

Chapter 3: Demand in a Perfectly Competitive Market

Demand Curve for an Individual

Meet Isa 😊

- 2 **consumption options**:
 - soda and other goods
- **Satisfaction (in utils!)**
 - 1st soda can brings 2 utils,
 - 2nd soda can brings 4/3 utils,
 - 3rd soda can brings 1 util...
 - 1 unit of other goods brings 1 util (constant)
- Price: $P_{\text{can}} = \$2$ and $P_{\text{other-goods}} = \1 . Budget = $\$4$



? # of soda cans & other goods that max Isa's satisfaction?

Demand Curve for an Individual

Definitions:

Utility represents the satisfaction that an individual derives from consuming a given good or taking a certain action. It is measured in *utils per unit of time*.

Demand Curve for an Individual

Definitions:

Decreasing Marginal Utility captures the fact that the utility from consuming an **extra unit** of a given good **decreases** with the number of units that have been previously consumed.

Demand Curve for an Individual

| Soda | | | Other Goods | | |
|-------|---------------|------------------|-------------|---------------|------------------|
| Units | Total Utility | Marginal Utility | Units | Total Utility | Marginal Utility |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 2 | 2 | 1 | 1 | 1 |
| 2 | 10/3 | 4/3 | 2 | 2 | 1 |
| 3 | 13/3 | 1 | 3 | 3 | 1 |
| 4 | 77/15 | 4/5 | 4 | 4 | 1 |
| 5 | 174/30 | 4/6 | 5 | 5 | 1 |
| 6 | ... | ... | ... | ... | ... |

Table 3.1: Isa's satisfaction.

Marginal Benefit \geq Marginal Cost GO! Take the action

Marginal Benefit $<$ Marginal Cost Don't take the action

Demand Curve for an Individual

Cost-Benefit Principle:

The **Cost-Benefit Principle** states that an action should be taken if the marginal benefit is greater than the marginal cost.

Demand Curve for an Individual

| Soda | | | Other Goods | | |
|-------|---------------|------------------|-------------|---------------|------------------|
| Units | Total Utility | Marginal Utility | Units | Total Utility | Marginal Utility |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 2 | 2 | 1 | 1 | 1 |
| 2 | 10/3 | 4/3 | 2 | 2 | 1 |
| 3 | 13/3 | 1 | 3 | 3 | 1 |
| 4 | 77/15 | 4/5 | 4 | 4 | 1 |
| 5 | 174/30 | 4/6 | 5 | 5 | 1 |
| 6 | ... | ... | ... | ... | ... |

Table 3.1: Isa's satisfaction.

Quantities Demanded when budget is \$4:

- 1 can of soda (**total expenditure = $1 \times \$2 = \2**) and
- 2 units of other goods (**total expenditure = $2 \times \$1 = \2**)

Demand Curve for an Individual

Definition:

The **Quantity Demanded** by a consumer represents the quantity of a given good or service that maximizes the utility experienced by the individual consuming it.

