

Price-Demand-Income Elasticity

Measuring Responsiveness:

Elasticity :

Price

Demand

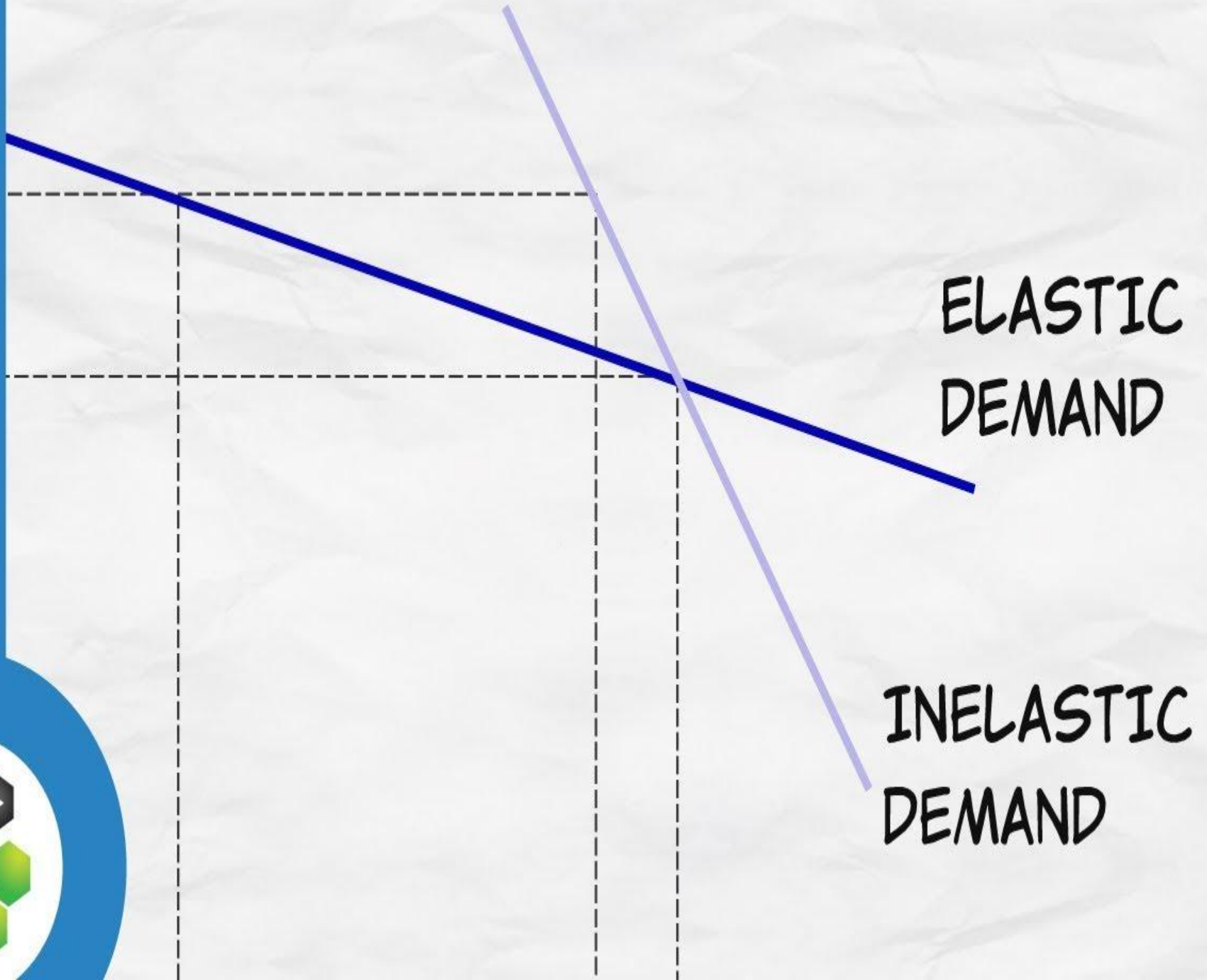
Income

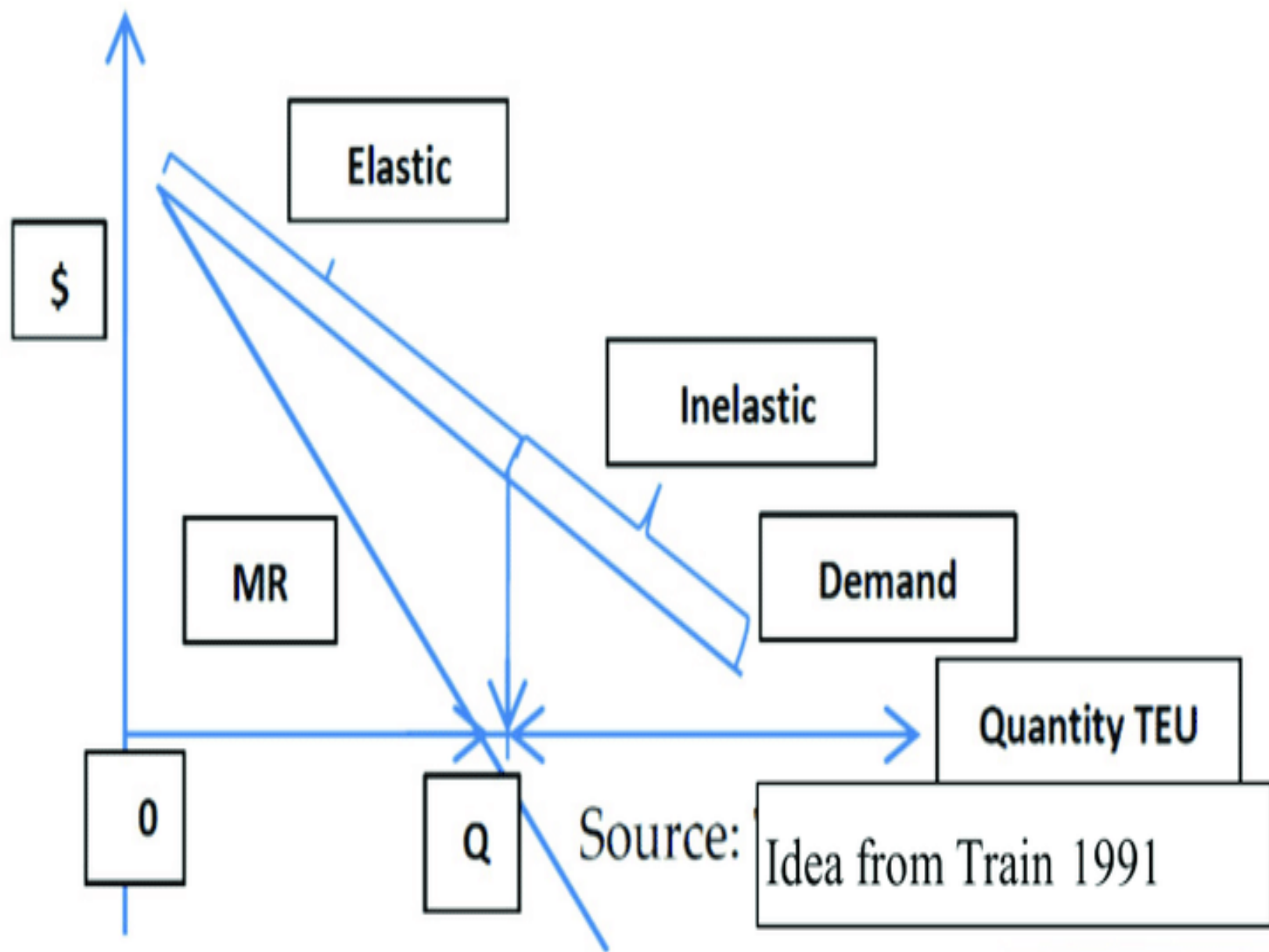
Price Elasticity of Demand

Definition: the effect of change in price on the quantity of demand.

