much Money
- More Money -> More Demand-> Shortage of Supply -> Price Rise.

Why You Should Study Economics?

- PRINCIPLE #10: Society Faces a Short-Run Trade-off between Inflation and Unemployment.
- fluctuations in economic activity i.e production and Employment -> Fluctuations in Prices
- High Employment(Less Unemployment) -> More Demanders-> Shortage of Supply-> Price Rise (Inflation)
- High Inflation -> Less Demand -> Less number of workers in factories -> High Unemployment

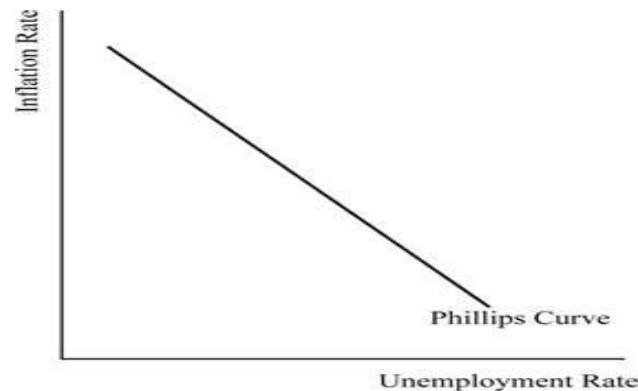


Figure 1

Central problems of an economy

- What to Produce?
- How to Produce?
- For Whom to Produce?

Capitalist

- What: maximum demand, maximum price, value high, profit, min cost of production, min time, min investment, max efficiency
- How: cheap resources, lowest cost of production
- Whom: highest bidder, often rich people, high income group.

Mixed economy

- What: middle ground both demand and benefit for the society
- How: both capital and labour intensive
- Whom: everyone

Socialist economy

1. What: beneficial for the people eg, digitalisation of rural area, education, infrastructure, healthcare, necessary goods, food, transport connectivity, employment and labour, safety
2. How: labour intensive activities, use of abundant resources of the country
3. Whom: everyone equally, no biases

Microeconomics and Macroeconomics

- Microeconomics
 - Study the decisions of individual households and firms
 - the study of how households and firms make decisions and how they interact in markets

- Macroeconomics
 - Study of economy-wide phenomena.
 - the study of how government and Central bank make decisions on the problems like inflation, unemployment, and economic growth etc.

- * Despite the inherent link between microeconomics and macroeconomics, the two fields are distinct. Because they address different questions, each field has its own set of models, which are often taught in separate courses

Addressing the Central Problems

Basic Economic Theories

- Theory of demand
- Theory of Consumer Behaviour
- Theory of Production
- Theory of Cost
- Theory of Market Structure
- Theory of Pricing
- Cost-benefit analysis

Basic Economic Decision Making

- Production decision

What to produce and in what quantity to produce

Scale of production

- Exchange Decision

Where to sell and at what price to sell

- Efficient Investment Decision

Thank You

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In this chapter, look for the answers to these questions:

- What kinds of questions does economics address?
- What are the principles of how people make decisions?
- What are the principles of how people interact?
- What are the principles of how the economy as a whole works?

What Economics Is All About

- **Scarcity** refers to the limited nature of society's resources.
- **Economics** is the study of how society manages its scarce resources, including
 - how people decide how much to work, save, and spend, and what to buy
 - how firms decide how much to produce, how many workers to hire
 - how society decides how to divide its resources between national defense, consumer goods, protecting the environment, and other needs

HOW PEOPLE MAKE DECISIONS

- Decision making is at the heart of economics.
- The first four principles deal with how people make decisions.



HOW PEOPLE MAKE DECISIONS

Principle #1: People Face Tradeoffs

All decisions involve tradeoffs. Examples:

- Going to a party the night before your midterm leaves less time for studying.
- Having more money to buy stuff requires working longer hours, which leaves less time for leisure.
- Protecting the environment requires resources that might otherwise be used to produce consumer goods.

HOW PEOPLE MAKE DECISIONS

Principle #1: People Face Tradeoffs

- Society faces an important tradeoff:
efficiency vs. equity
- **efficiency**: getting the most out of scarce resources
- **equity**: distributing prosperity fairly among society's members
- Tradeoff: To increase equity, can redistribute income from the well-off to the poor.
But this reduces the incentive to work and produce, and shrinks the size of the economic “pie.”

HOW PEOPLE MAKE DECISIONS

Principle #2: The Cost of Something Is What You Give Up to Get It

- Making decisions requires comparing the costs and benefits of alternative choices.
- The **opportunity cost** of any item is whatever must be given up to obtain it.
- It is the relevant cost for decision making.

HOW PEOPLE MAKE DECISIONS

Principle #2: The Cost of Something Is What You Give Up to Get It

Examples:

The opportunity cost of...

- ...going to college for a year is not just the tuition, books, and fees, but also the foregone wages.
- ...seeing a movie is not just the price of the ticket, but the value of the time you spend in the theater.

HOW PEOPLE MAKE DECISIONS

Principle #3: Rational People Think at the Margin

- A person is **rational** if she systematically and purposefully does the best she can to achieve her objectives.
- Many decisions are not “all or nothing,” but involve **marginal changes** – incremental adjustments to an existing plan.
- Evaluating the costs and benefits of marginal changes is an important part of decision making.

HOW PEOPLE MAKE DECISIONS

Principle #3: Rational People Think at the Margin

Examples:

- A student considers whether to go to college for an additional year, comparing the fees & foregone wages to the extra income he could earn with an extra year of education.
- A firm considers whether to increase output, comparing the cost of the needed labor and materials to the extra revenue.

HOW PEOPLE MAKE DECISIONS

Principle #4: People Respond to Incentives

- **incentive:** something that induces a person to act, *i.e.* the prospect of a reward or punishment.
- Rational people respond to incentives because they make decisions by comparing costs and benefits. Examples:
 - In response to higher gas prices, sales of “hybrid” cars (*e.g.*, Toyota Prius) rise.
 - In response to higher cigarette taxes, teen smoking falls.

ACTIVE LEARNING 1:

Exercise

You are selling your 1996 Mustang. You have already spent \$1000 on repairs.

At the last minute, the transmission dies. You can pay \$600 to have it repaired, or sell the car “as is.”

In each of the following scenarios, should you have the transmission repaired?

- A.** Blue book value is \$6500 if transmission works, \$5700 if it doesn't
- B.** Blue book value is \$6000 if transmission works, \$5500 if it doesn't

ACTIVE LEARNING 1:

Answers

Cost of fixing transmission = \$600

A. Blue book value is \$6500 if transmission works,
\$5700 if it doesn't

Benefit of fixing the transmission = \$800
(\$6500 – 5700).

It's worthwhile to have the transmission fixed.

B. Blue book value is \$6000 if transmission works,
\$5500 if it doesn't

Benefit of fixing the transmission is only \$500.

Paying \$600 to fix transmission is not worthwhile.

ACTIVE LEARNING 1:

Answers

Observations:

- The \$1000 you previously spent on repairs is irrelevant. What matters is the cost and benefit of the *marginal* repair (the transmission).
- The change in incentives from scenario A to scenario B caused your decision to change.

HOW PEOPLE INTERACT

- An “economy” is just a group of people interacting with each other.
- The next three principles deal with how people interact.



HOW PEOPLE INTERACT

Principle #5: Trade Can Make Everyone Better Off

- Rather than being self-sufficient, people can specialize in producing one good or service and exchange it for other goods.
- Countries also benefit from trade & specialization:
 - get a better price abroad for goods they produce
 - buy other goods more cheaply from abroad than could be produced at home

HOW PEOPLE INTERACT

Principle #6: Markets Are Usually A Good Way to Organize Economic Activity

- A **market** is a group of buyers and sellers.
(They need not be in a single location.)
- “Organize economic activity” means determining
 - what goods to produce
 - how to produce them
 - how much of each to produce
 - who gets them

HOW PEOPLE INTERACT

Principle #6: Markets Are Usually A Good Way to Organize Economic Activity

- In a market economy, these decisions result from the interactions of many households and firms.
- Famous insight by Adam Smith in *The Wealth of Nations* (1776):
Each of these households and firms acts as if “led by **an invisible hand**” to promote general economic well-being.

HOW PEOPLE INTERACT

Principle #6: Markets Are Usually A Good Way to Organize Economic Activity

- The invisible hand works through the price system:
 - The interaction of buyers and sellers determines prices of goods and services.
 - Each price reflects the good's value to buyers and the cost of producing the good.
 - Prices guide self-interested households and firms to make decisions that, in many cases, maximize society's economic well-being.

HOW PEOPLE INTERACT

Principle #7: Governments Can Sometimes Improve Market Outcomes

- Important role for govt: enforce property rights (with police, courts)
- People are less inclined to work, produce, invest, or purchase if large risk of their property being stolen.
 - A restaurant won't serve meals if customers do not pay before they leave.
 - A music company won't produce CDs if too many people avoid paying by making illegal copies.

HOW PEOPLE INTERACT

Principle #7: Governments Can Sometimes Improve Market Outcomes

- Govt may alter market outcome to promote efficiency
- **market failure**, when the market fails to allocate society's resources efficiently. Causes:
 - **externalities**, when the production or consumption of a good affects bystanders (e.g. pollution)
 - **market power**, a single buyer or seller has substantial influence on market price (e.g. monopoly)
- In such cases, public policy may increase efficiency.

HOW PEOPLE INTERACT

Principle #7: Governments Can Sometimes Improve Market Outcomes

- Govt may alter market outcome to promote equity
- If the market's distribution of economic well-being is not desirable, tax or welfare policies can change how the economic “pie” is divided.

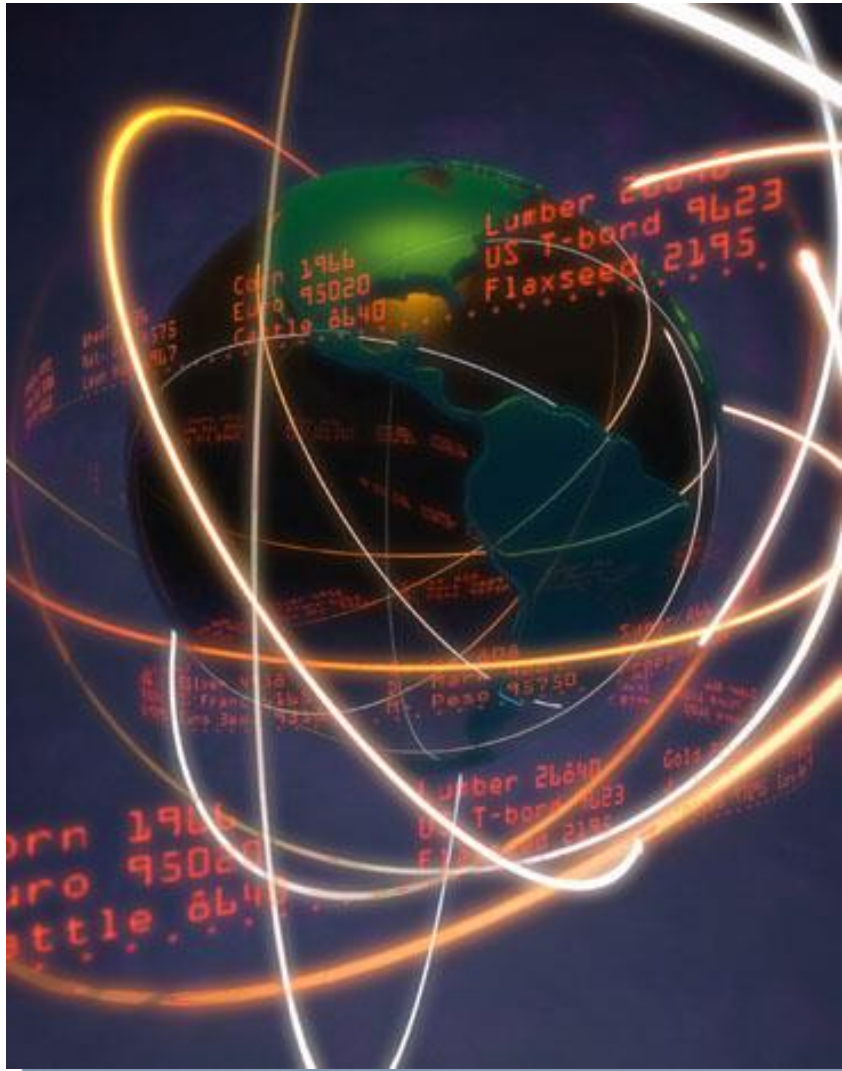
ACTIVE LEARNING 2:

Discussion Questions

In each of the following situations, what is the government's role? Does the government's intervention improve the outcome?

- a.** Public schools for K-12
- b.** Workplace safety regulations
- c.** Public highways
- d.** Patent laws, which allow drug companies to charge high prices for life-saving drugs

HOW THE ECONOMY AS A WHOLE WORKS



- The last three principles deal with the economy as a whole.

HOW THE ECONOMY AS A WHOLE WORKS

Principle #8: A country's standard of living depends on its ability to produce goods & services.

- Huge variation in living standards across countries and over time:
 - Average income in rich countries is more than ten times average income in poor countries.
 - The U.S. standard of living today is about eight times larger than 100 years ago.

HOW THE ECONOMY AS A WHOLE WORKS

Principle #8: A country's standard of living depends on its ability to produce goods & services.

- The most important determinant of living standards: **productivity**, the amount of goods and services produced per unit of labor.
- Productivity depends on the equipment, skills, and technology available to workers.
- Other factors (e.g., labor unions, competition from abroad) have far less impact on living standards.

HOW THE ECONOMY AS A WHOLE WORKS

Principle #9: Prices rise when the government prints too much money.

- **Inflation**: increases in the general level of prices.
- In the long run, inflation is almost always caused by excessive growth in the quantity of money, which causes the value of money to fall.
- The faster the govt creates money, the greater the inflation rate.

HOW THE ECONOMY AS A WHOLE WORKS

Principle #10: Society faces a short-run tradeoff between inflation and unemployment

- In the short-run (1 – 2 years), many economic policies push inflation and unemployment in opposite directions.
- Other factors can make this tradeoff more or less favorable, but the tradeoff is always present.

CONCLUSION

- Economics offers many insights about the behavior of people, markets, and economies.
- It is based on a few ideas that can be applied in many situations.
- Whenever we refer back to one of the ***Ten Principles*** from this chapter, you will see an icon like this one:



CHAPTER SUMMARY

- The principles of decision making are:
 - People face tradeoffs.
 - The cost of any action is measured in terms of foregone opportunities.
 - Rational people make decisions by comparing marginal costs and marginal benefits.
 - People respond to incentives.

CHAPTER SUMMARY

- The principles of interactions among people are:
 - Trade can be mutually beneficial.
 - Markets are usually a good way of coordinating trade.
 - Govt can potentially improve market outcomes if there is a market failure or if the market outcome is inequitable.

CHAPTER SUMMARY

- The principles of the economy as a whole are:
 - Productivity is the ultimate source of living standards.
 - Money growth is the ultimate source of inflation.
 - Society faces a short-run tradeoff between inflation and unemployment.

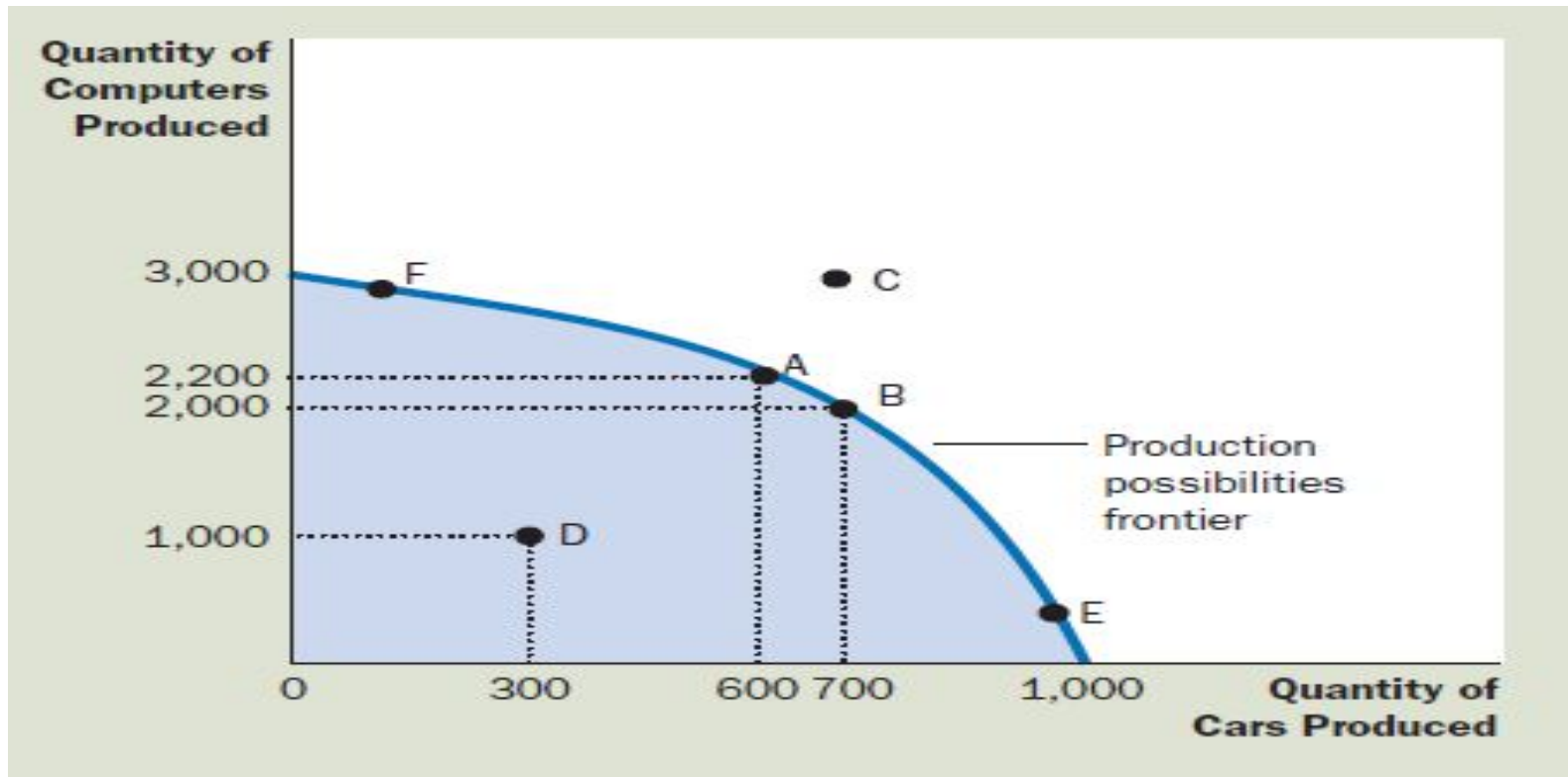
THE PRODUCTION POSSIBILITIES FRONTIER

Production Possibilities Frontier (PPF)

- A graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology.

