

Chapter 3: ELASTICITY

Elasticity of Demand

1. What is price elasticity of demand?

It is a measure of the responsiveness of the change in quantity demanded to a change in price level, when all other influences on buying plans remain the same

$$\text{Price elasticity of demand} = \% \Delta Q_d / \% \Delta P$$

$$\% \Delta Q_d = \Delta Q_d / Q_d.\text{average}$$

$$\% \Delta P = \Delta P / P \text{ average}$$

Example:

Using the following data Using the mid -point formula to get elasticities

Price	Qd
20.5	9
19.5	11

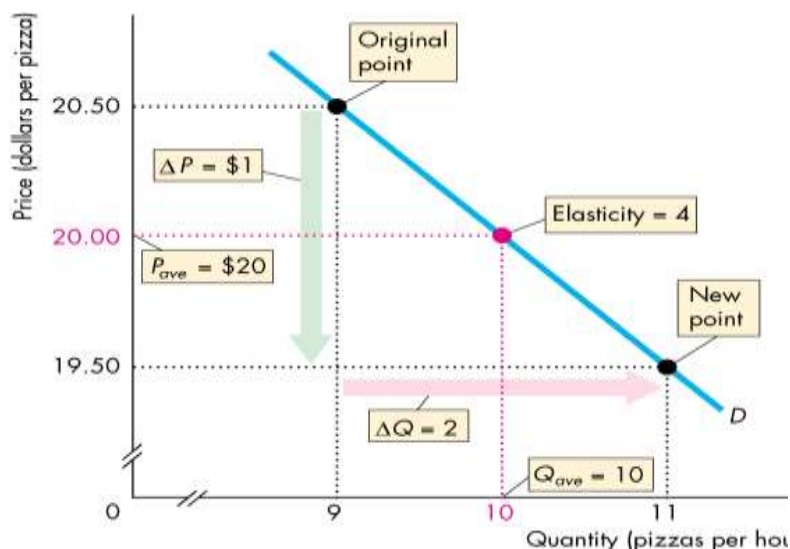
ΔQ_d	Qd-average	$\% \Delta Q_d$
2	$(9+11)/2 = 10$	$\Delta Q_d / Q_d\text{-average} * 100$ $= 20\%$

ΔP	P-average	$\% \Delta P$
1	$(20.5+19.5)/2 = 20$	$\Delta P / P\text{-average} * 100$ $= 5\%$

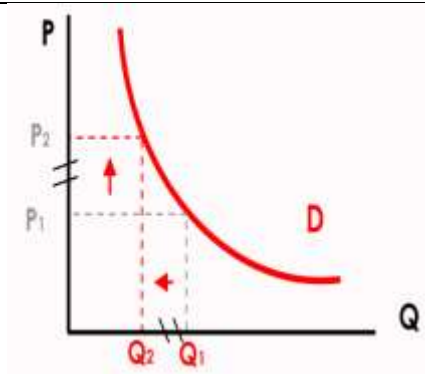
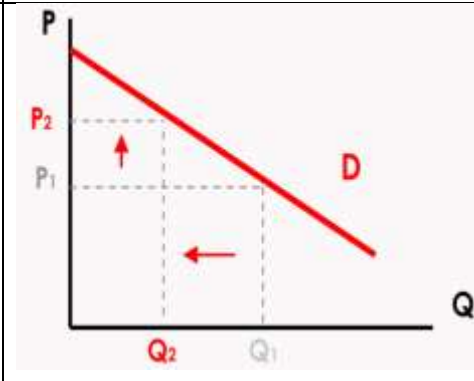
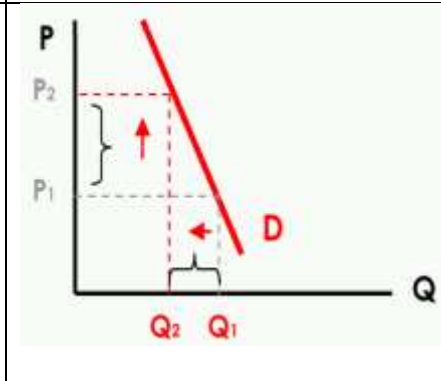
$$\text{Price elasticity of demand} = \left| \% \Delta Q_d / \% \Delta P \right| = \left| 20\% / 5\% \right| = 4$$