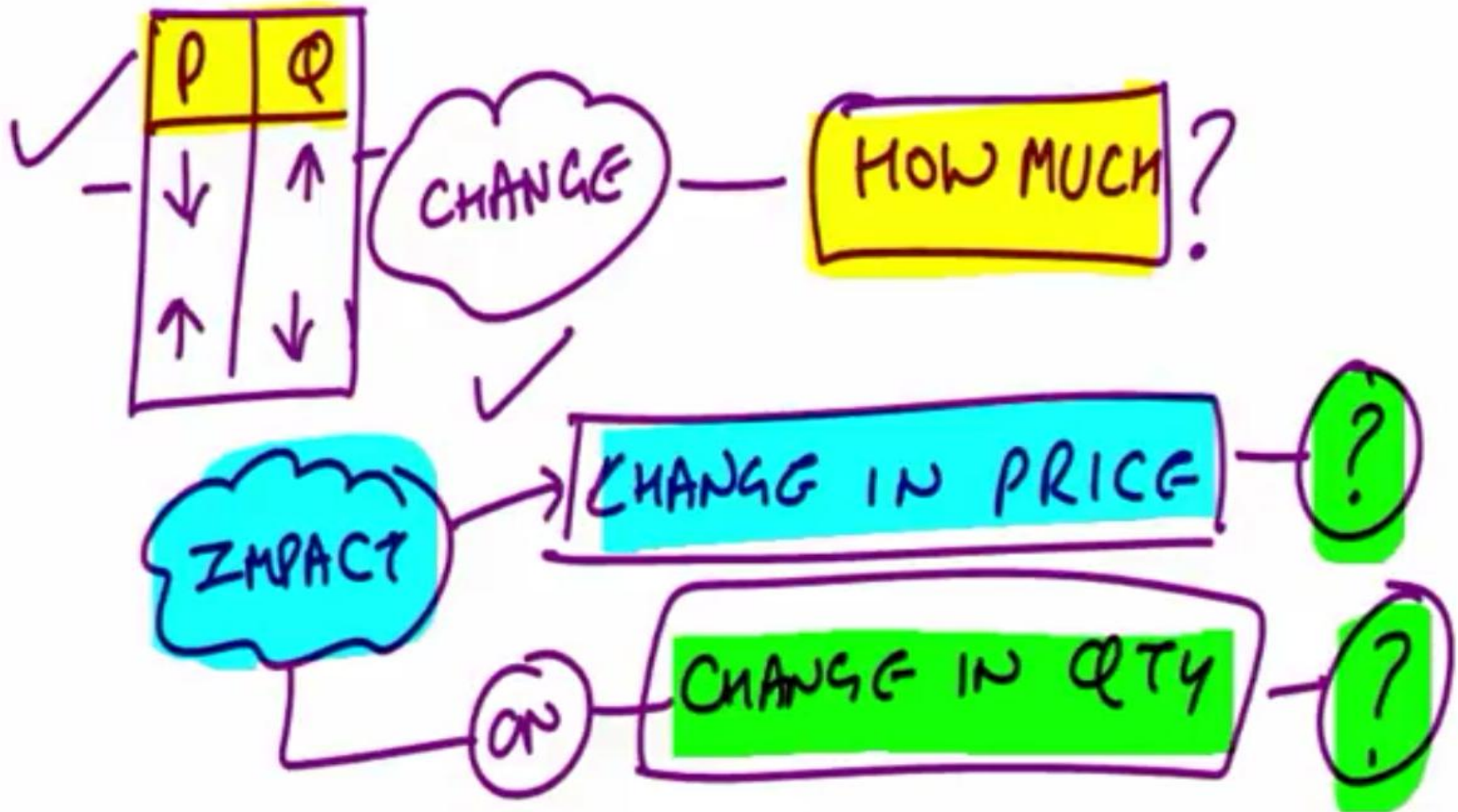
$$\text{PED} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$







Price-Quantity Elasticity



Price-Quantity Elasticity

	Δ PRICE	Δ QTY
1		✓
2		✓
3		✓
4		✓

ΔP — ΔQ

How **MUCH**
DOES THIS
QTY
RESPOND?