Production Possibilities Frontier (PPF)

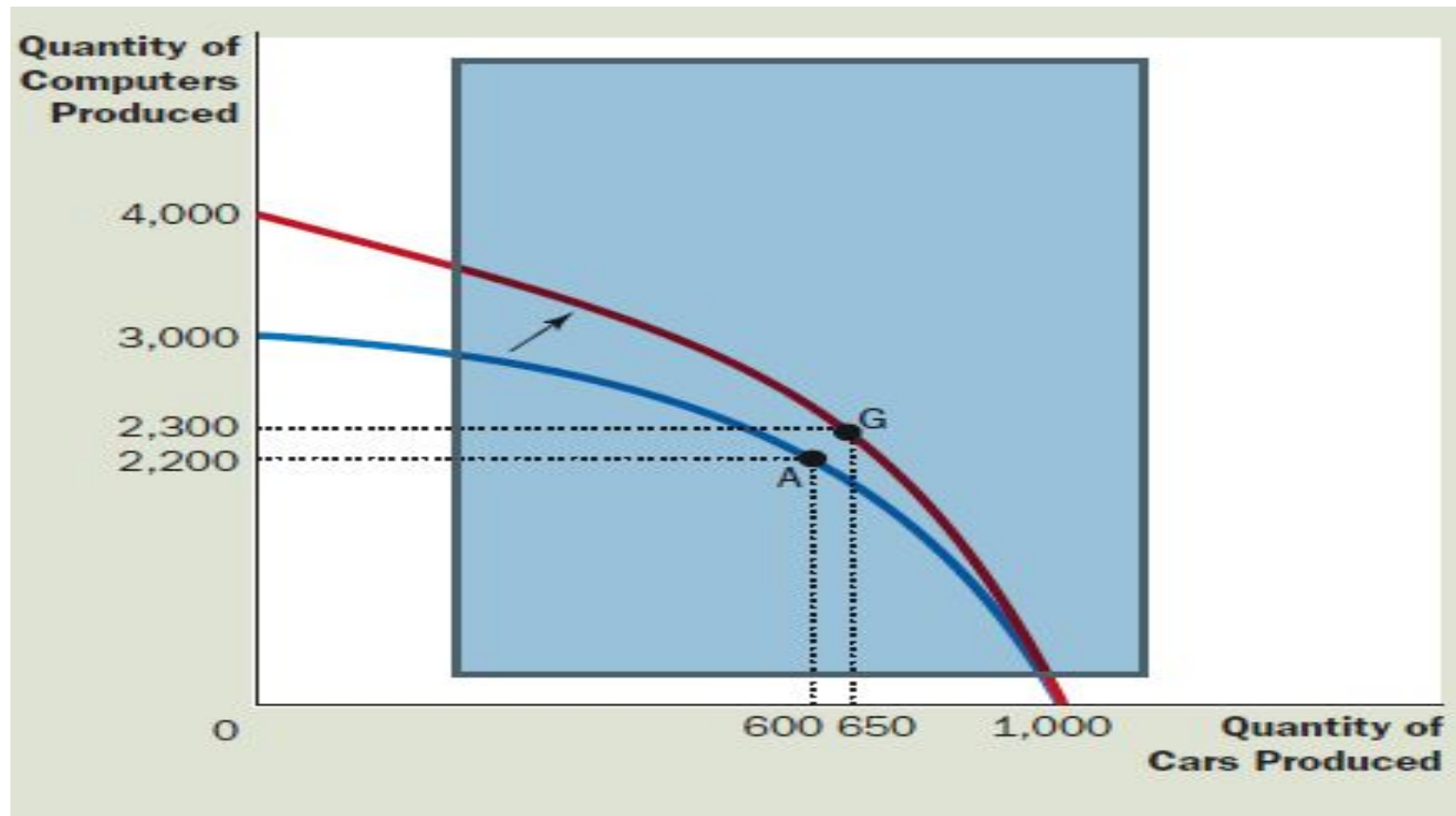
- Real economies produce thousands of goods and services, let's assume an economy that produces only two goods—cars and computers.



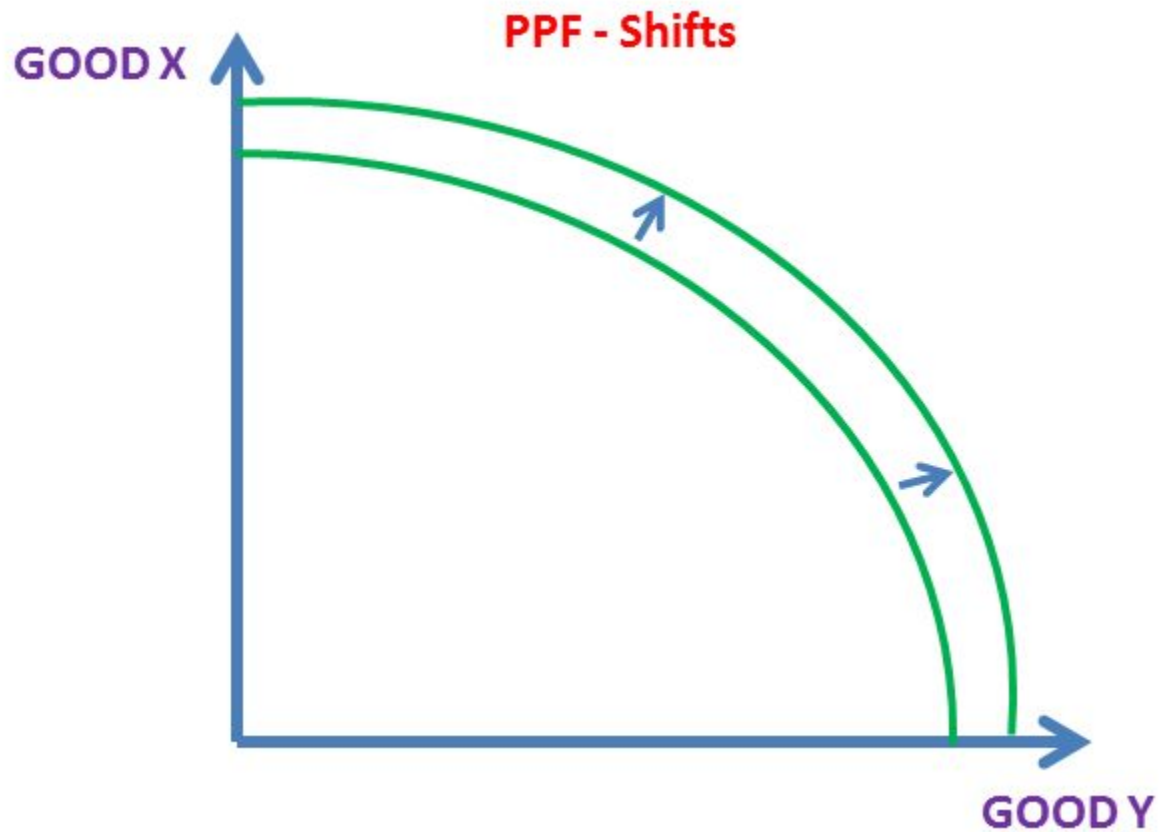
Production Possibilities Frontier (PPF)

- People face trade-offs. The production possibilities frontier shows one trade-off that society faces. Once we have reached the efficient points on the frontier, the only way of getting more of one good is to get less of the other. When the economy moves from point A to point B, for instance, society produces 100 more cars but at the expense of producing 200 fewer computers.
- The production possibilities frontier shows the opportunity cost of one good as measured in terms of the other good . When society moves from point A to point B, it gives up 200 computers to get 100 additional cars. That is, at point A, the opportunity cost of 100 cars is 200 computers.

A Shift in the Production Possibilities Frontier (PPF) : technological advance in the computer industry



Shift in PPF: Increase in the Factors of Production



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DEMAND ANALYSIS

2.2

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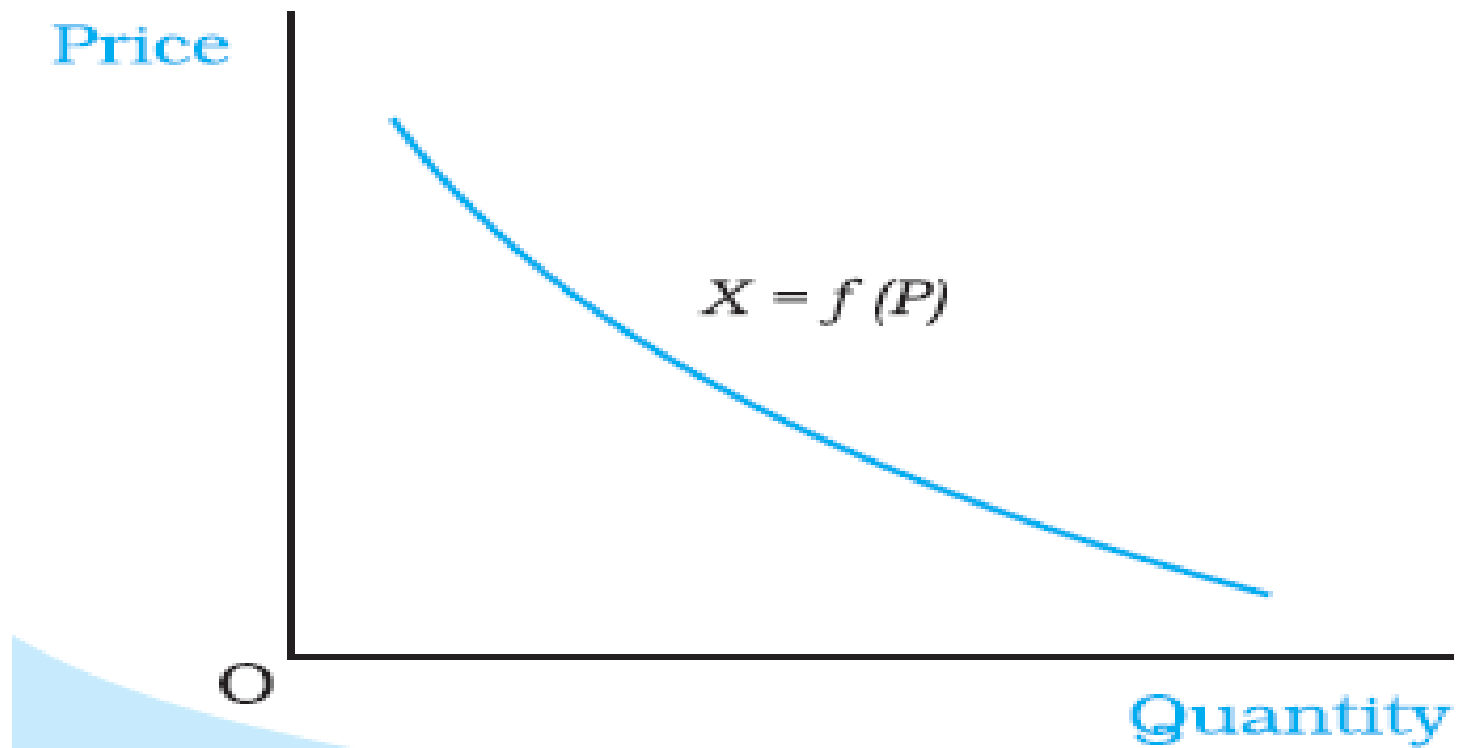
Demand

- The quantity of a commodity that a consumer is willing to buy and is able to afford, given prices of goods and consumer's tastes and preferences is called **demand for the commodity**
- **Demand Function and Demand Curve**
 - The relation between the consumer's optimal choice of the quantity of a good and its price is called the **Demand function**
 - The consumer's demand for a good as a function of its price can be written as

$$X = f(P)$$

- The relation between the consumer's demand for a good and the price of the good is likely to be negative in general
- The graphical representation of the demand function is called the **demand curve**

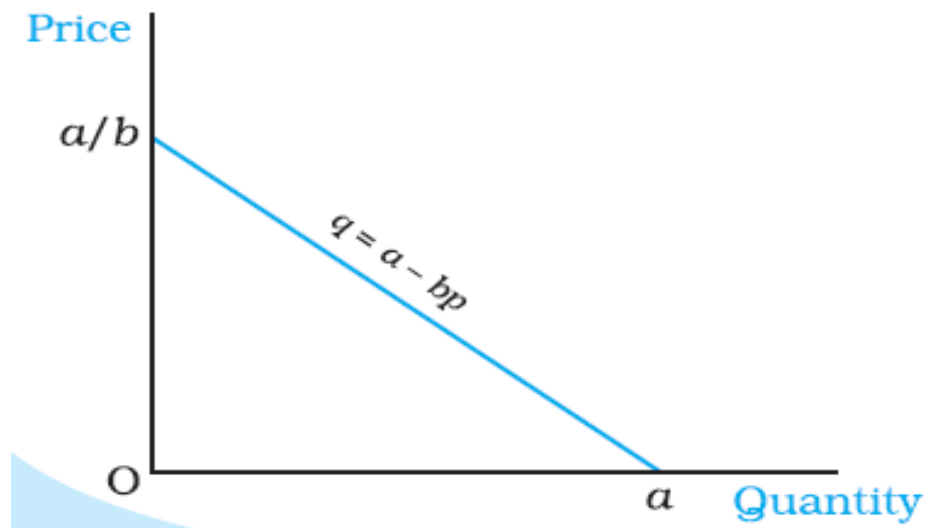
Demand



Law of Demand

- **Law of Demand** states that other things being equal, there is a negative relation between demand for a commodity and its price.
- A linear demand curve can be written as

$$q = a - bp$$



Normal and Inferior Goods

- **Normal Goods:** The goods in which demand of a commodity increases with the increase in income.
- **Inferior Goods:** The goods in which demand of a commodity decreases with the increase in income.
- **Giffen good:** The goods in which demand of a commodity decreases with the decrease in price.