Demand Curve for an Individual

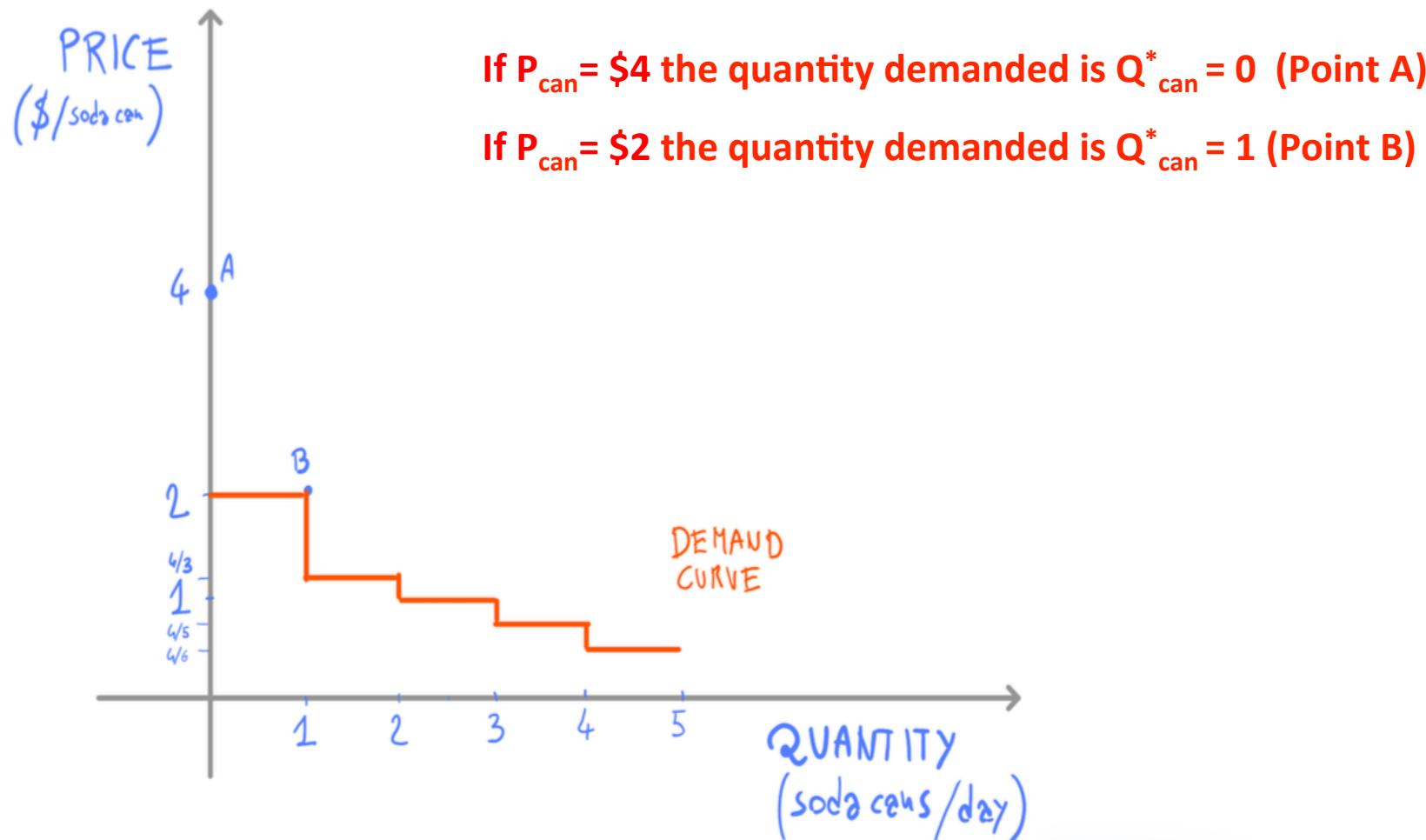
Definition:

The **Demand Curve** represents the relationship between the price of a good or service and the quantity demanded of that good or service.



Vary the price of soda cans to see how
the demand of soda cans would change with it (?)

Demand Curve for an Individual



Demand Curve for an Individual

Law of Demand:

The tendency for a consumer to **demand more** of a certain good or service **when the price of that good or service decreases.**

Demand Curve for an Individual

Why did the demand for soda ↓ when price ↑?

- other goods became cheaper (relative to the price of soda) than before and so Isa decided to consume more of them → **substitution effect**
- an increase in the price soda makes Isa poorer in terms of her purchasing power → **income effect**

Demand Curve for an Individual

Definition:

The **Substitution Effect** captures the change in the quantity demanded of a given good following a change in its relative price.

- ↓ price → Substitution Effect ↑ quantity consumed.
- ↑ price → Substitution Effect ↓ quantity consumed.

Demand Curve for an Individual

Definition:

The **Income Effect** captures the changes in the quantity demanded of a given good following the reduction in the consumer's purchasing power.

↓ price → Income Effect ? quantity consumed.

↑ price → Income Effect ? quantity consumed.

Demand Curve for an Individual

Income Effect:

For a **normal good**,

↓ in income → ↓ quantity consumed.

↑ in income → ↑ quantity consumed.

For an **inferior good**,

↓ in income → ↑ quantity consumed.

↑ in income → ↓ quantity consumed.

Demand Curve for an Individual

Substitution Effect + Income Effect:

Usually the Substitution Effect dominates so

↑ price → ↓ overall quantity consumed.

↓ price → ↑ overall quantity consumed.