Price-Quantity Elasticity

(1)

P	Q
10	100
15	50

- $\Delta P = 5$
- $\Delta Q = 50$

- $P = 10$
- $Q = 100$

(2)

P	Q
10	100
15	20

- $\Delta P = 5$
- $\Delta Q = 80$

- $P = 10$
- $Q = 100$

(3)

P	Q
10	100
15	80

- $\Delta P = 5$
- $\Delta Q = 20$

- $P = 10$
- $Q = 100$

Price-Quantity Elasticity

(1)

P	Q
10	100
15	50

- $\Delta P = 5$
- $\Delta Q = 50$
- $P = 10$
- $Q = 100$

% Δ IN PRICE	% Δ IN QTY
---------------------	-------------------

(2)

P	Q
10	100
15	20

- $\Delta P = 5$
- $\Delta Q = 80$
- $P = 10$
- $Q = 100$

% Δ IN PRICE	% Δ IN QTY
---------------------	-------------------

(3)

P	Q
10	100
15	80

- $\Delta P = 5$
- $\Delta Q = 20$
- $P = 10$
- $Q = 100$

% Δ IN PRICE	% Δ IN QTY
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Price-Quantity Elasticity

(1) <table> <tr> <th>P</th> <th>Q</th> </tr> <tr> <td>10</td> <td>100</td> </tr> <tr> <td>15</td> <td>50</td> </tr> </table>	P	Q	10	100	15	50	$\Delta P = 5$ $\Delta Q = 50$ $P = 10$ $Q = 100$	% Δ IN PRICE $= \frac{\Delta P}{P} \times 100$ $= \frac{5}{10} \times 100 = 50\%$	% Δ IN QTY $= \frac{\Delta Q}{Q} \times 100$ $= \frac{50}{100} \times 100 = 50\%$	$\frac{\% \Delta P}{\% \Delta Q} = 1$ $50\% = 50\%$ $e = 1$
P	Q									
10	100									
15	50									
(2) <table> <tr> <th>P</th> <th>Q</th> </tr> <tr> <td>10</td> <td>100</td> </tr> <tr> <td>15</td> <td>20</td> </tr> </table>	P	Q	10	100	15	20	$\Delta P = 5$ $\Delta Q = 80$ $P = 10$ $Q = 100$	% Δ IN PRICE $= \frac{\Delta P}{P} \times 100$ $= 50\%$	% Δ IN QTY $= \frac{\Delta Q}{Q} \times 100$ $= \frac{80}{100} \times 100 = 80\%$	$\frac{\% \Delta P}{\% \Delta Q} < 1$ $50\% < 80\%$ $e > 1$
P	Q									
10	100									
15	20									
(3) <table> <tr> <th>P</th> <th>Q</th> </tr> <tr> <td>10</td> <td>100</td> </tr> <tr> <td>15</td> <td>80</td> </tr> </table>	P	Q	10	100	15	80	$\Delta P = 5$ $\Delta Q = 20$ $P = 10$ $Q = 100$	% Δ IN PRICE $= \frac{\Delta P}{P} \times 100$ $= 50\%$	% Δ IN QTY $= \frac{\Delta Q}{Q} \times 100$ $= \frac{20}{100} \times 100 = 20\%$	$\frac{\% \Delta P}{\% \Delta Q} > 1$ $50\% > 20\%$ $e < 1$
P	Q									
10	100									
15	80									

Price-Quantity Elasticity

ELASTICITY
OF
DEMAND =

- ELASTICITY OF DD IS MEASUREMENT TOOL OF
- RESPONSIVENESS OF QTY DEMANDED
- TO CHANGE IN ITS PRICE.

$$e = \frac{\% \text{ CHANGE IN QUANTITY DD}}{\% \text{ CHANGE IN PRICE}}$$

Price-Quantity Elasticity

	Δ PRICE	Δ QTY
1		✓
2		✓
3		✓
4		✓

ΔP — ΔQ

How **MUCH**
DOES THIS
QTY
RESPOND?

$$\left(\begin{array}{l} \Delta P = \Delta Q \\ \Delta P < \Delta Q \\ \Delta P > \Delta Q \end{array} \right)$$

Price-Quantity Elasticity

$\% \Delta P = \% \Delta Q$	$e_d = 1$	UNIT ELASTIC DEMAND
$\% \Delta P < \% \Delta Q$	$e_d > 1$	MORE THAN UNIT ELASTIC DEMAND ELASTIC DD
$\% \Delta P > \% \Delta Q$	$e_d < 1$	LESS THAN UNIT ELASTIC DEMAND INELASTIC DD
$\% \Delta P \rightarrow$ DOES NOT AFFECT $\% \Delta Q$	$e_d = 0$	<u>PERFECTLY INELASTIC</u>
(VERY SLIGHT CHANGE IN PRICE) — DEMAND	$e_d = \infty$	PERFECTLY ELASTIC DEMAND