Determinants of Demand

➤ Price (P)

- Normal Goods : $P \uparrow \longrightarrow Q \downarrow$
- Giffen Goods: $P \uparrow \longrightarrow Q \uparrow$

➤ Income (M)

- Normal Goods: $M \uparrow \longrightarrow Q \uparrow$
- Inferior Goods: $M \uparrow \longrightarrow Q \downarrow$

➤ Price of Related Goods(P_2)

- **Substitute goods:** Goods which are not consumed together . They are substituted with each other. Ex: Tea and Coffee . $P_2 \text{ (Coffee)} \uparrow \longrightarrow Q_x \text{ (Tea)} \uparrow$
- **Complementary goods:** Goods which are consumed together. Ex: Pen and Ink. . $P_2 \text{ (Ink)} \uparrow \longrightarrow Q_x \text{ (Pen)} \downarrow$

➤ Taste and Preferences: Taste and preference in favour of good then $Q \uparrow$

➤ Future Expectations of Price (P_e): $P_e \uparrow \longrightarrow Q \text{ (Current Demand)} \downarrow$

Changes in Demand Curve

➤ **Movements along the Demand Curve**

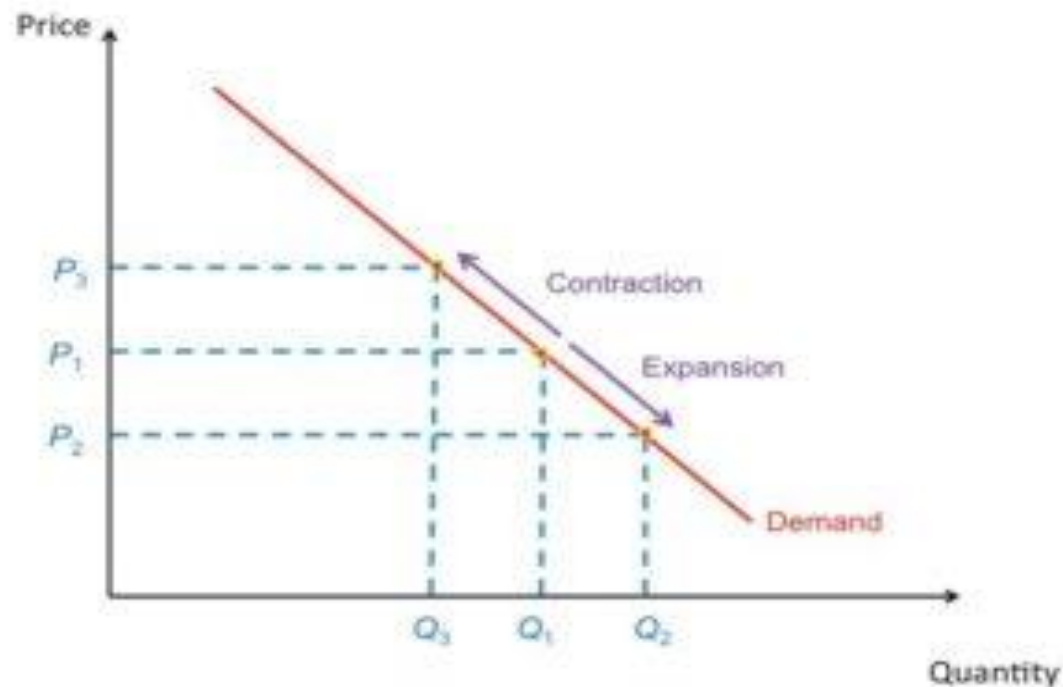
- Price

➤ **Shifts in the Demand Curve**

- Income
- Price of Related Goods (Substitute and Complementary Goods)
- Taste and Preferences
- Future Expectations of Price

Movements along the Demand Curve(also known as Change in Quantity Demanded)

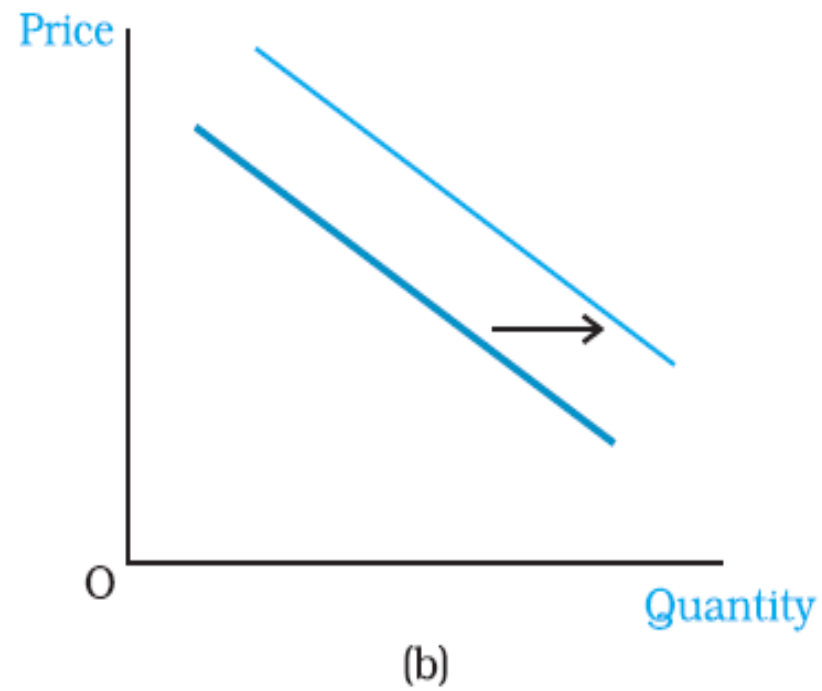
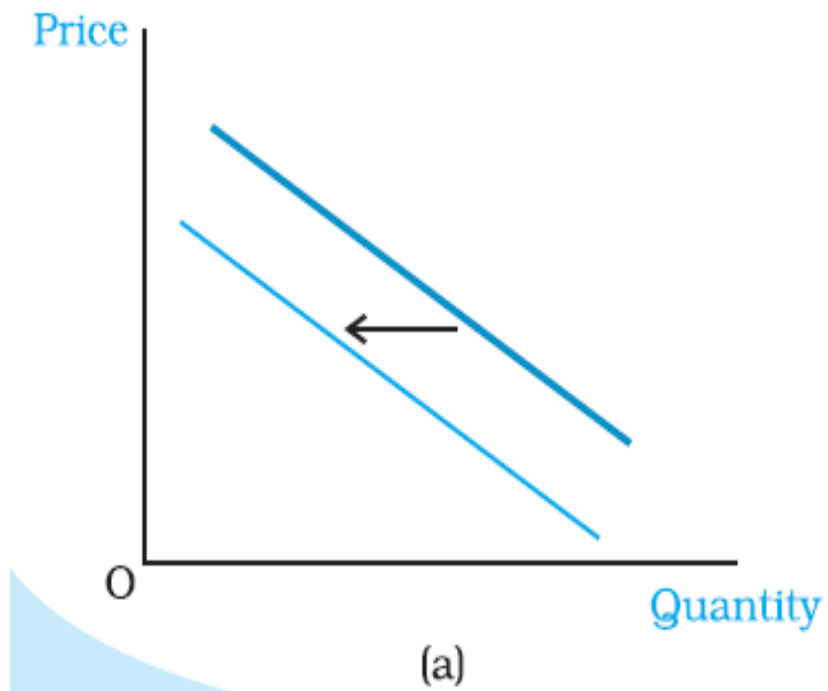
- Expansion In Demand
- Contraction in Demand



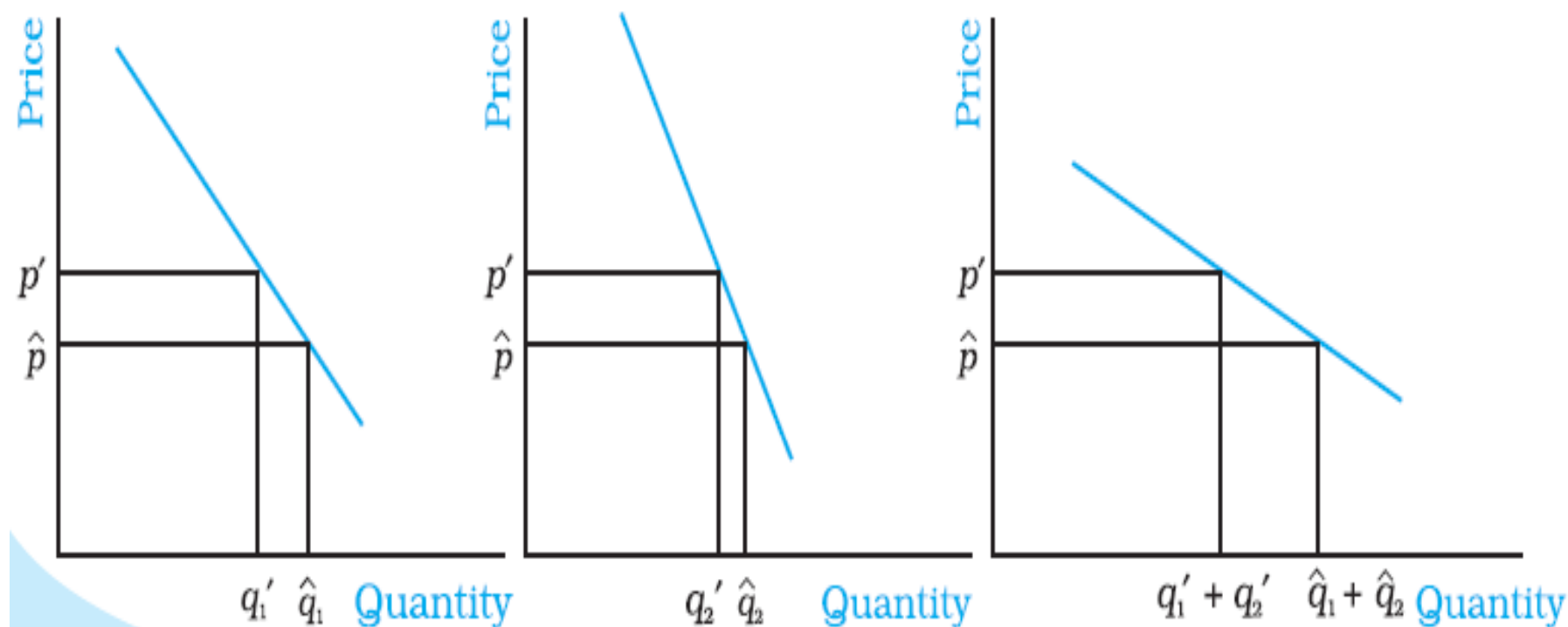
Shifts in the Demand Curve

a). Decrease in Demand

b). Increase in Demand



Derivation of the Market Demand Curve. The market demand curve can be derived as
a horizontal summation of the individual demand curves



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SUPPLY ANALYSIS

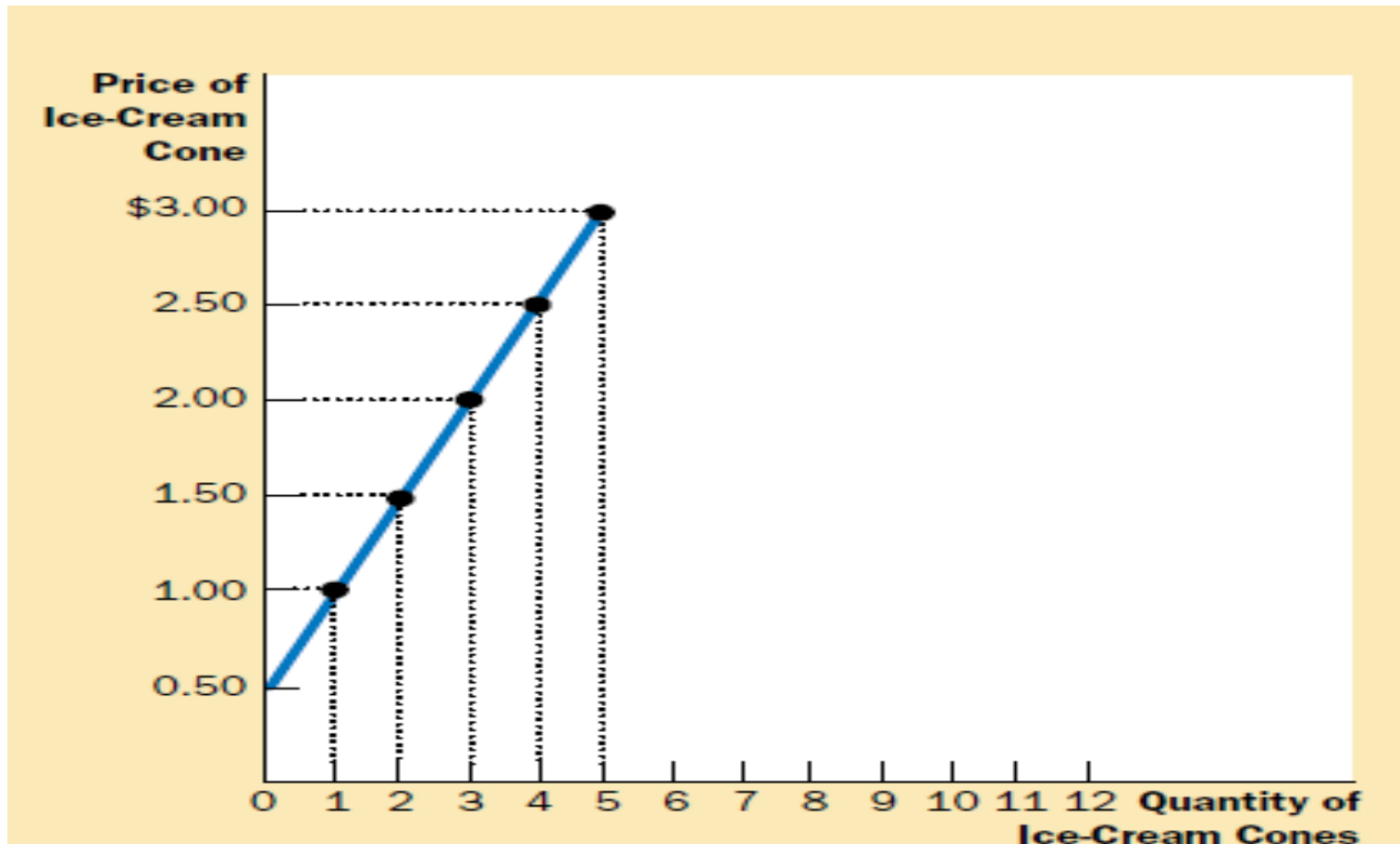
2.3

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Supply

- The quantity supplied of any good or service is the amount that sellers are willing and able to sell.
- ***Law of Supply** : other things equal, the quantity supplied of a good rises when the price of the good rises.*
- The curve relating price and quantity supplied is called the **supply curve**.

Supply Curve



Determinants of Supply

- **Price:** Increase in Price causes increase in quantity supplied.
- **Input Prices:** Increase in Input Prices causes decrease in quantity supplied.
- **Technology:** Improvement in technology causes increase in quantity supplied.
- **Government Policies**
 - Taxes: Increase in taxes causes decrease in quantity supplied.
 - Subsidies: Increase in subsidies causes increase in quantity supplied.
- **Future Expectations of Price:** If future expectations of Price increases then current supply will decrease and vice versa.