For a **Giffen good** (very rare),

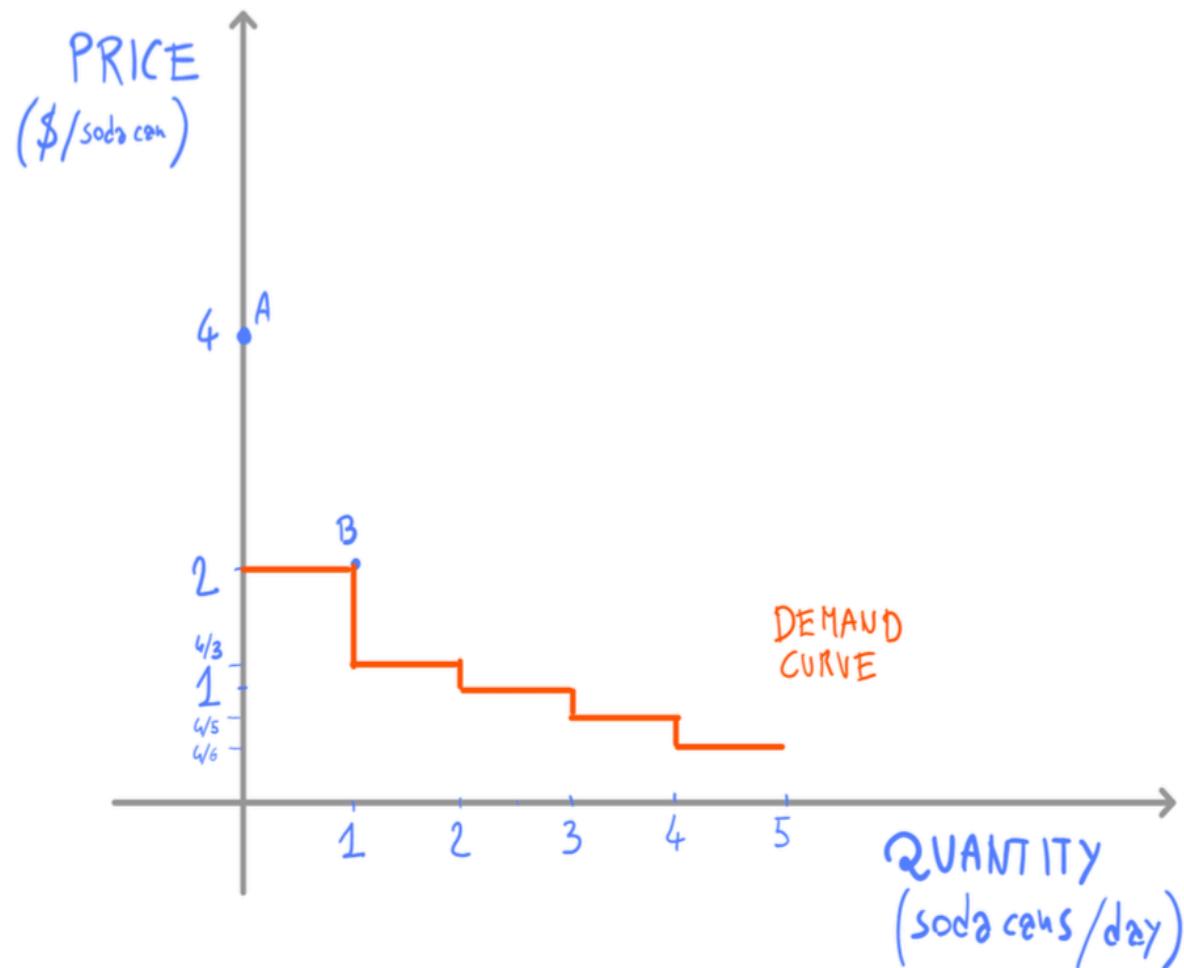
↑ in price → ↑ overall quantity consumed!!