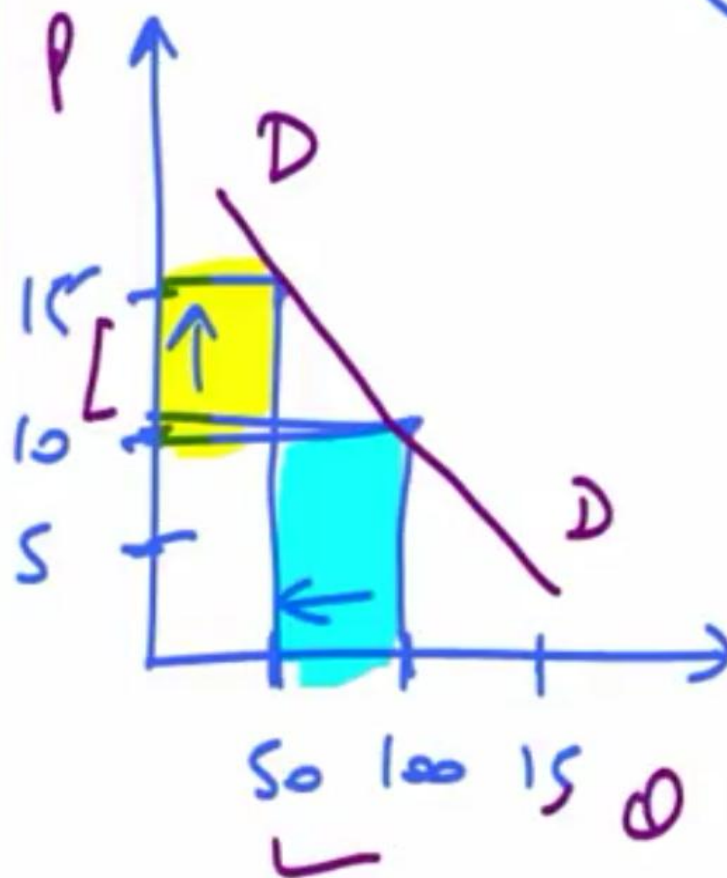
Unit Elastic Demand

3

P	Q
10	100
15	50

UNIT
ELASTIC
DD

$$ed = 1$$



Elastic Demand

④

P	Q
10	100
15	20

MORE THAN
UNIT ELASTIC
DEMAND

ELASTIC
DD

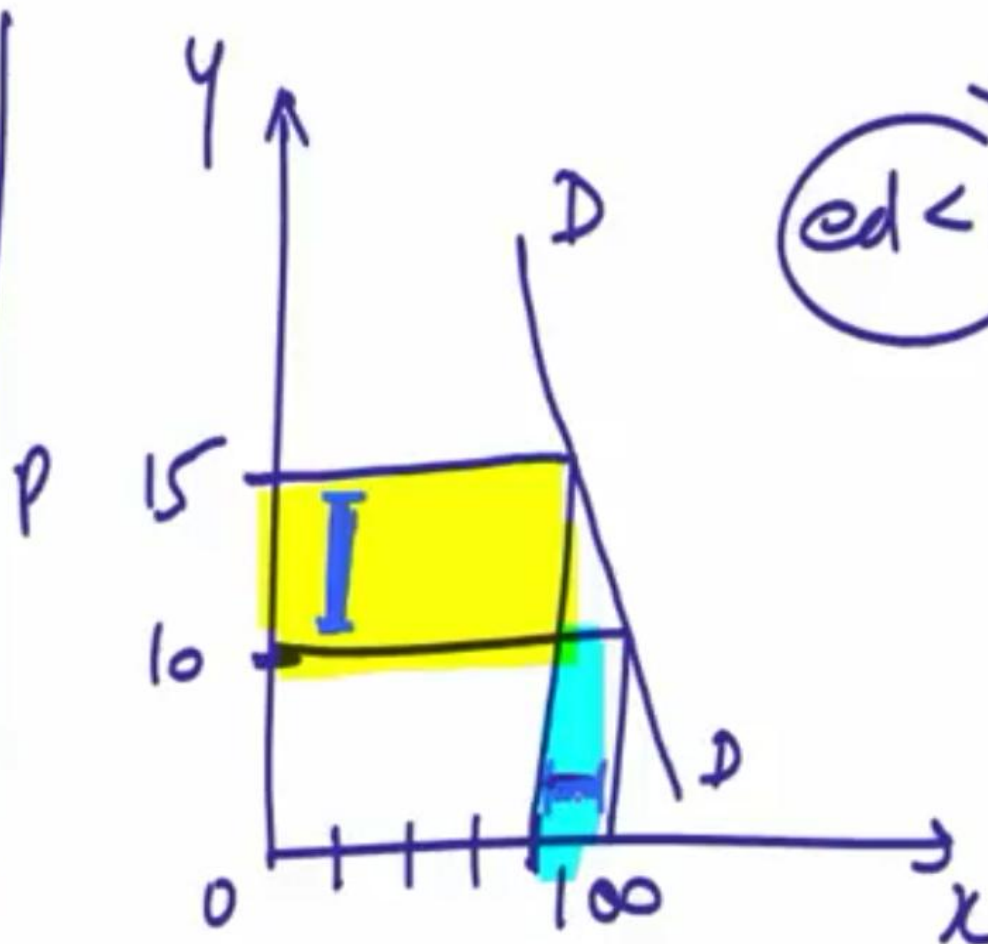


Inelastic Demand

②

P	Q
10	100
15	80

INELASTIC
DD
LESS THAN
UNIT ELASTIC
DD



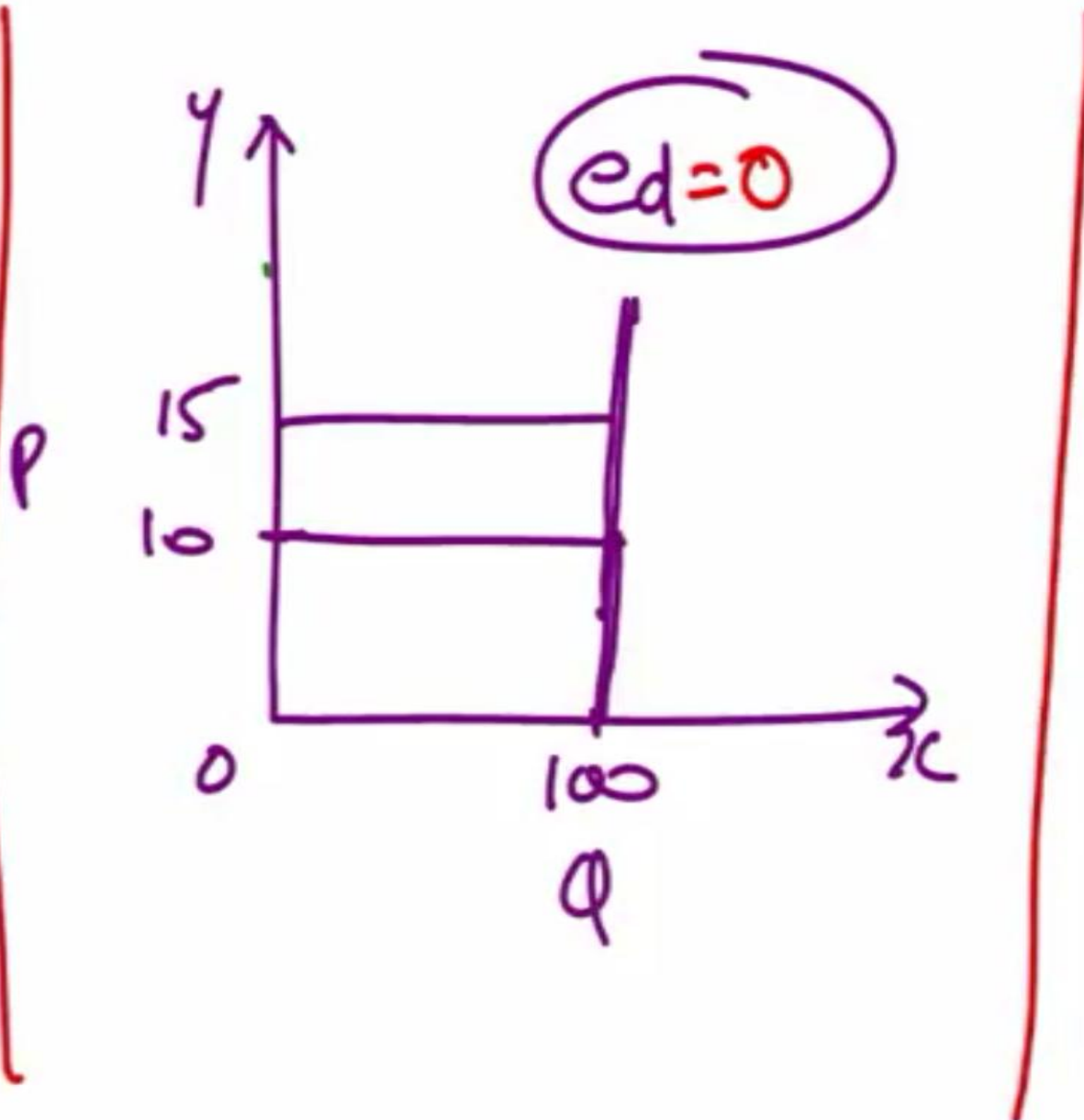
$$ed < 1$$

$$\frac{100}{100}$$

Perfectly Inelastic Demand

P	Q
10	100
15	100

PERFECTLY