Changes in Supply Curve

➤ **Movement along Supply Curve**

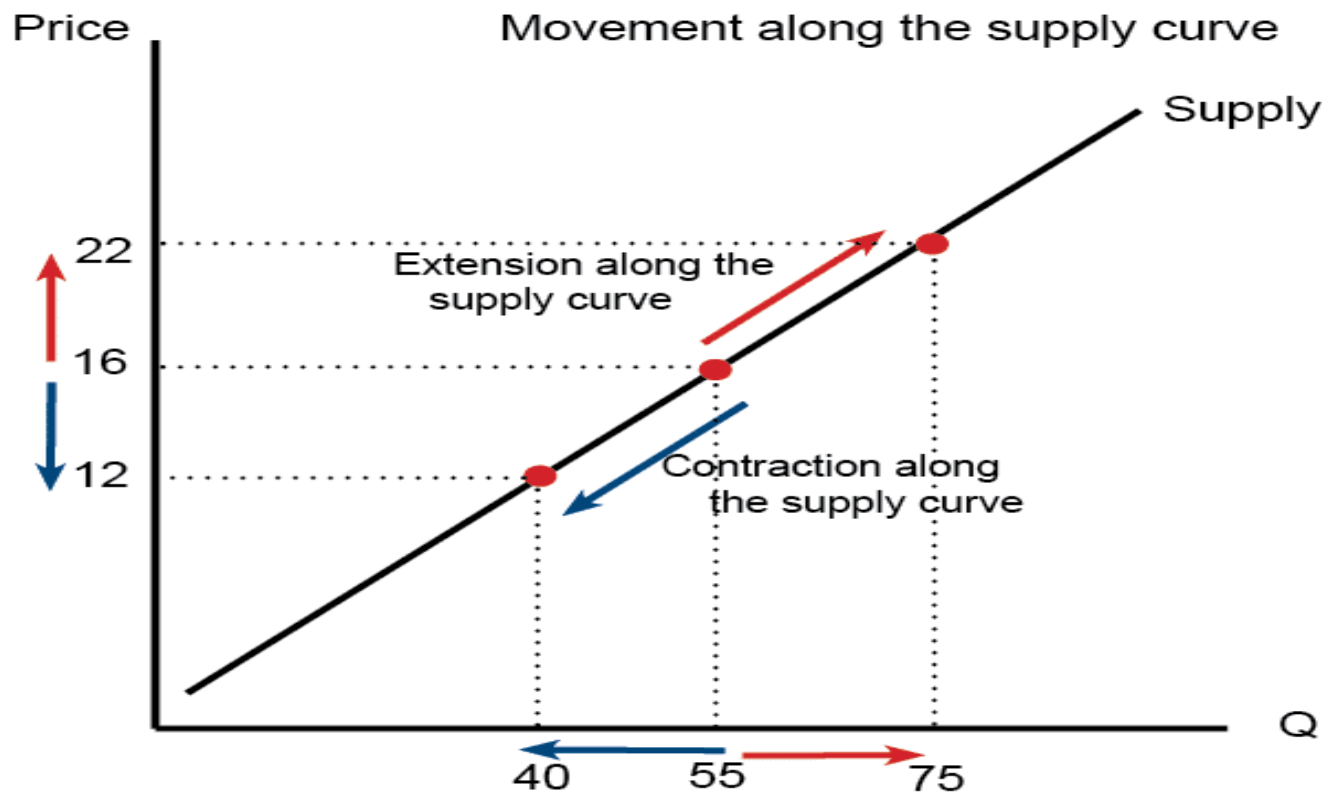
- Price

➤ **Shifts in Supply Curve**

- Input Prices
- Technology
- Government Policies
- Future Expectations of Price

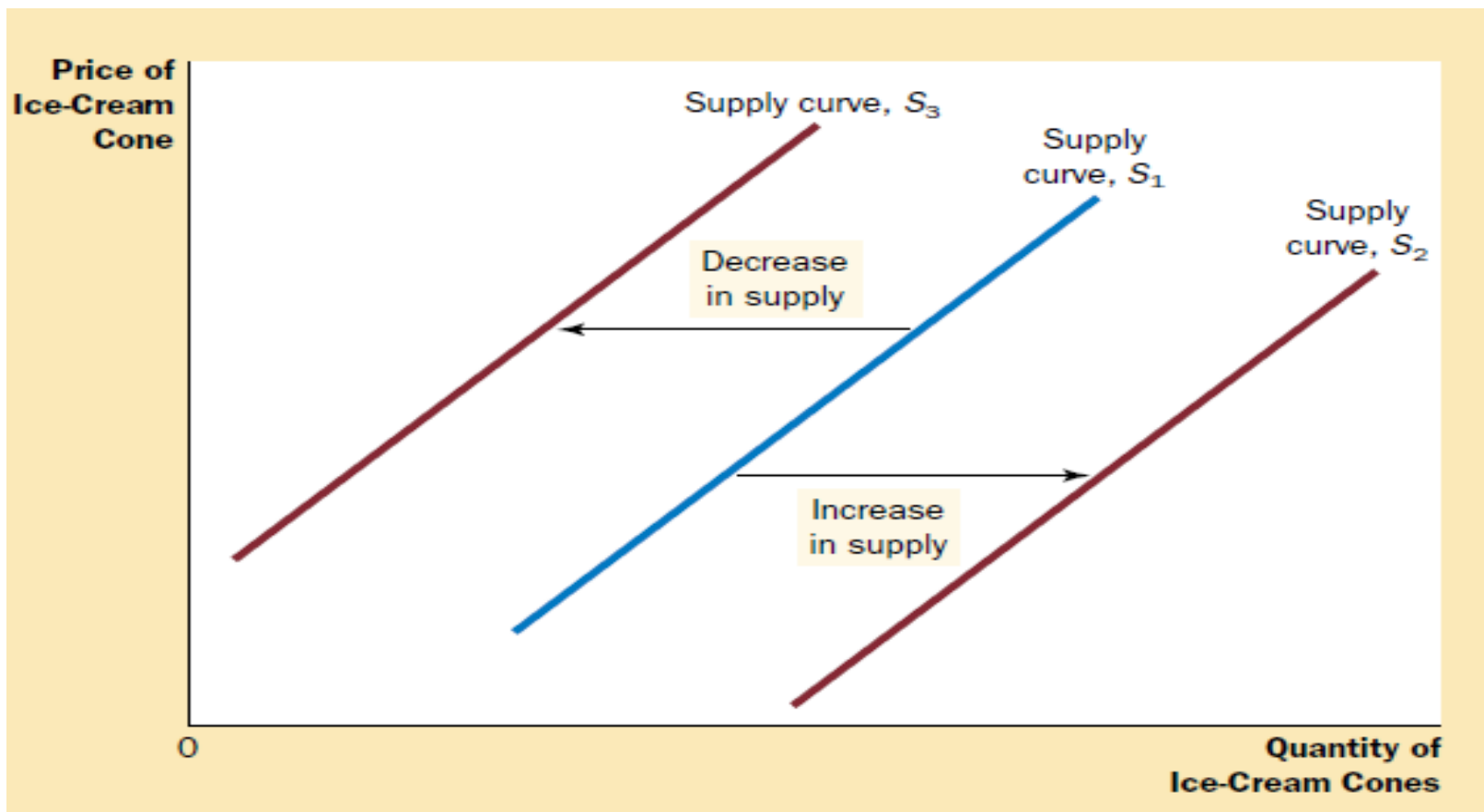
Movement along Supply Curve (also known as change in quantity supplied)

- Expansion of Supply
- Contraction of Supply

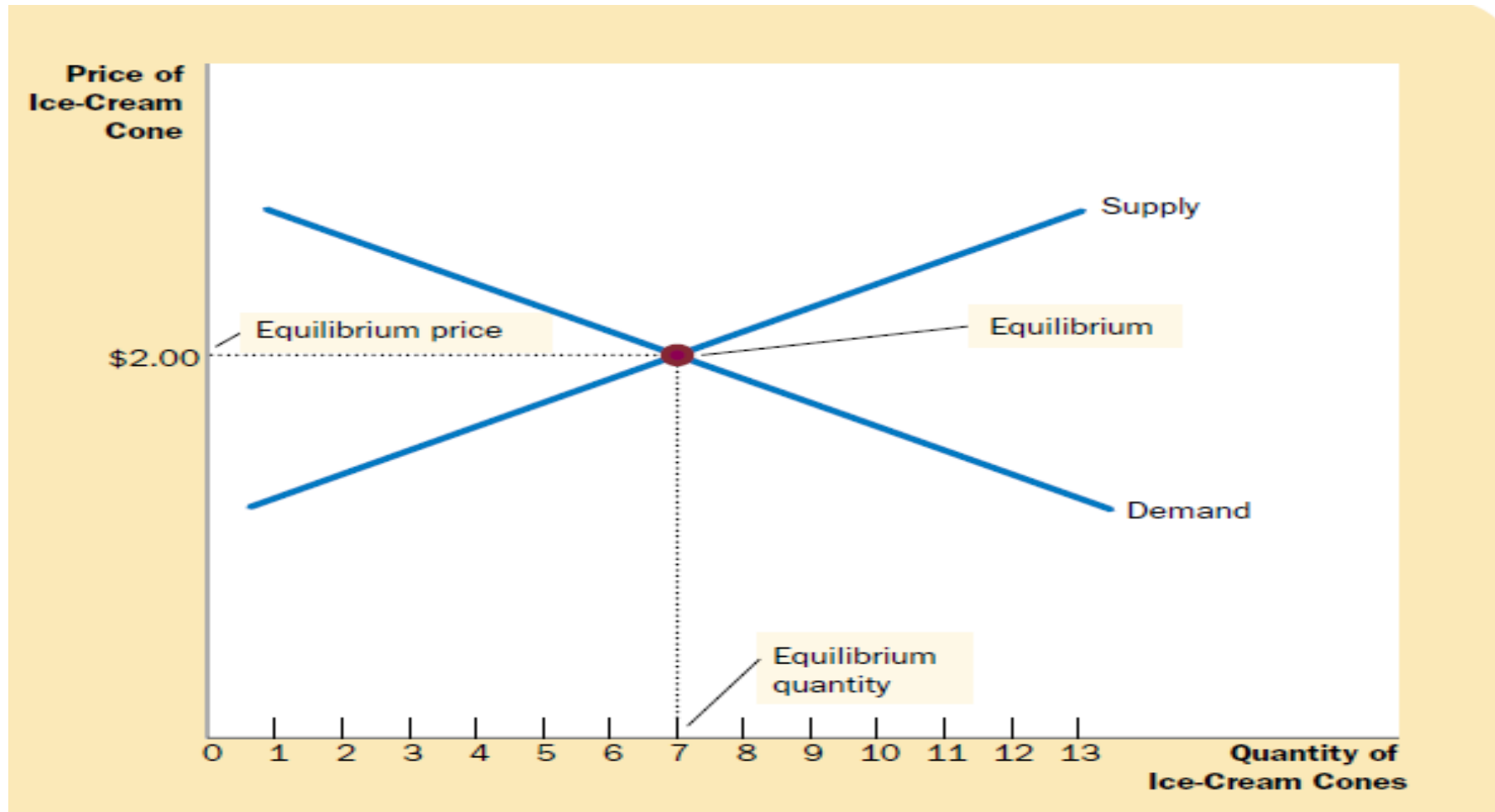


Shifts in Supply Curve

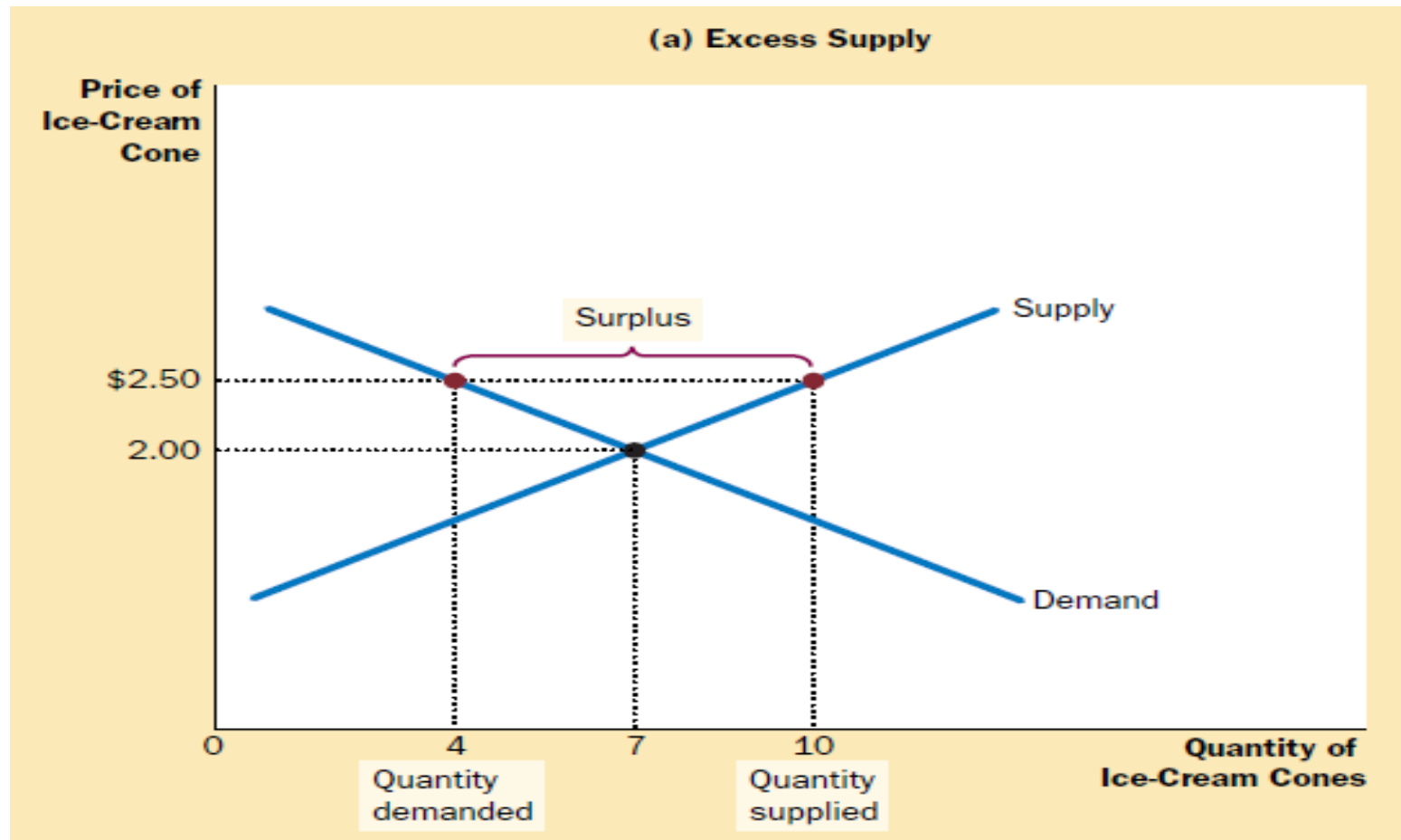
- Increase in Supply
- Decrease in Supply



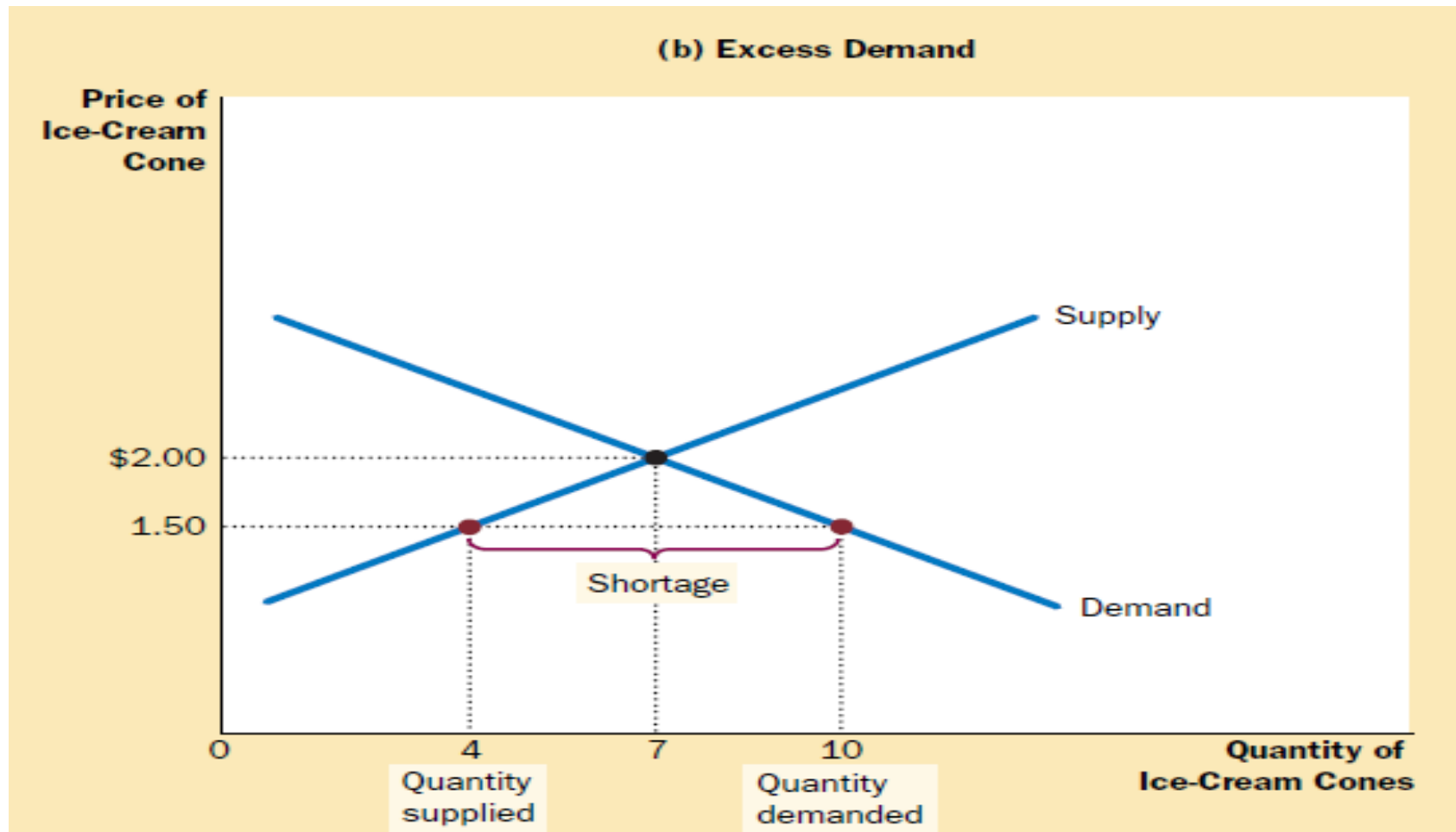
Equilibrium



Price Mechanism



Price Mechanism



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ELASTICITY OF DEMAND

2.4

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Elasticity of demand

- Elasticity of demand is a measure of the responsiveness of demand for a good to changes in other factors(Price, Income , Price of related good etc).

- Types of Elasticity of Demand
 - Price Elasticity of Demand(ed)
 - Income Elasticity of Demand (em)
 - Cross Price Elasticity of Demand (exy)

Price Elasticity of Demand

➤ Price elasticity of demand is a measure of the responsiveness of demand for a good to changes in its price.