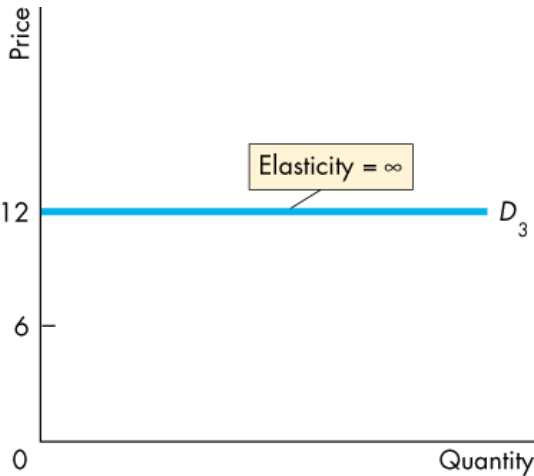
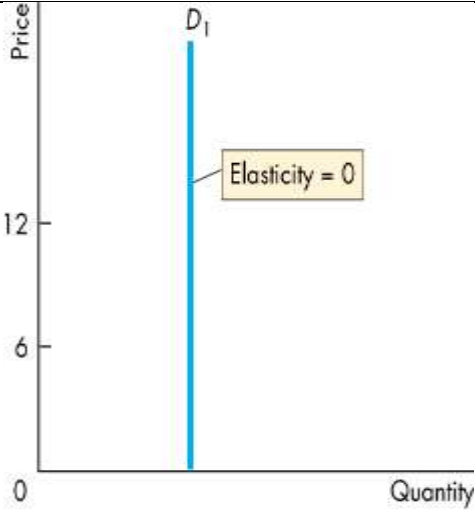
The formula yields a negative value,

- because price and quantity move in opposite directions.



2. What are types of price elasticity of demand? 5 Types

1) Unit Elastic	2) Elastic demand	3) Inelastic demand
If the price changes by 1%, quantity demanded will change by 1% at opposite direction <u>$\% \Delta Q_d = \% \Delta P$</u>	If the price changes by 1%, quantity demanded will change by More than 1% at opposite direction <u>$\% \Delta Q_d > \% \Delta P$</u>	If the price changes by 1%, quantity demanded will change by Less than 1% at opposite direction <u>$\% \Delta Q_d < \% \Delta P$</u>
the price elasticity of demand is constant = 1 <u>$E_d = 1$</u>	<u>$E_d > 1$</u>	<u>$0 < E_d < 1$</u>
		
	Luxury goods	Necessary Goods → Bread The quantity demanded is not greatly affected by the change in price level

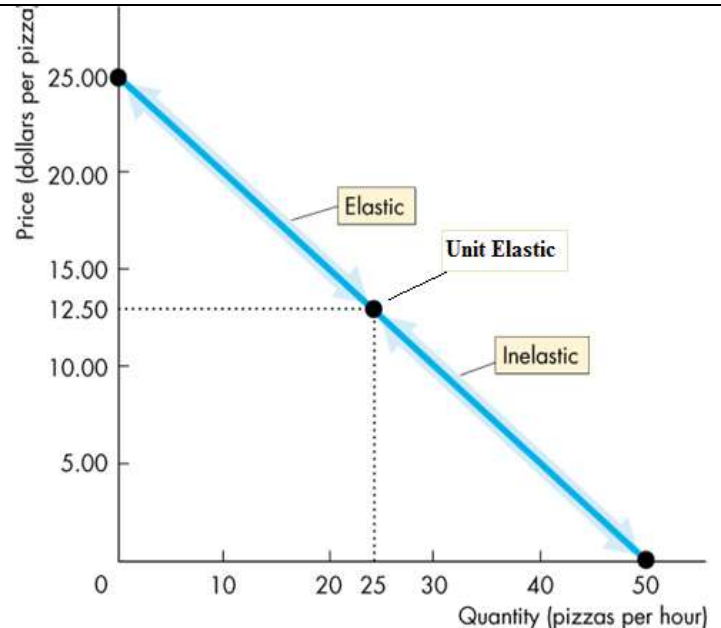
4) Perfectly Elastic demand	5) Perfectly inelastic demand
If the price changes by 1%, quantity demanded will change <u>infinitely large</u> at opposite direction	If the price changes by 1%, quantity demanded will <u>not change</u>
the price elasticity of demand is constant = ∞ $Ed = \infty$	$Ed = 0$
 Price 12 6 0 Quantity D_3 Elasticity = ∞	 Price 12 6 0 Quantity D_1 Elasticity = 0
(c) Perfectly elastic demand	(a) Perfectly inelastic demand
Any homogenous products with many substitutes as: Potatoes, vegetables Any increase in the price will cause $Q_d \downarrow = \text{zero}$	Lifesaving drug Any increase in the price will not affect Q_d of drugs

3. Show how Price elasticity varies along a linear demand curve.

At prices **above** the mid-point of the demand curve, **demand is elastic**.

At the mid-point of the demand curve, demand is **Unit elastic**.

At prices **below** the mid-point of the demand curve, **demand is inelastic**



4. List Factors That Influence the Elasticity of Demand

1) The closeness of substitutes (+VE)

- **The closer / many the substitutes** for a good or service → the **more elastic** are the demand for the good or service → **Luxuries**, such as exotic vacations
- **The Fewer the substitutes** for a good or service → **Inelastic** demand for the good or service → **Necessities**, such as food or housing

2) Proportion of Income Spent on the Good (+VE)

- The greater the proportion of income consumers spend on a good, the larger is the elasticity of demand for that good.