Demand Curve for an Individual

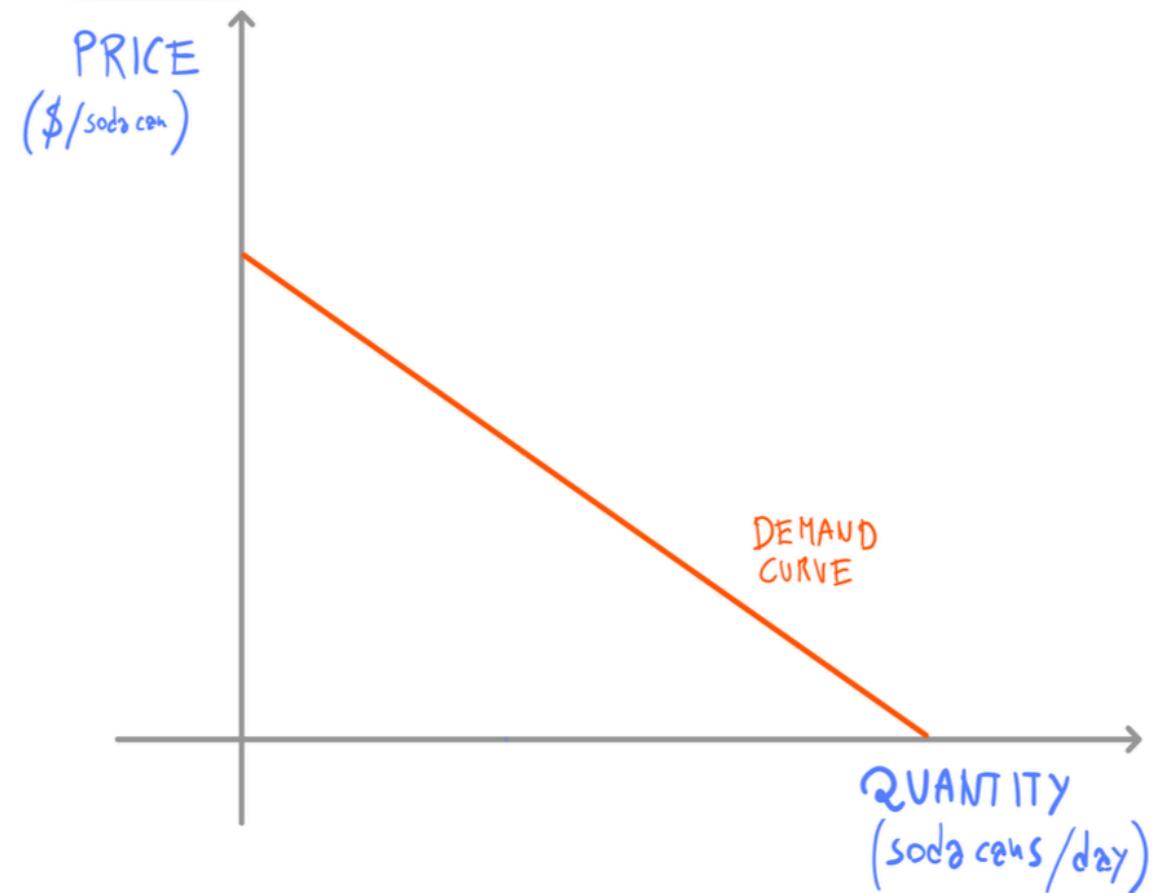
Demand curve can be interpreted

- **Horizontally**: Start from a certain Price and then use the demand curve to derive the Quantity of goods that the consumer is willing to buy at that price .
- **Vertically**: Start from a given Quantity, find the associated Price on the demand curve → the maximum amount of money the consumer is willing to pay for the *marginal unit* of the good, also called ***Consumer Reservation Price (or Willingness to Pay)***

From a **Discrete** to a Continuous Model



From a Discrete to a **Continuous** Model



From a Discrete to a Continuous Model

Demand Curve = MB curve (for consumer)

$\Delta P \rightarrow ?? \Delta Q \rightarrow$ move *along* the demand curve

Δ preferences (mkting, price of other goods) \rightarrow *shift* of the demand curve

From a Discrete to a Continuous Model

Definition:

Two goods are **Substitutes** when an \uparrow in the price of one causes an \uparrow in the quantity demanded of the other.

Two goods are **Complements** when a \downarrow in the price of one causes an \uparrow in the quantity demanded of the other.