➤ **Methods to calculate Price elasticity**

1. Percentage Method

2. Point Elasticity Method

a) Algebraic Method

b) Geometric Method

3. Arc Elasticity Method

Percentage Method

$$e_D = \frac{\text{percentage change in demand}}{\text{percentage change in the price}}$$

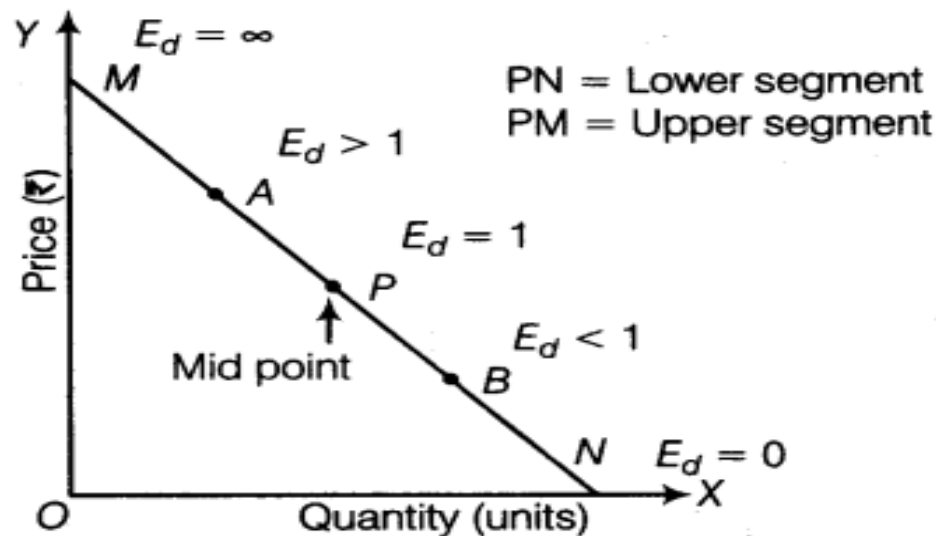
Point Elasticity Method

a) Algebraic Method

$$e_p = \frac{dQ}{dP} \cdot \frac{P}{Q}$$

b) Geometric Method

- Applicable on linear demand curve
- Formula : Elasticity = Lower Segment/Upper Segment



Arc Elasticity Method (Midpoint Method)

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

Range of price elasticity values

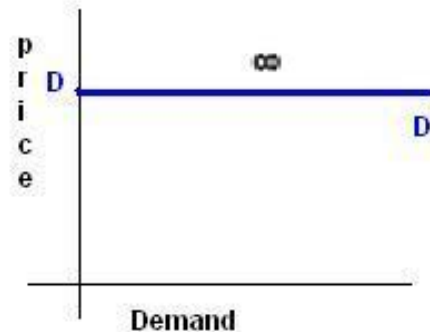
- Price elasticity of demand for normal good is negative .
- Always take modulus values of Price Elasticity

- Price elasticity ranges from 0 to infinity
 - $0 < e_d < 1$: Basic Necessities goods
 - $1 < e_d < \text{infinity}$: Luxury goods

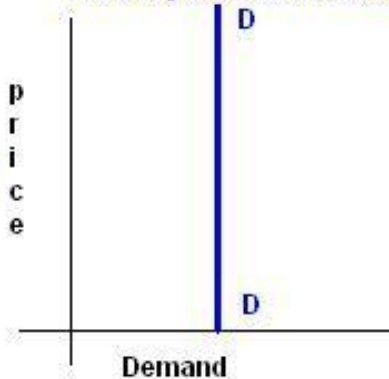
Types of price elasticity of demand

- More elastic the price elasticity of demand flatter the demand curve
- More inelastic demand curve steeper the curve
- Unitary elastic demand curve is rectangular hyperbola

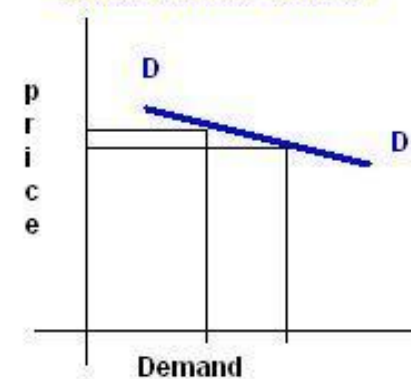
Perfectly elastic demand



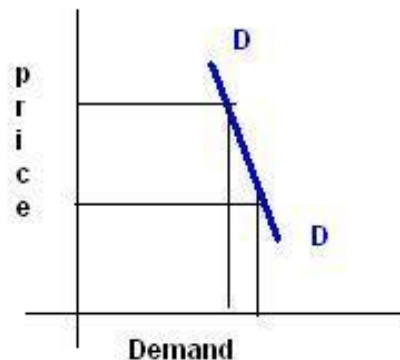
Perfectly inelastic demand



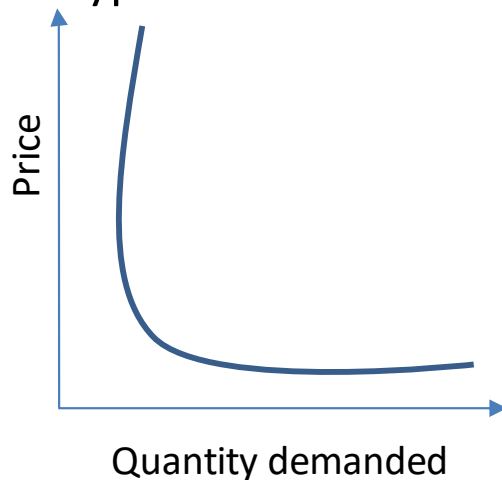
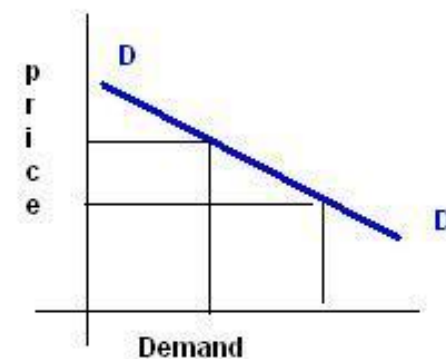
Relatively elastic demand



Relatively inelastic demand



Unity elastic demand



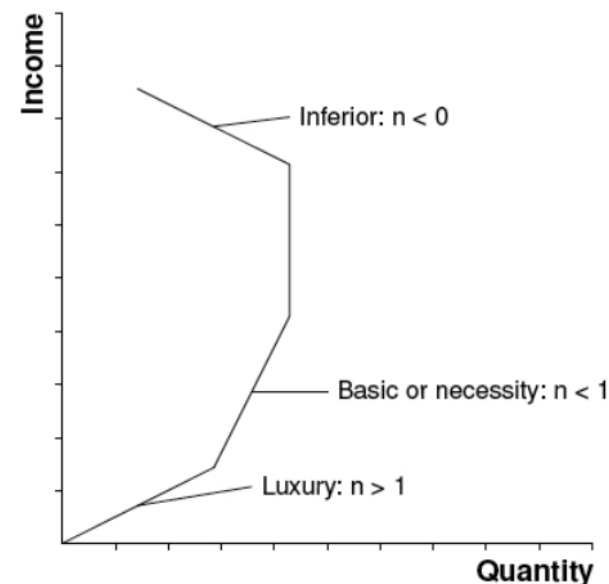
Income Elasticity of Demand

- Price elasticity of demand is a measure of the responsiveness of demand for a good to changes in its Income.

- **Methods to Calculate Income Elasticity of Demand**
 1. **Percentage Method** : See slide no. 4 . Replace price with Income(M).
 2. **Point Elasticity Method**
 - a) Algebraic Method: See slide no. 5. Replace price with Income(M)
 - b) Geometric Method: Not Applicable
 3. **Arc Elasticity Method**: See slide no. 6. Replace price with Income(M).

Range of Income elasticity values

- Income elasticity values can be positive as well as negative.
- Income Elasticity ranges from – infinity to + Infinity
 - $0 < e_m < \text{Infinity}$: Normal goods
 - $-\text{Infinity} < e_m < 0$: Inferior goods



Cross Price Elasticity of Demand

- Cross price elasticity of demand is a measure of the responsiveness of demand for good X to changes in the price of good Y.
- **Methods to Calculate Income Elasticity of Demand**
 1. **Percentage Method** : See slide no. 4 . Replace price with price of good Y . Also replace Q with quantity of X (Q_x)
 2. **Point Elasticity Method**
 - a) Algebraic Method: See slide no. 5. Replace price with price of good Y. Also replace Q with quantity of X (Q_x)
 - b) Geometric Method: Not Applicable
 3. **Arc Elasticity Method** : See slide no. 6. Replace price with price of good Y. Also replace Q with quantity of X (Q_x)

Range of cross price elasticity values

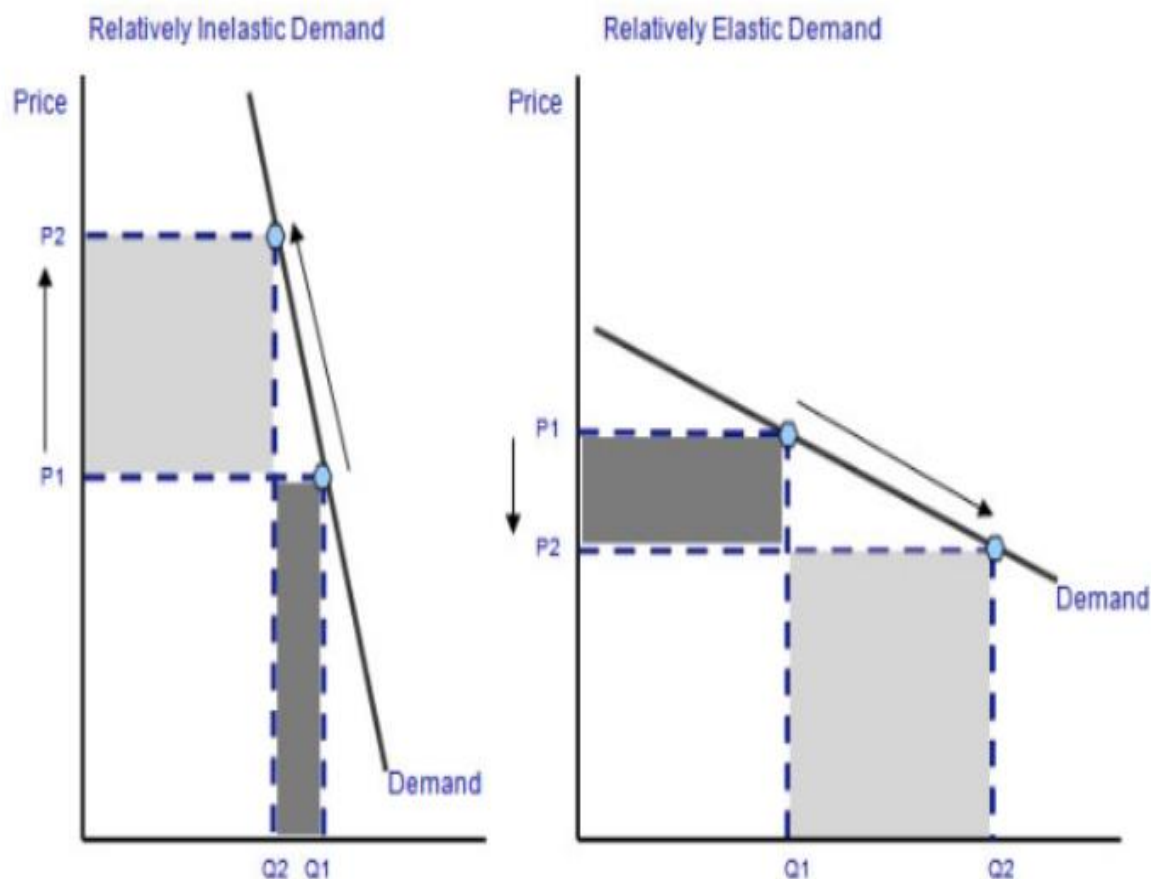
- The value of cross price elasticity can be both positive and negative.
- Cross price elasticity value ranges from $-\infty$ to $+\infty$
 - $0 < e_{xy} < \infty$: Substitute goods
 - $-\infty < e_{xy} < 0$: Complementary goods

Relationship between Total Revenue and Price Elasticity

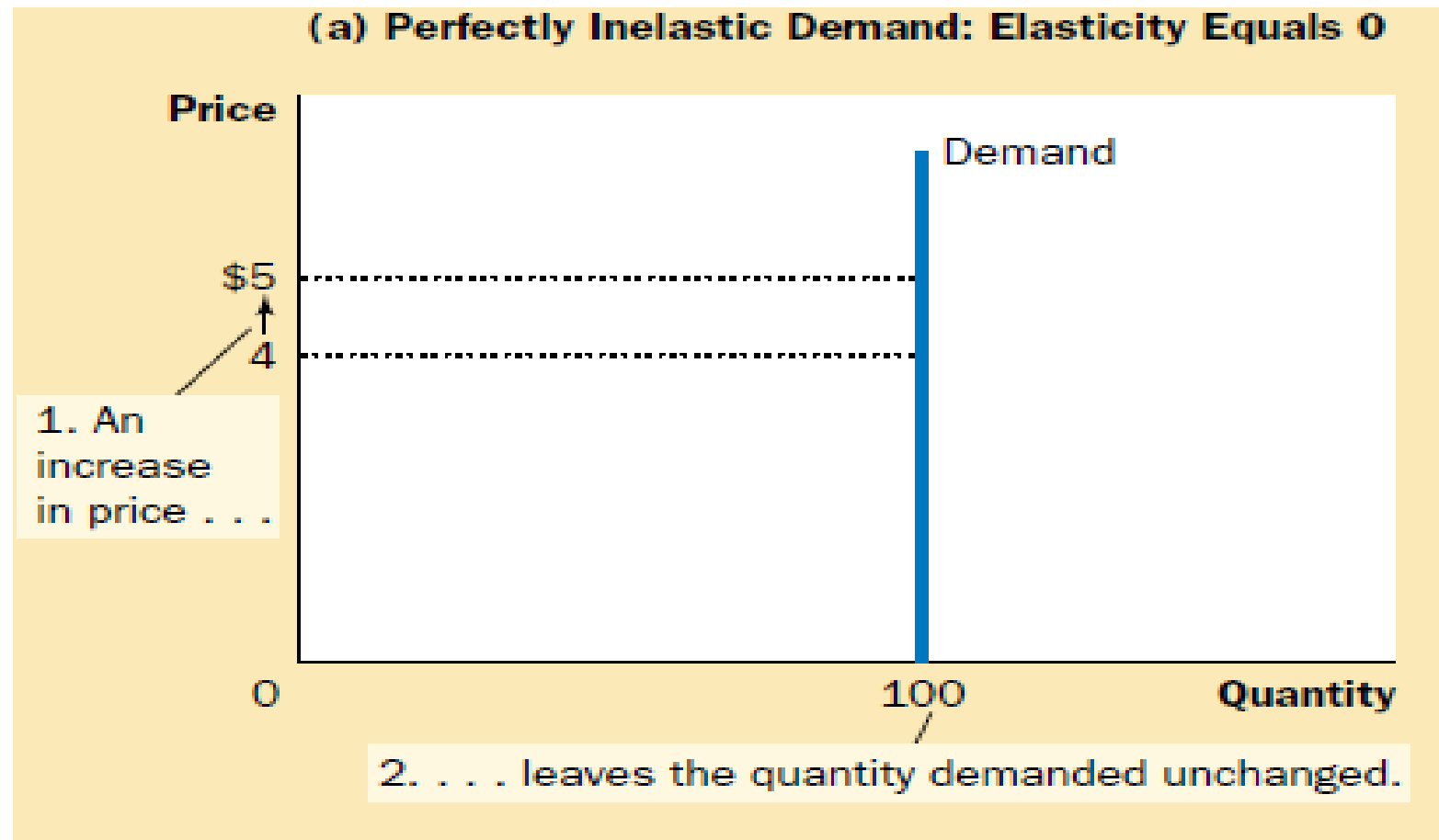
- **Total Revenue (TR):** Total collection(receipts) of money after selling the goods. The total revenue of a firm is calculated by $P \times Q$.

Price Elasticity	Price	Total Revenue	Relationship between P & TR
$0 < E_d < 1$	If Price increases If Price decreases	TR Increases TR decreases	Positive Relationship
$E_d = 1$	If Price increases If Price decreases	No Change in TR	No Relationship
$1 < E_d < \text{Infinity}$	If Price Increases If Price decreases	TR decreases TR Increases	Negative Relationship

- At $ed=1$ TR remains same
- PED can serve as a pricing policy, telling producer how to change prices to increase revenue.
- If the demand of an item is price elastic, firms should decrease price to increase revenue.
- This is because when there is a drop in price, the increase in quantity demanded is more than proportionate. Hence the producer is likely to gain more revenue since more people are buying, even though the price is slightly lower. This is usually relevant to producers selling luxury goods like branded bags and clothes, because these items are non necessity. Consumers are likely to buy them if there are drop in prices.
- If the demand of an item is price inelastic, firms should increase price to increase revenue.
- This is because when there is a rise in price, the increase in quantity demanded is more than proportionate. Hence the producer is likely to gain more revenue since more people are buying, even though the price is increase. This is usually relevant to producers selling basic necessities like food and water, because these items are necessity. Consumers are likely to buy them if there are increase in prices.
- When we compare elasticity of two goods then we compare their absolute values and ignore the negative sign.