3) Time Elapsed Since Price Change (+VE)

- The more time consumers have to adjust to a price change, or the longer that a good can be stored without losing its value, the more elastic is the demand for that good

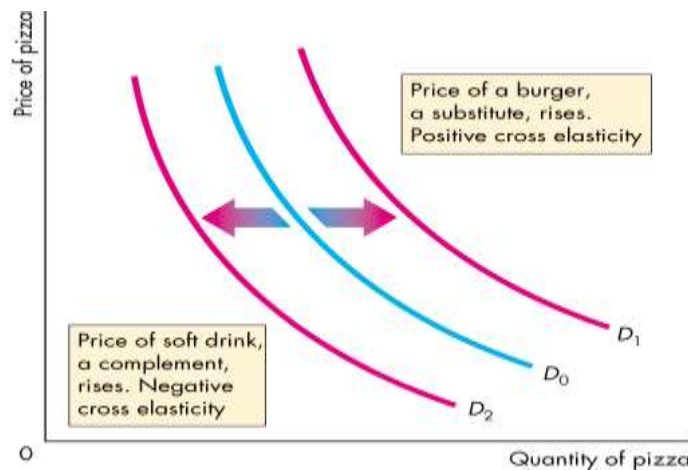
5. Compare between the cross elasticity of demand, and the income elasticity of demand.

- The cross elasticity of demand:

It is a measure of the responsiveness of demand for a good to a change in the price of a *substitute* or a *complement*, other things remaining the same.

$$E_c = \% \Delta \text{ in quantity demanded} / \% \Delta \text{ in price of substitute or complement}$$

a substitute good	a complement good
Price of a substitute good $\uparrow$ $E_c > 0$ (positive)	Price of a complement $\uparrow$ $E_c < 0$ (negative)



- Income Elasticity of Demand

the degree of responsiveness of a change in demand for a product due to the change in the income

$$E_y = \% \Delta \text{ in quantity demanded} / \% \Delta \text{ in Income}$$

a normal good	An inferior good
$E_y > 1 \rightarrow$ demand is <u>income elastic</u> and the good is a normal good. $0 < E_y < 1 \rightarrow$ demand is <u>income inelastic</u> and the good is a normal good. $+ E_y$	$E_y < 0$ (negative) $\rightarrow$ the good is an inferior good. $-E_y$

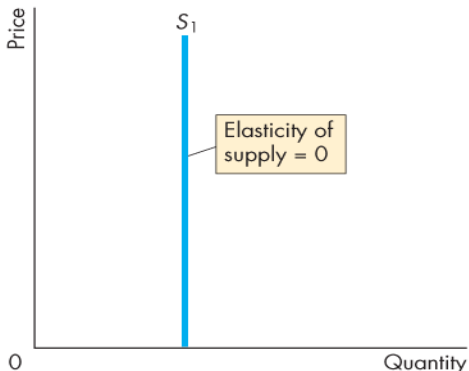
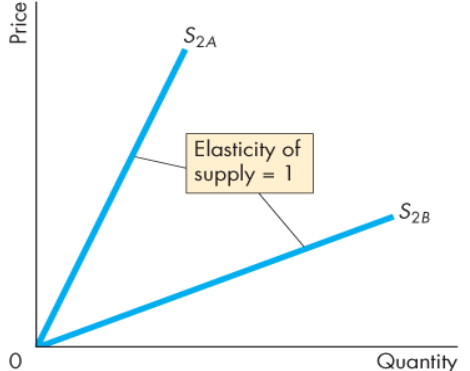
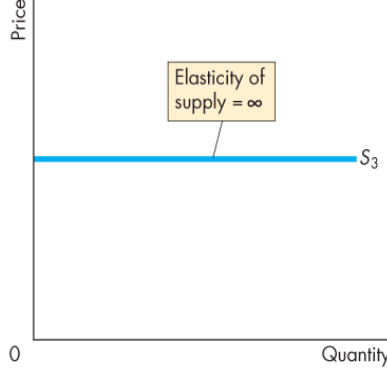
Elasticity of Supply

1. What is price elasticity of Supply?

The **elasticity of supply** measures the responsiveness of the quantity supplied to a change in the price of a good when all other influences on selling plans remain the same.

$$\text{Price elasticity of supply} = \% \Delta Q_s / \% \Delta P$$

2. What are types of price elasticity of supply? 3 Types

1) <i>perfectly inelastic</i>	2) <i>unit elastic</i>	3) <i>perfectly elastic</i>
If the price changes by 1%, quantity supplied will <u>not change</u>	If the price changes by 1%, quantity supplied will change <u>by 1%</u> $\% \Delta Q_s = \% \Delta P$	If the price changes by 1%, quantity supplied will change <u>infinitely large</u>
<u>Es = 0</u>	<u>Es = 1</u>	<u>Es = ∞</u>
the supply curve is vertical 	the supply curve is linear and passes through the origin 	the supply curve is horizontal 
(a) Perfectly inelastic supply	(b) Unit elastic supply	(c) Perfectly elastic supply

3. List Factors That Influence the Elasticity of Supply

1. Resource Substitution Possibilities (+ VE)

The easier it is to substitute among the resources used to produce a good or service, the greater is its elasticity of supply.

2. Time Frame for Supply Decision (+ VE)

The more time that passes after a price change, the greater is the elasticity of supply.

- **Momentary supply** is **perfectly inelastic**:
 - The quantity supplied immediately following a price change is constant.
- **Short-run supply** is **somewhat elastic**.
- **Long-run supply** is **the most elastic**