INELASTIC DD



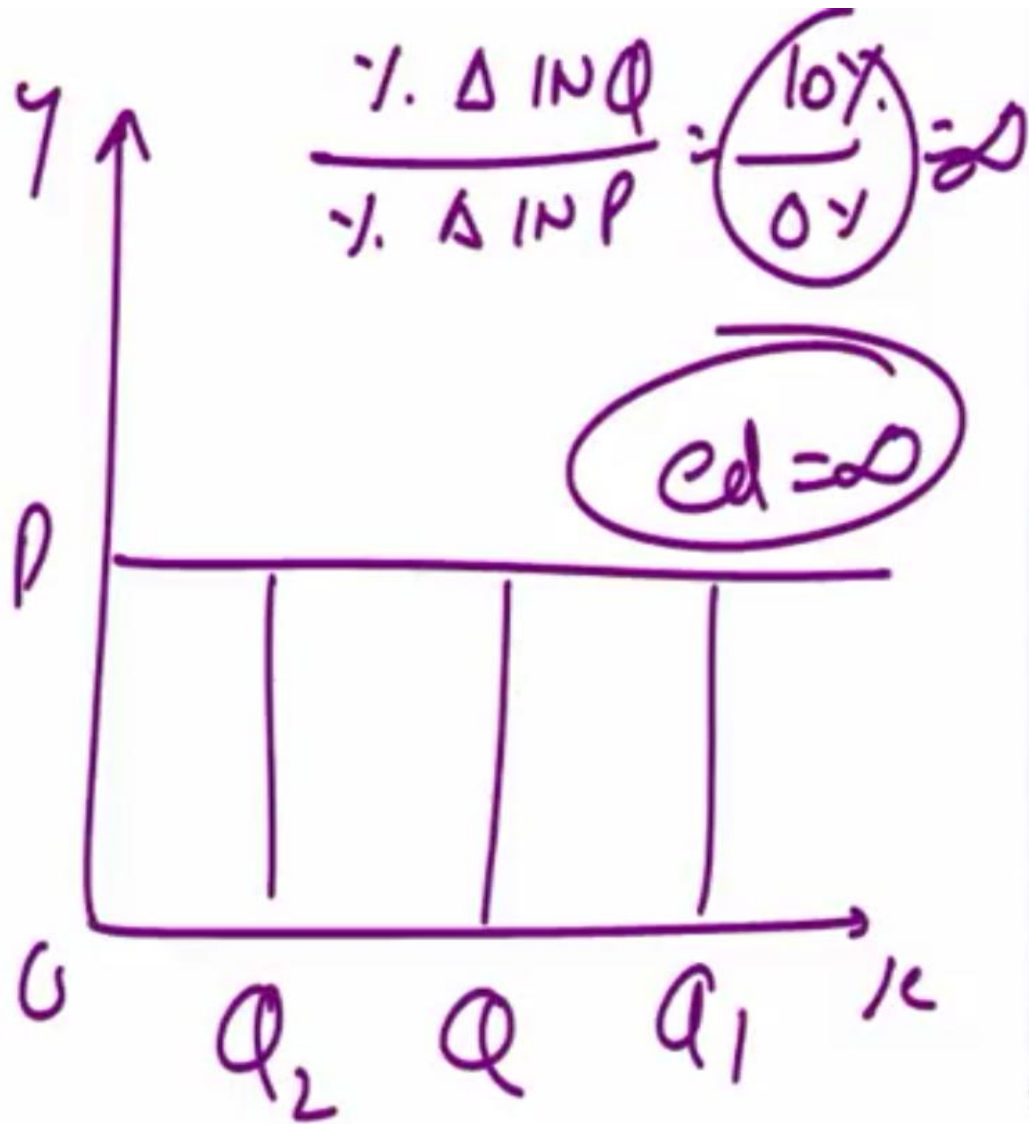
Perfectly Elastic Demand

5

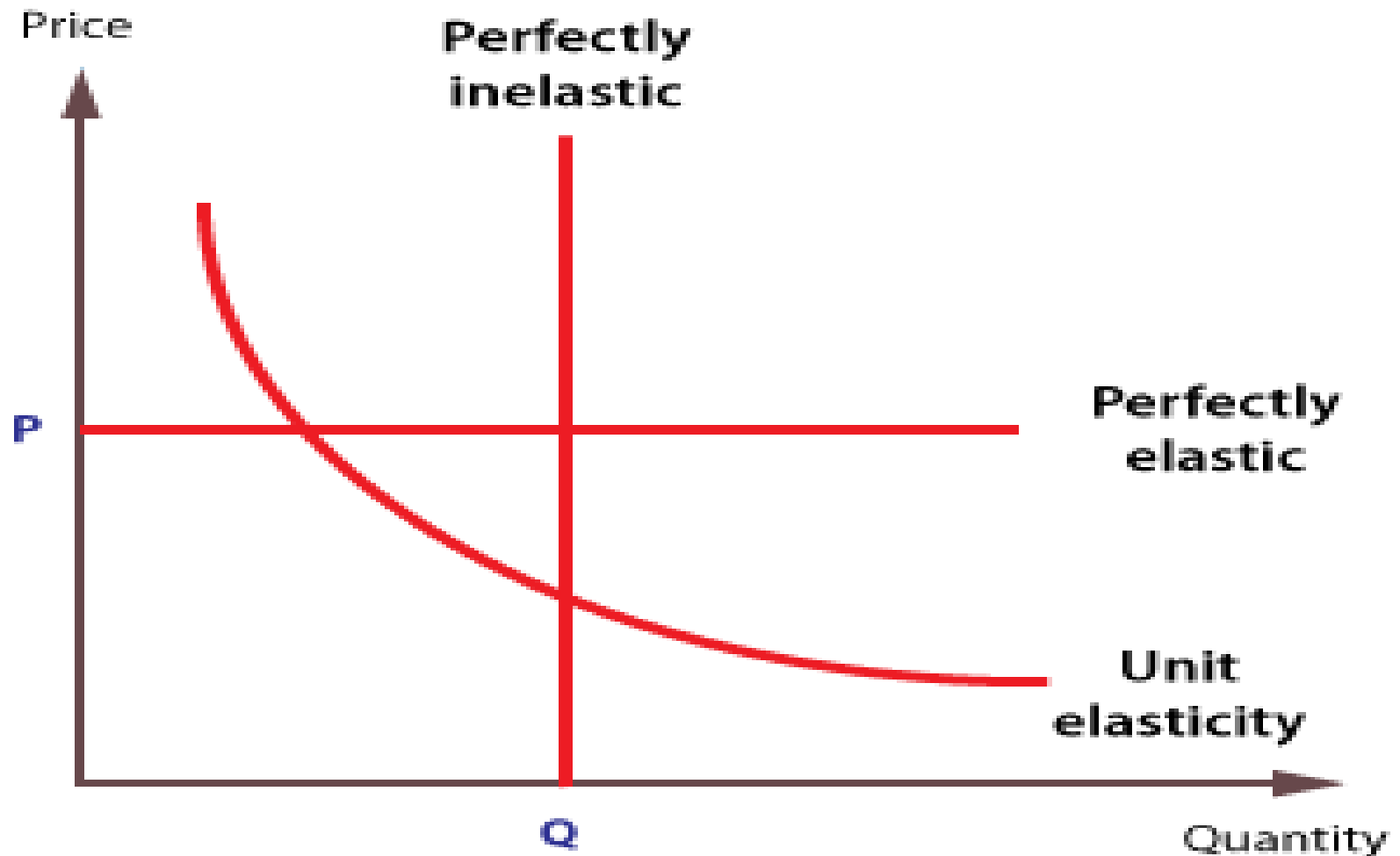
P	Q
10	100
10	200

ZERO
CHANGE

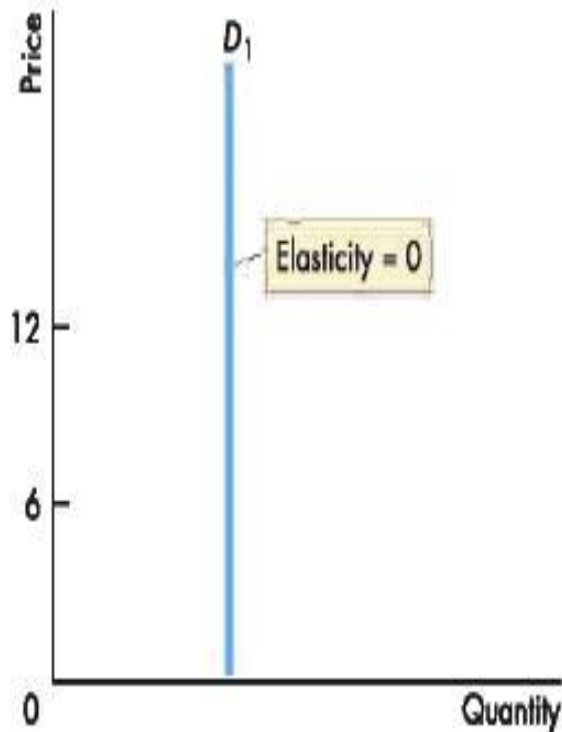
PERFECTLY
ELASTIC
DD



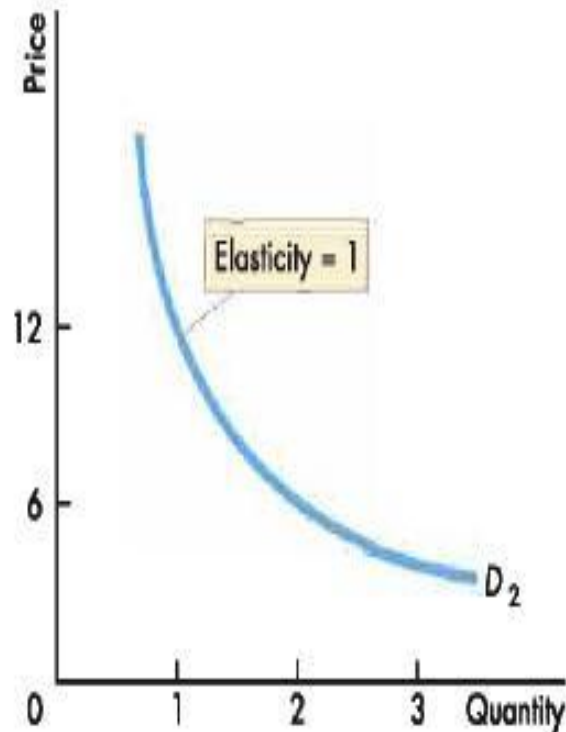
Elasticity of Demand



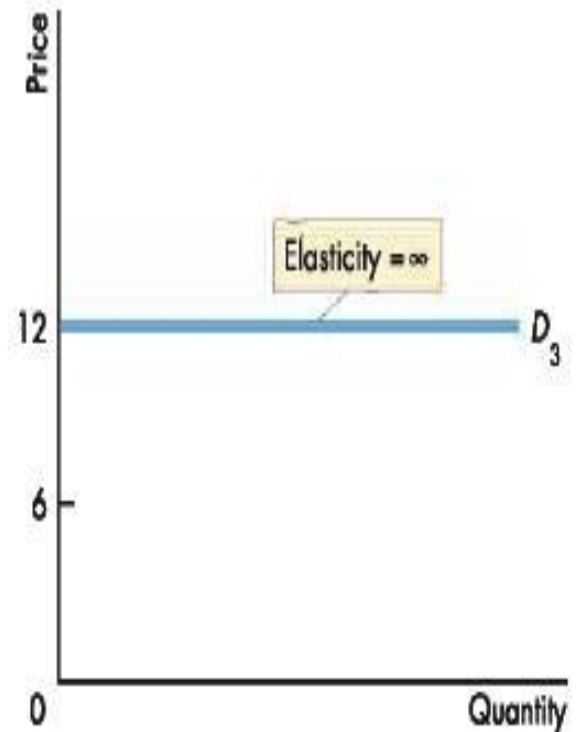
Elasticity of Demand



(a) Perfectly inelastic demand



(b) Unit elastic demand



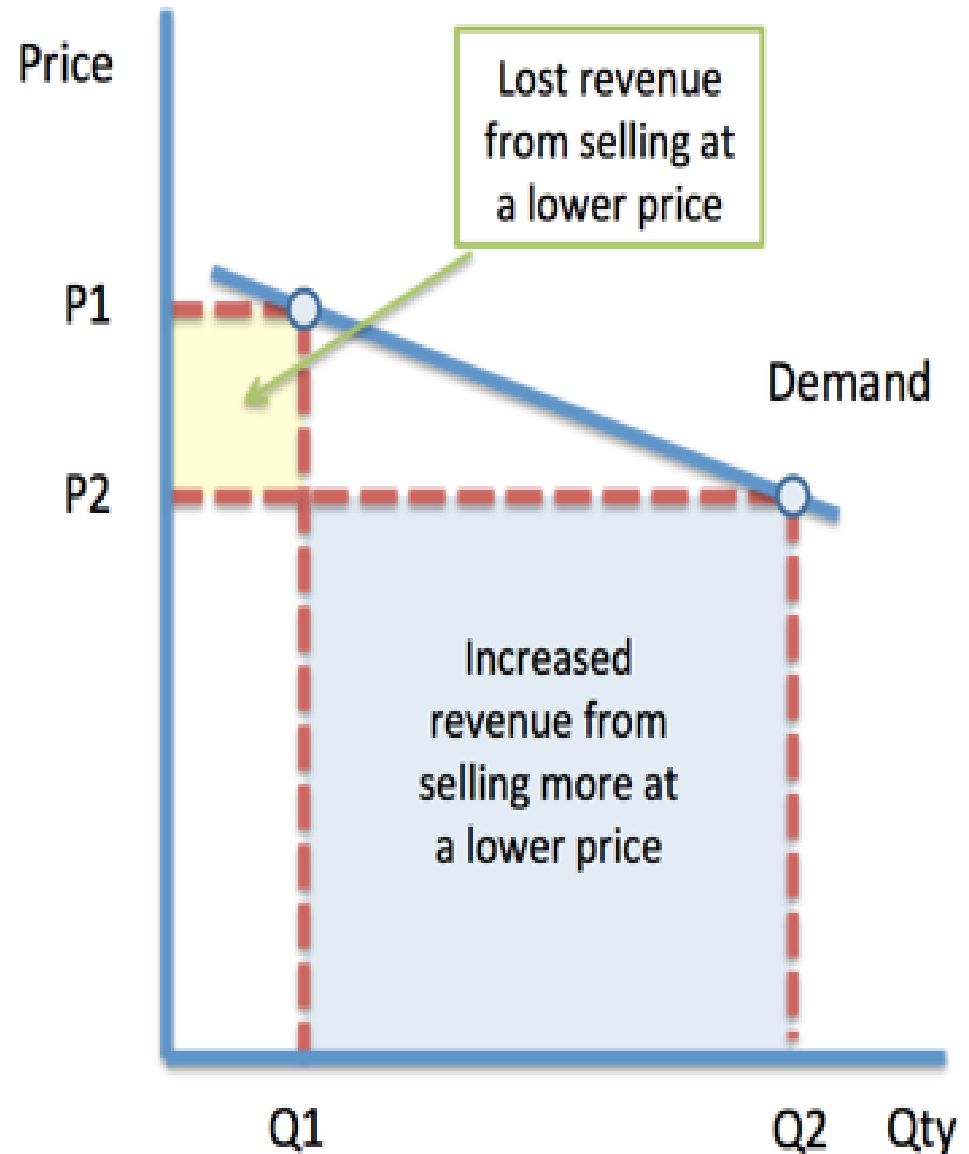