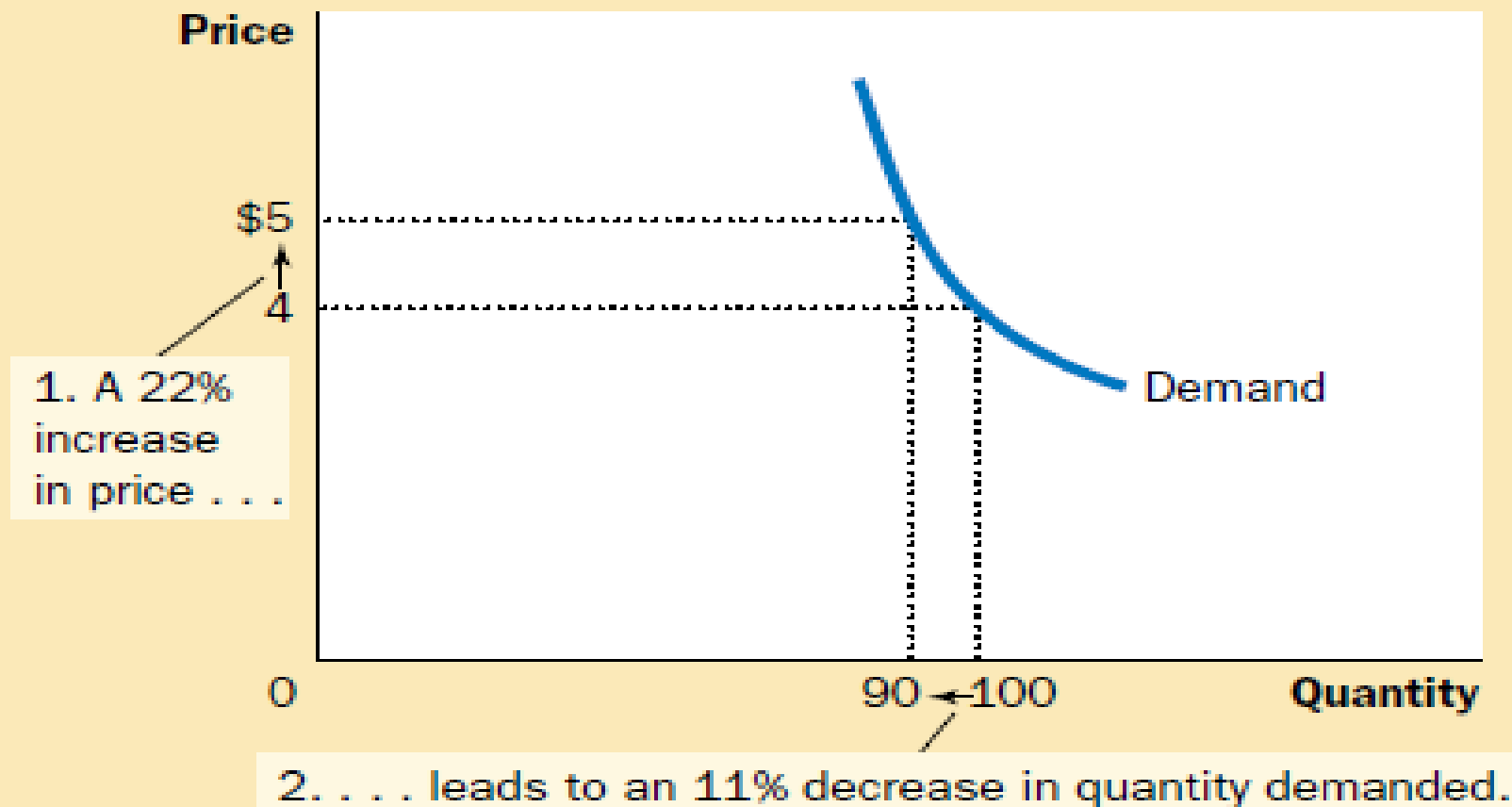


Shapes of demand curve at different values of price elasticity

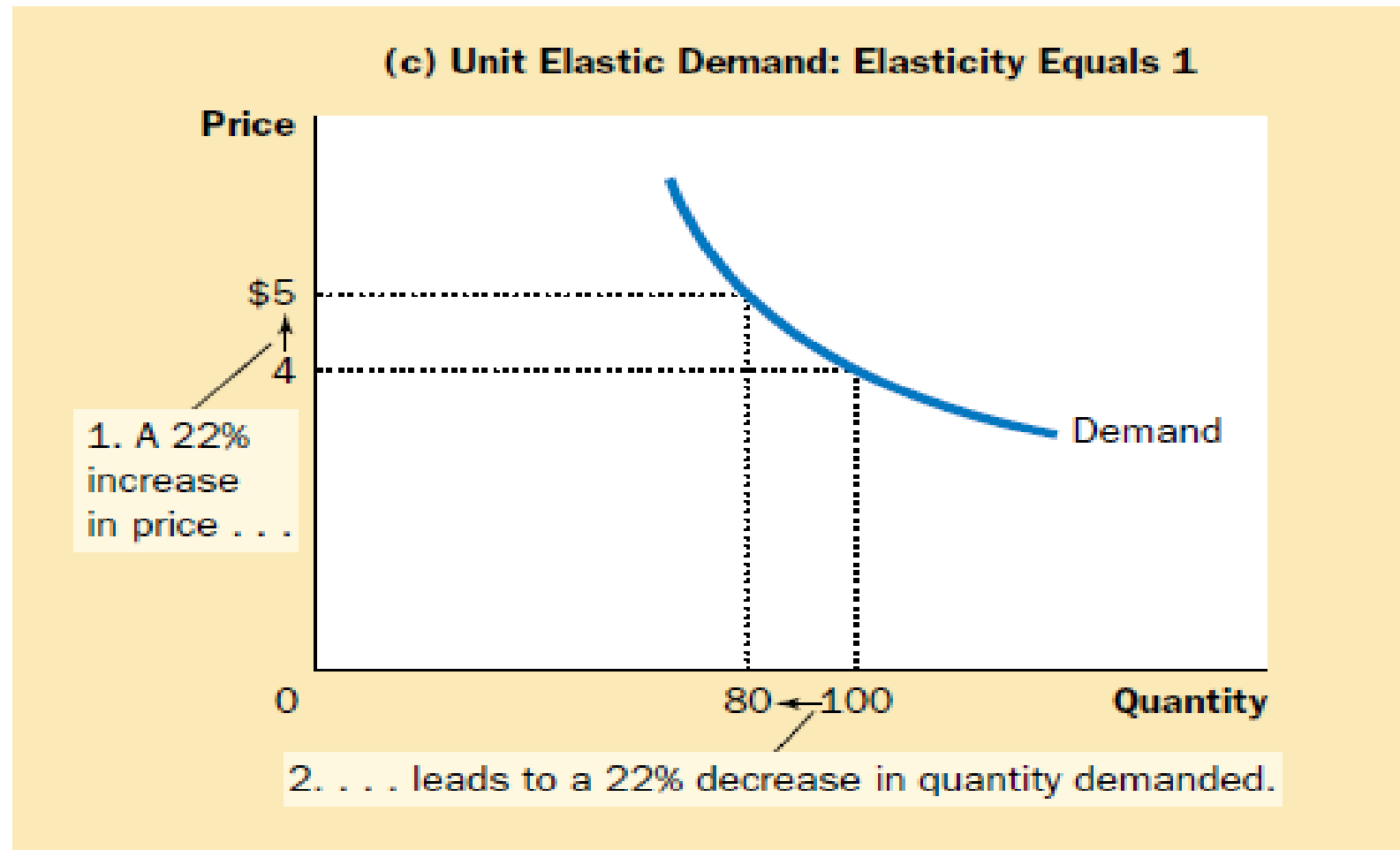


Shapes of demand curve at different values of price elasticity

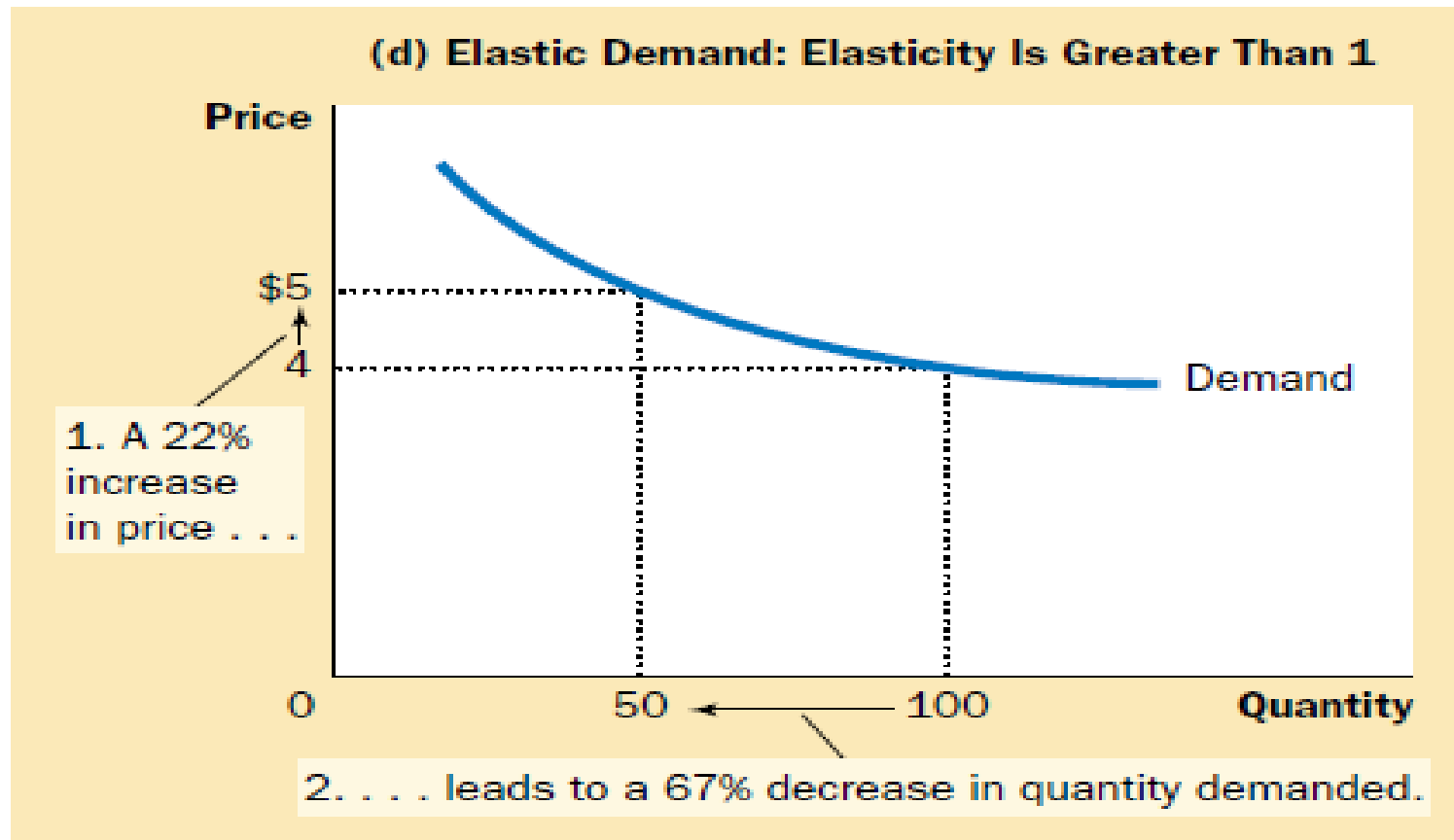
(b) Inelastic Demand: Elasticity Is Less Than 1



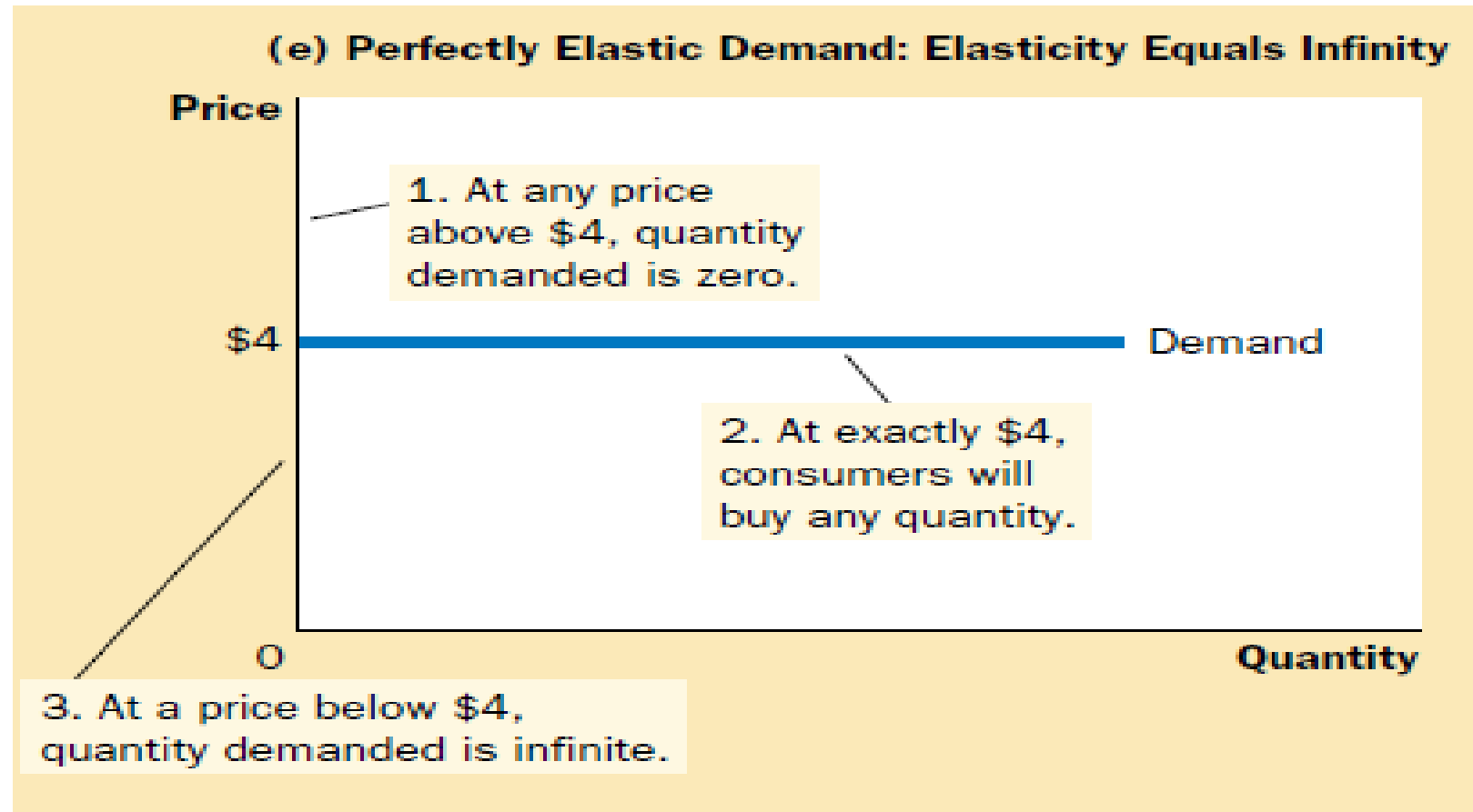
Shapes of demand curve at different values of price elasticity



Shapes of demand curve at different values of price elasticity



Shapes of demand curve at different values of price elasticity



Factors affecting Elasticity of demand

➤ **Nature of Good**

- Basic Necessity : inelastic demand
- Luxury or Superior good : elastic demand

➤ **Availability of close Substitutes**

- More Substitutes in market : more elastic demand
- Less Substitutes in market : less elastic demand

➤ **Income Level:** Higher Income levels have relatively less elastic demand

➤ **Level of price:** Costly goods have highly elastic demand.

➤ **Postponement of Consumption:** Goods which have less urgent demand have highly elastic demand . Goods with urgent demand like medicines have less elastic demand.

➤ **Number of Uses :** More the number of uses of a good more the Elasticity of Demand.

➤ **Share in Total Expenditure :** Greater the proportion of income spent on the commodity, more is the elasticity of demand for it and vice-versa.

➤ **Time Period:** Demand is generally inelastic in the short period.

Thank You

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5

Elasticity and its Application

PRINCIPLES OF
MICROECONOMICS
FOURTH EDITION

N. GREGORY MANKIW

PowerPoint® Slides
by Ron Cronovich

In this chapter, look for the answers to these questions:

- What is elasticity? What kinds of issues can elasticity help us understand?
- What is the price elasticity of demand?
How is it related to the demand curve?
How is it related to revenue & expenditure?
- What are the income and cross-price elasticities of demand?

A scenario...

You design websites for local businesses.

You charge \$200 per website, and currently sell 12 websites per month.

Your costs are rising (including the opp. cost of your time), so you're thinking of raising the price to \$250.

The law of demand says that you won't sell as many websites if you raise your price. How many fewer websites? How much will your revenue fall, or might it increase?

Elasticity

- Basic idea: Elasticity measures how much one variable responds to changes in another variable.
 - One type of elasticity measures how much demand for your websites will fall if you raise your price.
- Definition:
Elasticity of Demand is a numerical measure of the responsiveness of quantity demanded (Q^d) to one of its determinants.

Price Elasticity of Demand

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q^d}{\text{Percentage change in } P}$$

- **Price elasticity of demand** measures how much Q^d responds to a change in P .
- Loosely speaking, it measures the price-sensitivity of buyers' demand.