From a Discrete to a Continuous Model

What **shifts the demand curve to the right:**

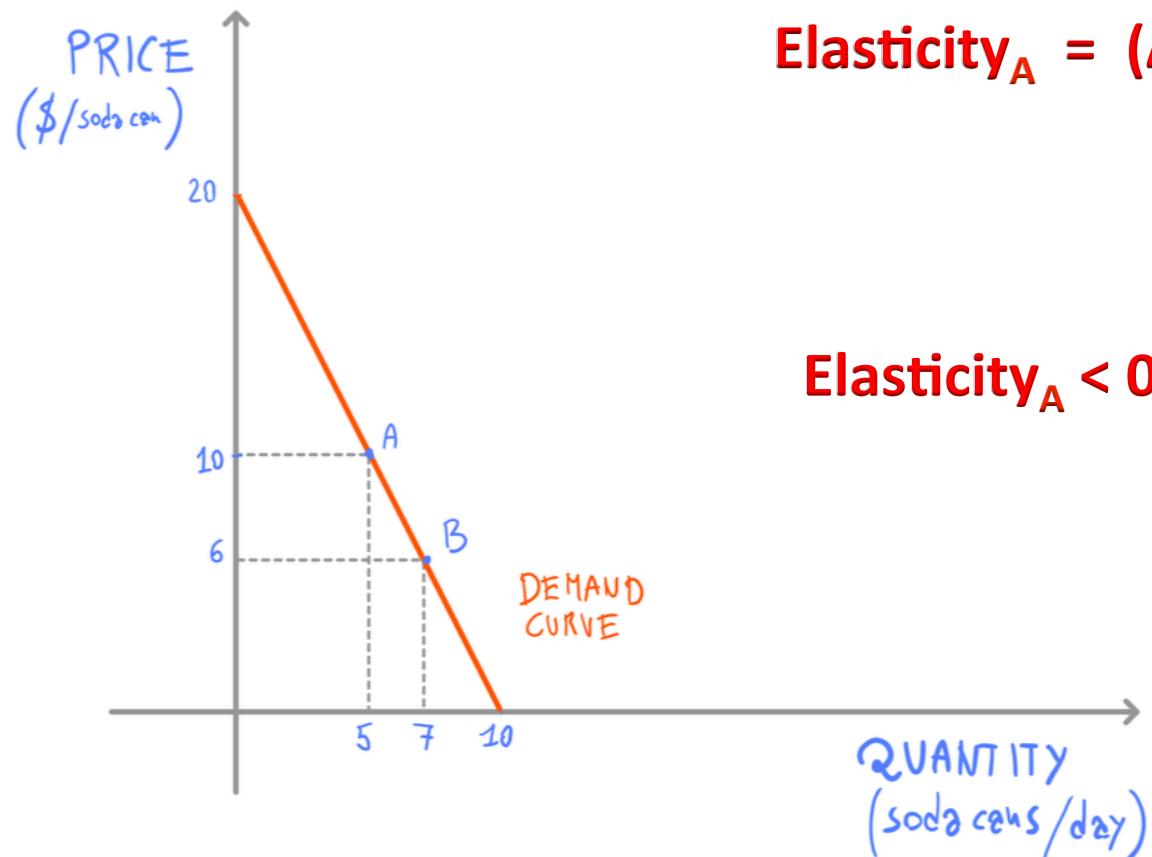
- Successful **marketing** campaign
- Decrease in the **price of complements**
- An increase in the **price of substitutes**
- An increase in **income** for a normal good
- A decrease in **income** for an inferior good
- A positive shift in **consumers' preferences** for a good
- **Expectations** (about ↑in future prices that push the buyers to try to purchase the goods early)
- **Population growth**

Price Elasticity of Demand

Definition:

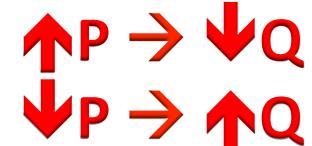
The **Price Elasticity of Demand** represents the *percentage change in the quantity demanded resulting from a very small percentage change in price*. It also measures the **responsiveness of the demand to changes in price**.

Price Elasticity of Demand



$$\text{Elasticity}_A = (1/\text{slope}) \times (P_A/Q_A)$$
$$\text{Elasticity}_A = (\Delta Q/Q_A) / (\Delta P/P_A)$$

Elasticity_A < 0 ... Why?



(Convention:
When we report the elasticity we
always use its absolute value)

Price Elasticity of Demand

Law of Demand:

Demand curves have the tendency of being **downward sloping**.

Price Elasticity of Demand

Definition:

Elastic Demand: Demand is elastic when the price elasticity of demand is **greater than 1**.

Unit Elastic Demand: Demand is unit elastic when the price elasticity of demand is **equal to 1**.

Inelastic Demand: Demand is inelastic when the price elasticity of demand is **less than 1**.

Price Elasticity of Demand

What **changes the elasticity of demand**:

- Availability of substitutes
- Definition of goods
- Income share
- Time horizon