Price Elasticity of Demand

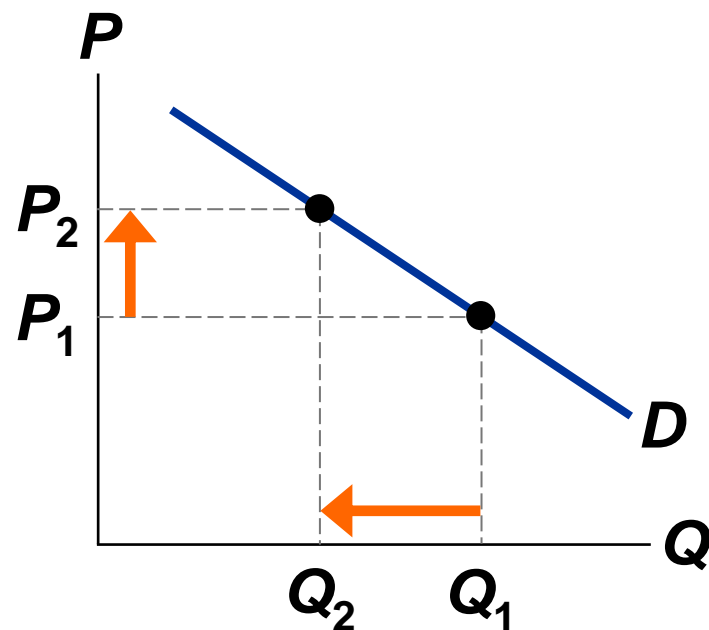
$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q^d}{\text{Percentage change in } P}$$

Example:

Price
elasticity
of demand
equals

$$\frac{15\%}{10\%} = 1.5$$

P rises
by 10%



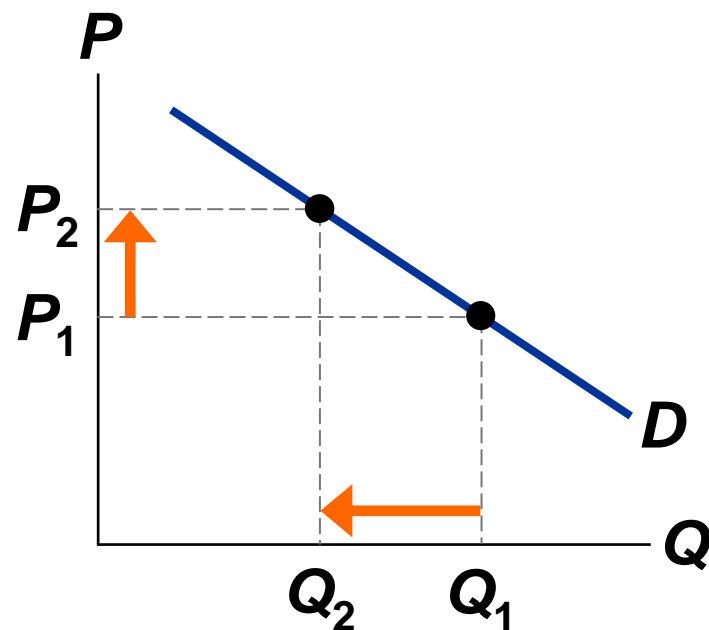
Q falls
by 15%

Price Elasticity of Demand

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q^d}{\text{Percentage change in } P}$$

Along a **D** curve, **P** and **Q** move in opposite directions, which would make price elasticity negative.

We will drop the minus sign and report all price elasticities as positive numbers.



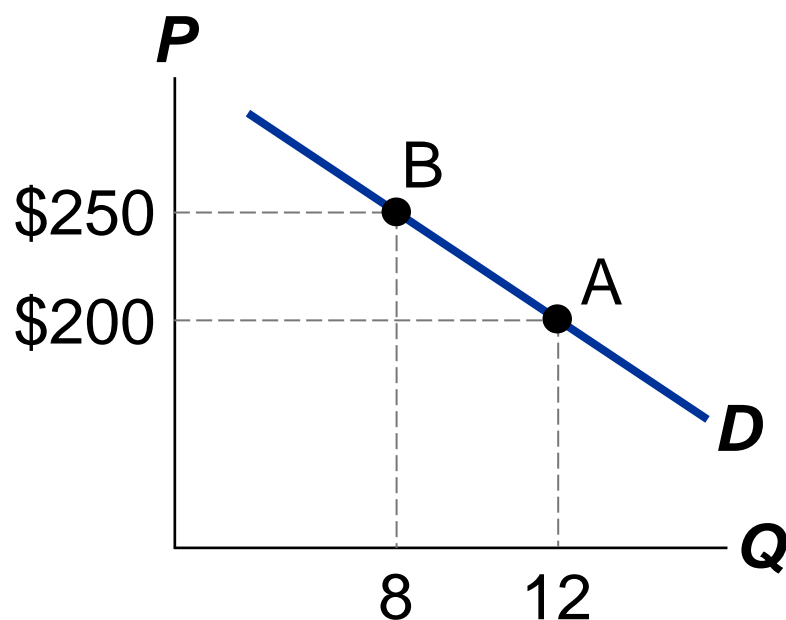
Calculating Percentage Changes

Standard method
of computing the
percentage (%) change:

$$\frac{\text{end value} - \text{start value}}{\text{start value}} \times 100\%$$

Going from A to B,
the % change in ***P*** equals
 $(\$250 - \$200) / \$200 = 25\%$

Demand for
your websites

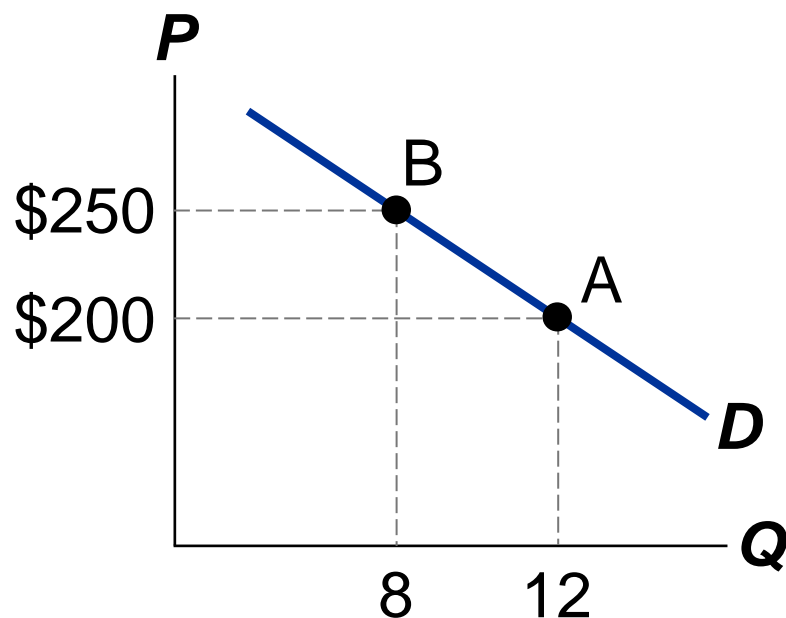


Calculating Percentage Changes

Problem:

The standard method gives different answers depending on where you start.

Demand for
your websites



From A to B,

P rises 25%, Q falls 33%,
elasticity = $33/25 = 1.33$

From B to A,

P falls 20%, Q rises 50%,
elasticity = $50/20 = 2.50$

Calculating Percentage Changes

- So, we instead use the **midpoint method**:

$$\frac{\text{end value} - \text{start value}}{\text{midpoint}} \times 100\%$$

- The midpoint is the number halfway between the start & end values, also the average of those values.
- It doesn't matter which value you use as the "start" and which as the "end" – you get the same answer either way!

Calculating Percentage Changes

- Using the midpoint method, the % change in **P** equals

$$\frac{\$250 - \$200}{\$225} \times 100\% = 22.2\%$$

- The % change in **Q** equals

$$\frac{12 - 8}{10} \times 100\% = 40.0\%$$

- The price elasticity of demand equals

$$40/22.2 = 1.8$$

ACTIVE LEARNING 1:

Calculate an elasticity

Use the following information to calculate the price elasticity of demand for hotel rooms:

if $P = \$70$, $Q^d = 5000$

if $P = \$90$, $Q^d = 3000$



ACTIVE LEARNING 1:

Answers

Use midpoint method to calculate
% change in Q^d

$$(5000 - 3000)/4000 = 50\%$$

% change in P

$$(\$90 - \$70)/\$80 = 25\%$$

The price elasticity of demand equals

$$\frac{50\%}{25\%} = 2.0$$

What determines price elasticity?

To learn the determinants of price elasticity, we look at a series of examples.

Each compares two common goods.

In each example:

- Suppose the prices of both goods rise by 20%.
- The good for which Q^d falls the most (in percent) has the highest price elasticity of demand.
Which good is it? Why?
- What lesson does the example teach us about the determinants of the price elasticity of demand?

EXAMPLE 1:

Rice Krispies vs. Sunscreen

- The prices of both of these goods rise by 20%. For which good does Q^d drop the most? Why?
 - Rice Krispies has lots of close substitutes (e.g., Cap'n Crunch, Count Chocula), so buyers can easily switch if the price rises.
 - Sunscreen has no close substitutes, so consumers would probably not buy much less if its price rises.
- Lesson: ***Price elasticity is higher when close substitutes are available.***

EXAMPLE 2:

“Blue Jeans” vs. “Clothing”

- The prices of both goods rise by 20%.
For which good does Q^d drop the most? Why?
 - For a narrowly defined good such as blue jeans, there are many substitutes (khakis, shorts, Speedos).
 - There are fewer substitutes available for broadly defined goods.
(Can you think of a substitute for clothing, other than living in a nudist colony?)
- Lesson: ***Price elasticity is higher for narrowly defined goods than broadly defined ones.***

EXAMPLE 3:

Insulin vs. Caribbean Cruises

- The prices of both of these goods rise by 20%. For which good does Q^d drop the most? Why?
 - To millions of diabetics, insulin is a necessity. A rise in its price would cause little or no decrease in demand.
 - A cruise is a luxury. If the price rises, some people will forego it.
- Lesson: ***Price elasticity is higher for luxuries than for necessities.***

EXAMPLE 4:

Gasoline in the Short Run vs. Gasoline in the Long Run

- The price of gasoline rises 20%. Does Q^d drop more in the short run or the long run? Why?
 - There's not much people can do in the short run, other than ride the bus or carpool.
 - In the long run, people can buy smaller cars or live closer to where they work.
- Lesson: ***Price elasticity is higher in the long run than the short run.***

The Determinants of Price Elasticity: A Summary

The price elasticity of demand depends on:

- the extent to which close substitutes are available
- whether the good is a necessity or a luxury
- how broadly or narrowly the good is defined
- the time horizon: elasticity is higher in the long run than the short run.

The Variety of Demand Curves

- Economists classify demand curves according to their elasticity.
- The price elasticity of demand is closely related to the slope of the demand curve.
- Rule of thumb:
The flatter the curve, the bigger the elasticity.
The steeper the curve, the smaller the elasticity.
- The next 5 slides present the different classifications, from least to most elastic.

“Perfectly inelastic demand” (one extreme case)

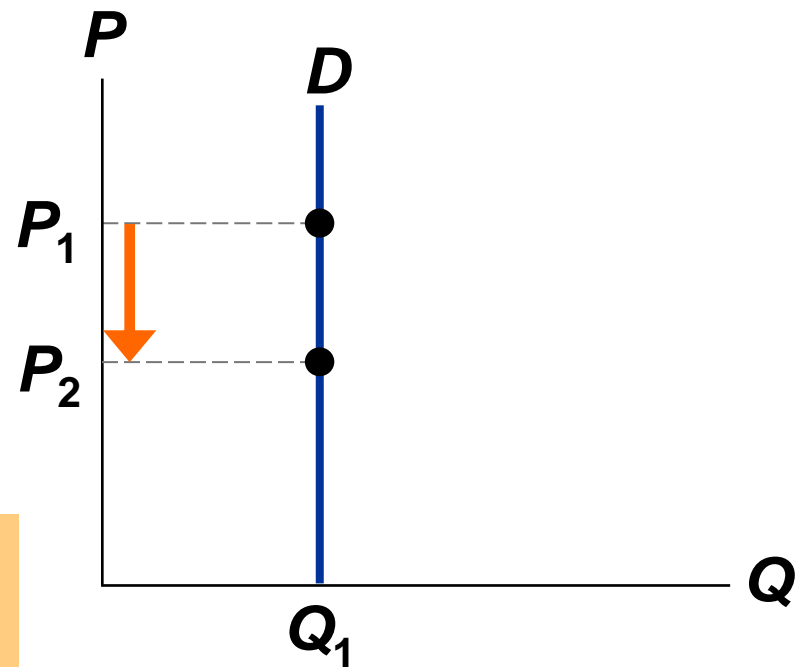
$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{0\%}{10\%} = 0$$

D curve:
vertical

Consumers’
price sensitivity:
0

Elasticity:
0

P falls
by 10%



Q changes
by 0%

"Inelastic demand"

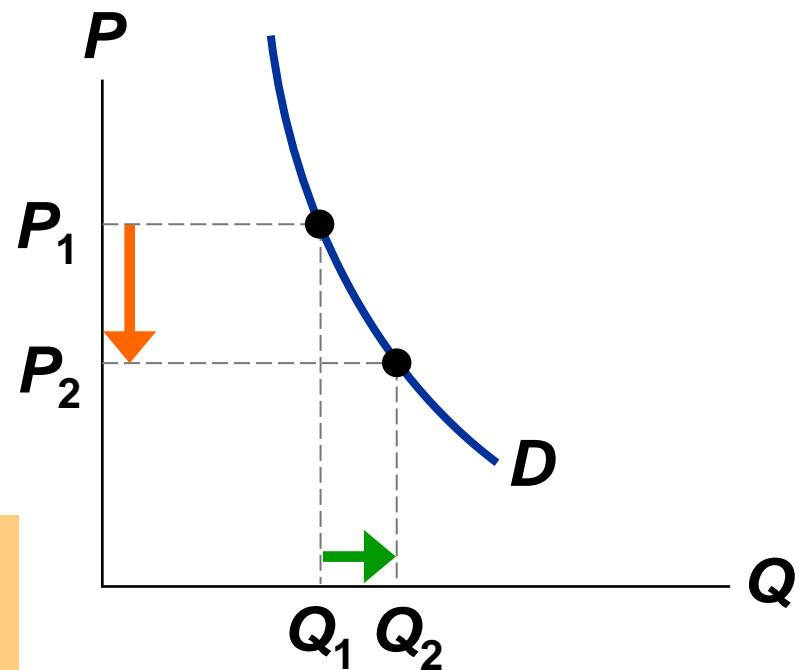
$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{< 10\%}{10\%} < 1$$

D curve:
relatively steep

Consumers'
price sensitivity:
relatively low

Elasticity:
< 1

P falls
by 10%



Q rises less
than 10%

“Unit elastic demand”

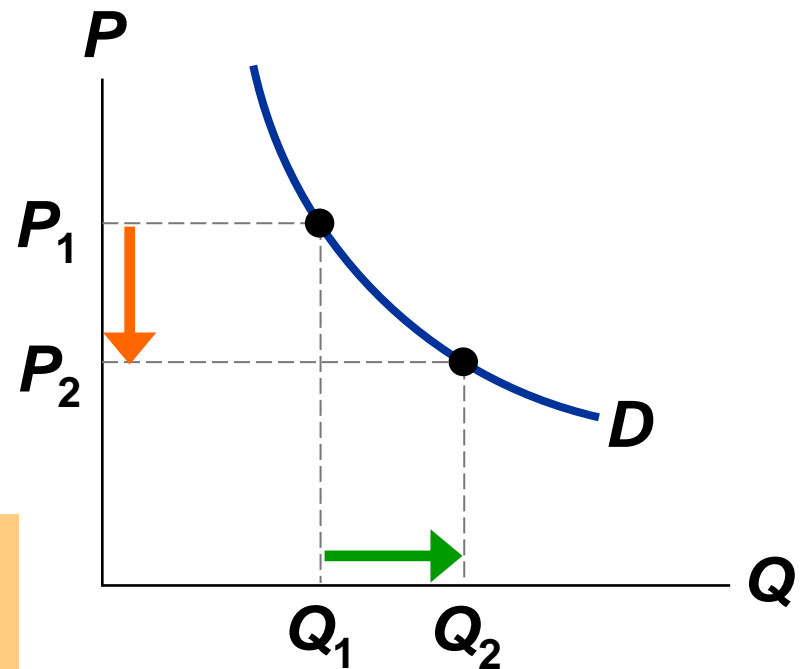
$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{10\%}{10\%} = 1$$

D curve:
intermediate slope

Consumers’
price sensitivity:
intermediate

Elasticity:
1

P falls
by 10%



Q rises by 10%

"Elastic demand"

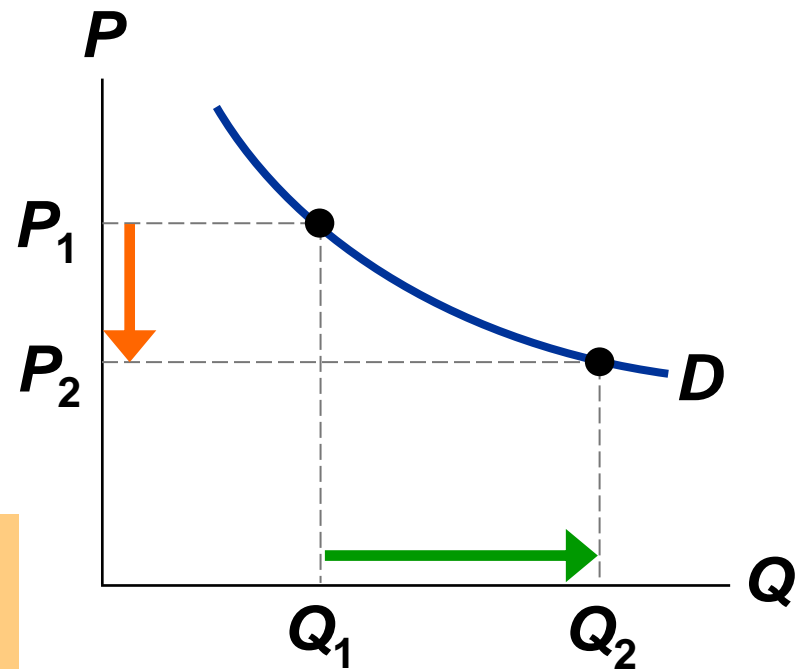
$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{> 10\%}{10\%} > 1$$

D curve:
relatively flat

Consumers'
price sensitivity:
relatively high

Elasticity:
> 1

P falls
by 10%



Q rises more
than 10%

“Perfectly elastic demand” (the other extreme)

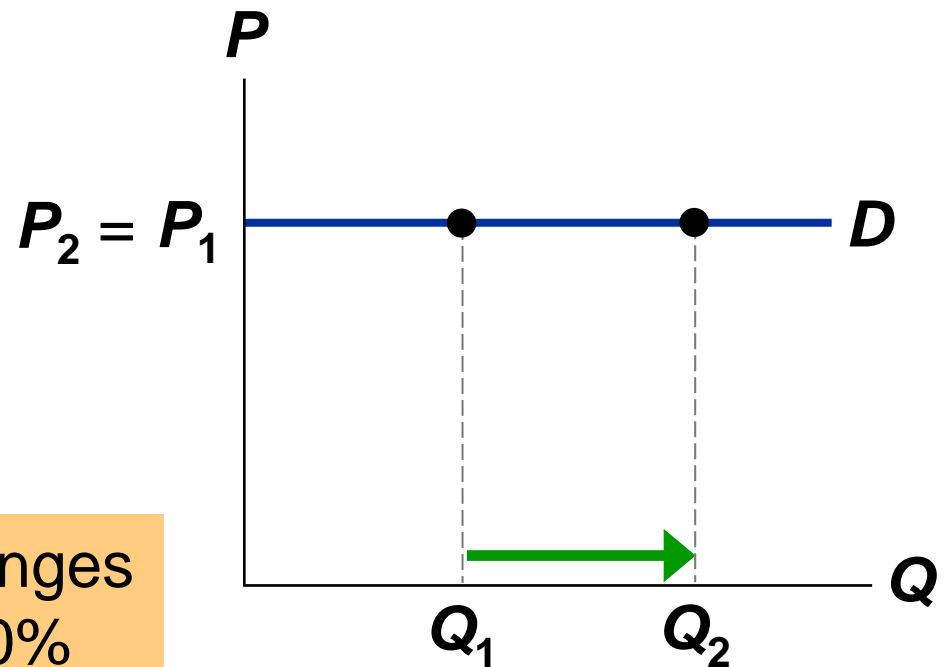
$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{\text{any } \%}{0\%} = \text{infinity}$$

D curve:
horizontal

Consumers’
price sensitivity:
extreme

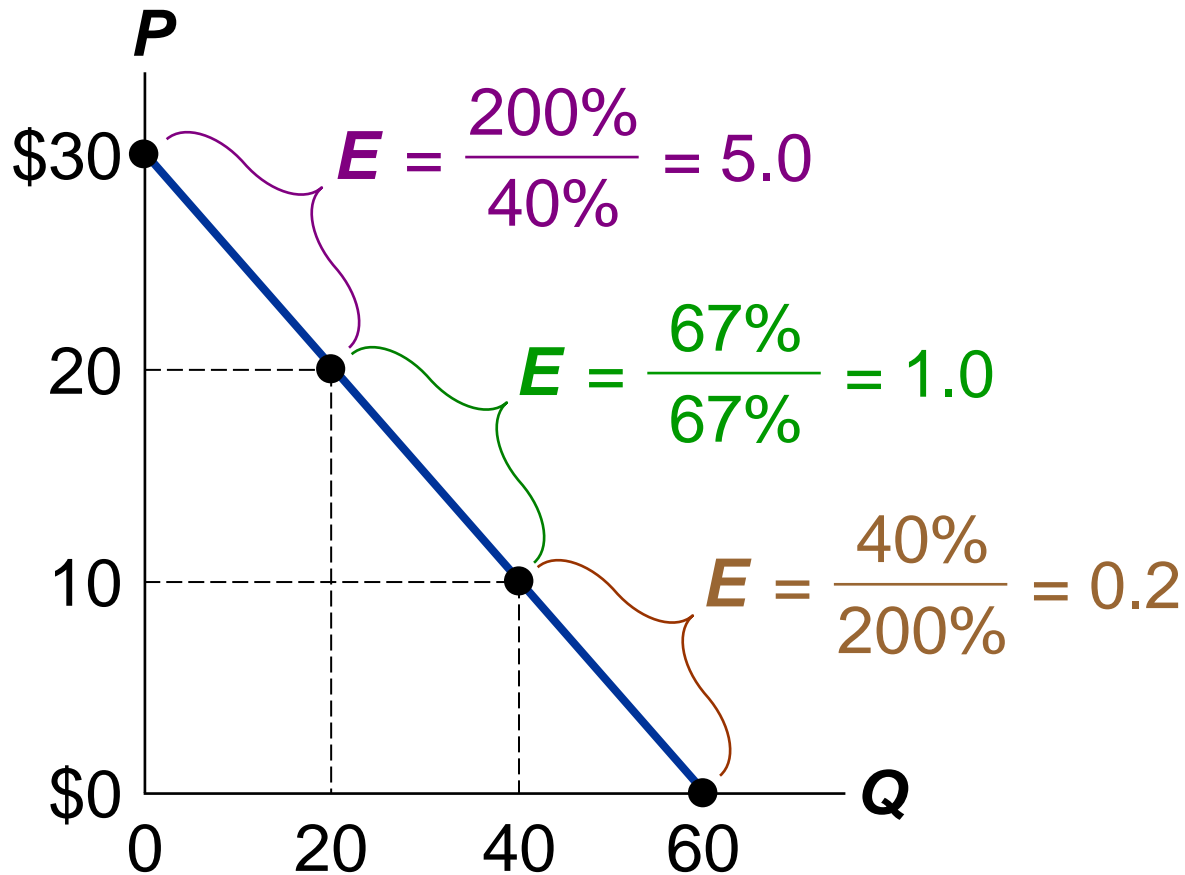
Elasticity:
infinity

P changes
by 0%



Q changes
by any %

Elasticity of a Linear Demand Curve



The slope of a linear demand curve is constant, but its elasticity is not.

The lesson here is that elasticity falls as you move downward & rightward along a linear demand curve.

Price Elasticity and Total Revenue

- Continuing our scenario, if you raise your price from \$200 to \$250, would your revenue rise or fall?

$$\text{Revenue} = P \times Q$$

- A price increase has two effects on revenue:
 - Higher ***P*** means more revenue on each unit you sell.
 - But you sell fewer units (lower ***Q***), due to Law of Demand.
- Which of these two effects is bigger?
It depends on the price elasticity of demand.

Price Elasticity and Total Revenue

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q}{\text{Percentage change in } P}$$

$$\text{Revenue} = P \times Q$$

- If demand is elastic, then
price elast. of demand > 1
 $\% \text{ change in } Q > \% \text{ change in } P$
- The fall in revenue from lower Q is greater than the increase in revenue from higher P , so revenue falls.

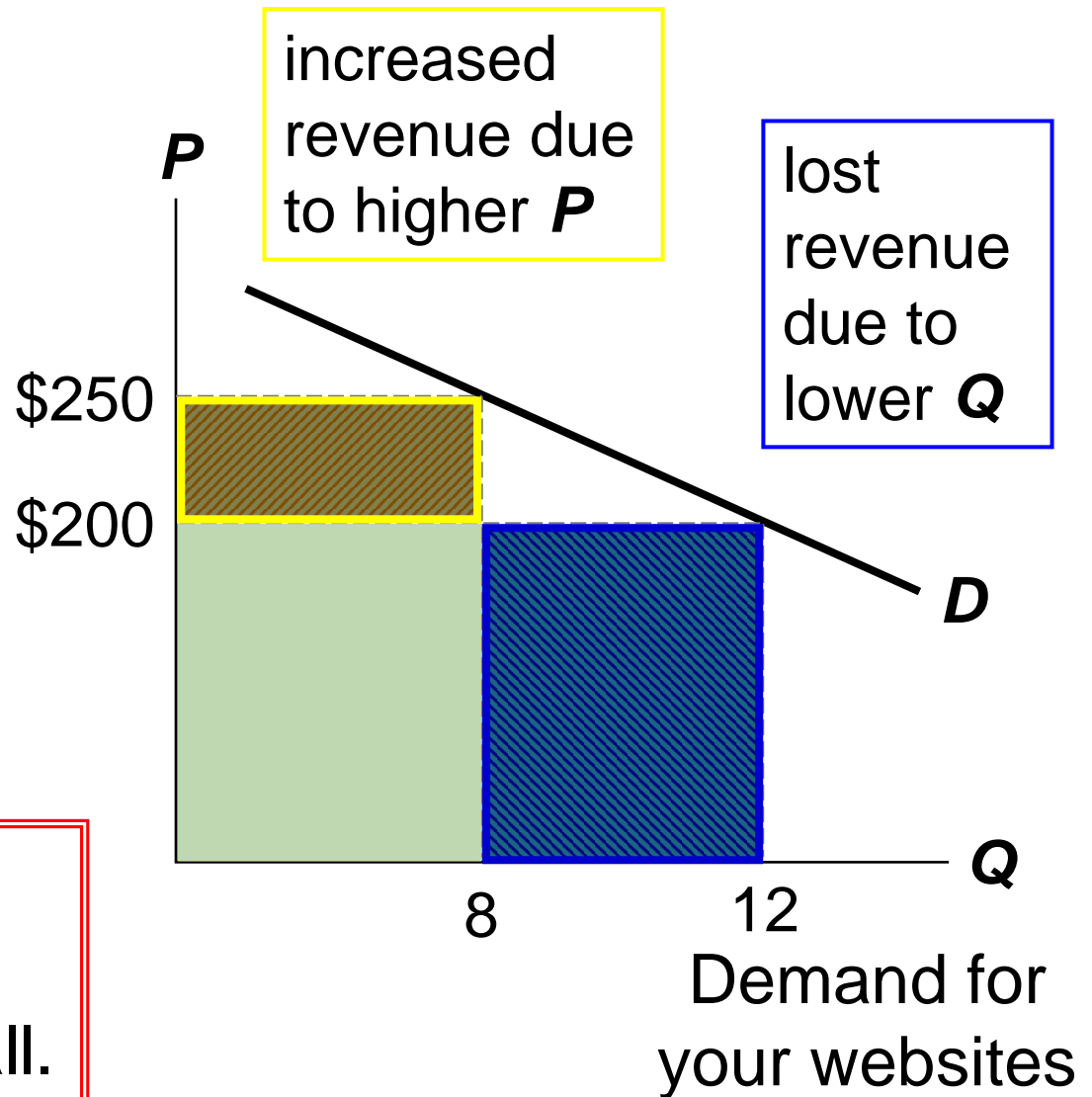
Price Elasticity and Total Revenue

Elastic demand
(elasticity = 1.8)

If $P = \$200$,
 $Q = 12$ and
revenue = \$2400.

If $P = \$250$,
 $Q = 8$ and
revenue = \$2000.

When D is elastic,
a price increase
causes revenue to fall.



Price Elasticity and Total Revenue

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q}{\text{Percentage change in } P}$$

$$\text{Revenue} = P \times Q$$

- If demand is inelastic, then
price elast. of demand < 1
 $\% \text{ change in } Q < \% \text{ change in } P$
- The fall in revenue from lower Q is smaller than the increase in revenue from higher P , so revenue rises.
- In our example, suppose that Q only falls to 10 (instead of 8) when you raise your price to \$250.

Price Elasticity and Total Revenue

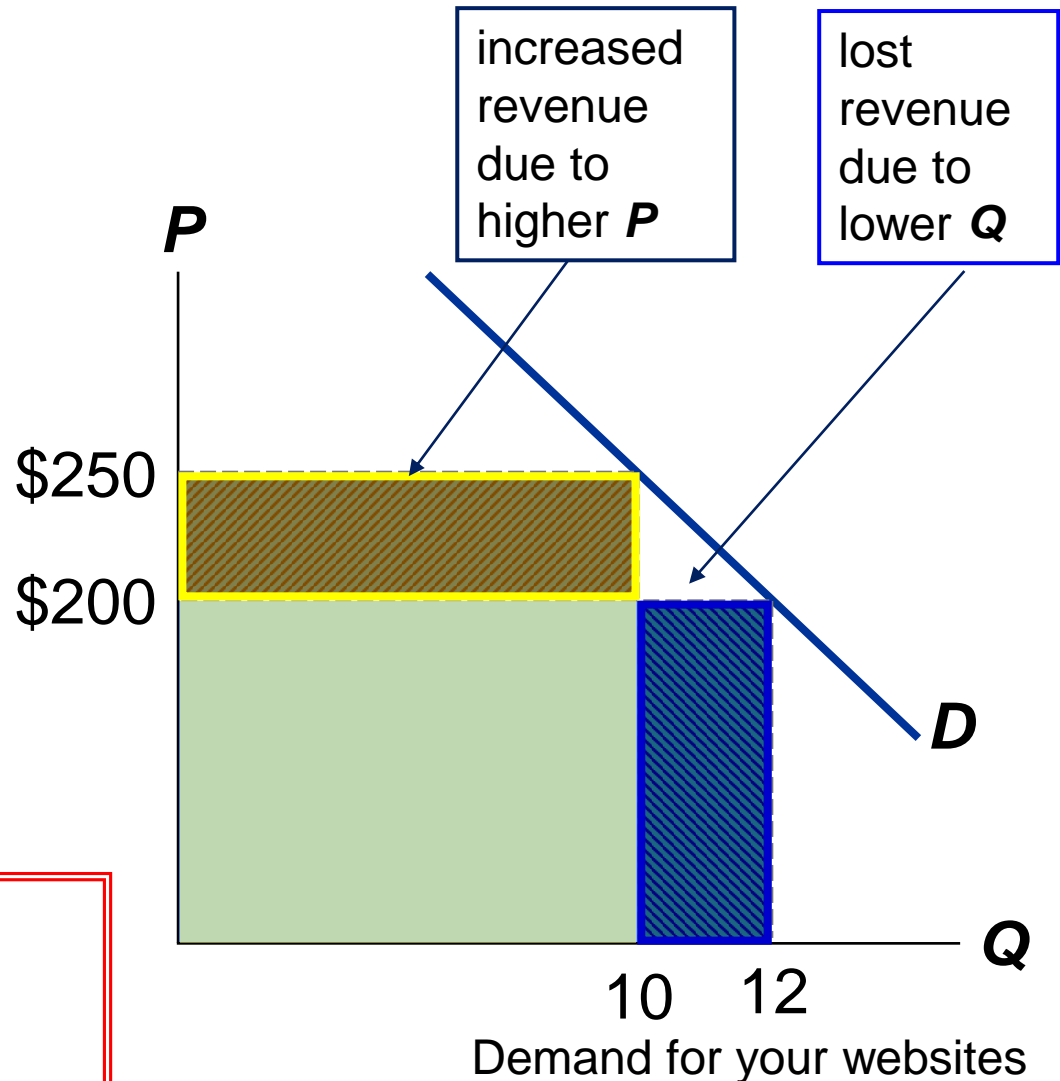
Now, demand is inelastic:

elasticity = 0.82

If $P = \$200$,
 $Q = 12$ and
revenue = \$2400.

If $P = \$250$,
 $Q = 10$ and
revenue = \$2500.

When D is inelastic,
a price increase
causes revenue to rise.



ACTIVE LEARNING 2:

Elasticity and expenditure/revenue

- A.** Pharmacies raise the price of insulin by 10%.
Does total expenditure on insulin rise or fall?
- B.** As a result of a fare war, the price of a luxury cruise falls 20%.
Does luxury cruise companies' total revenue rise or fall?

ACTIVE LEARNING 2:

Answers

- A.** Pharmacies raise the price of insulin by 10%. Does total expenditure on insulin rise or fall?

$$\text{Expenditure} = P \times Q$$

Since demand is inelastic, Q will fall less than 10%, so **expenditure rises**.

ACTIVE LEARNING 2:

Answers

B. As a result of a fare war, the price of a luxury cruise falls 20%.

Does luxury cruise companies' total revenue rise or fall?

$$\text{Revenue} = P \times Q$$

The fall in **P** reduces revenue,
but **Q** increases, which increases revenue.
Which effect is bigger?

Since demand is elastic, **Q** will increase more than 20%, so **revenue rises**.

Income elasticity of demand

- The **income elasticity of demand** measures the response of Q^d to a change in consumer income.

$$\text{Income elasticity of demand} = \frac{\text{Percent change in } Q^d}{\text{Percent change in income}}$$

- Recall from chap.4: An increase in income causes an increase in demand for a *normal* good.
- Hence, for normal goods, income elasticity > 0 .
- For *inferior* goods, income elasticity < 0 .

Cross-price elasticity of demand

- The **cross-price elasticity of demand** measures the response of demand for one good to changes in the price of another good.

$$\text{Cross-price elast. of demand} = \frac{\% \text{ change in } Q^d \text{ for good 1}}{\% \text{ change in price of good 2}}$$

- For substitutes, cross-price elasticity > 0
E.g., an increase in price of beef causes an increase in demand for chicken.
- For complements, cross-price elasticity < 0
E.g., an increase in price of computers causes decrease in demand for software.

CHAPTER SUMMARY

- Elasticity measures the responsiveness of Q^d or Q^s to one of its determinants.
- Price elasticity of demand equals percentage change Q^d in divided by percentage change in P . When it's less than one, demand is “inelastic.” When greater than one, demand is “elastic.”
- When demand is inelastic, total revenue rises when price rises. When demand is elastic, total revenue falls when price rises.

CHAPTER SUMMARY

- Demand is less elastic in the short run, for necessities, for broadly defined goods, or for goods with few close substitutes.
- The income elasticity of demand measures how much quantity demanded responds to changes in buyers' incomes.
- The cross-price elasticity of demand measures how much demand for one good responds to changes in the price of another good.
-



BuddhaDoodles

"If everything around you seems
dark, look again,
you may be the light."
- Rumi