(c) Perfectly elastic demand

Each demand illustrated here has a constant elasticity. The demand curve in part (a) illustrates the demand for a good that has a zero elasticity of demand. The demand curve in part (b)

illustrates the demand for a good with a unit elasticity of demand. And the demand curve in part (c) illustrates the demand for a good with an infinite elasticity of demand.

Income Elasticity of Demand

- If demand for a product is price elastic, a supplier stands to gain extra revenue if they reduce their prices.
- The change in quantity demanded will be proportionately higher than the reduction in price. This is shown in the diagram opposite.



Income Elasticity of Demand

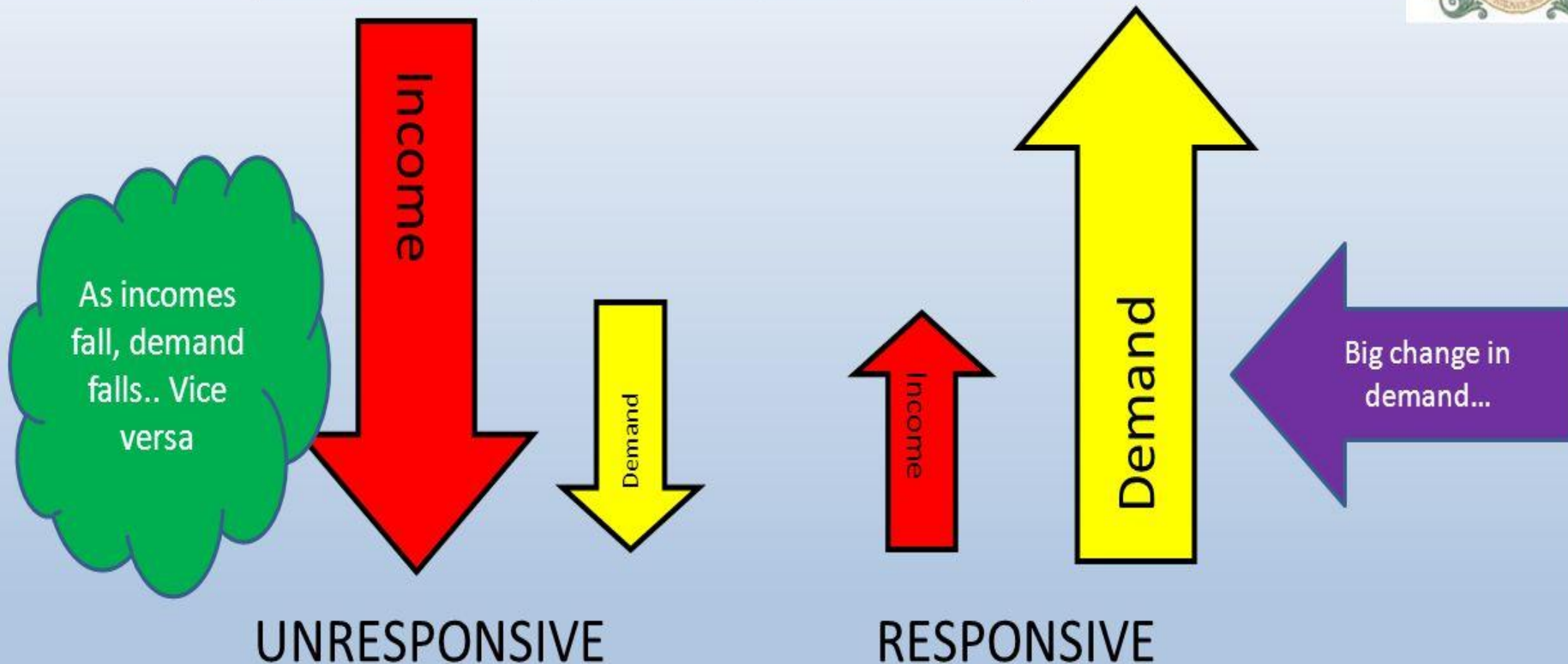
Economics Section: Income elasticity

Further Reading c.9

Keywords – Income elastic, income inelastic, normal good, inferior good, discretionary.



YED is mostly positively correlated.



Price and Income Elasticity of Demand

Elasticity measures the responsiveness of a variable to a change in another variable.

Price Elasticity of Demand (PED)

The responsiveness of the quantity demanded of a good or service to a change in the price.

$$PED = \frac{\Delta\% \text{ in Quantity Demanded}}{\Delta\% \text{ in Price}}$$

$$0 \geq PED > -1$$

Inelastic Demand

Percentage change in demand is less than percentage change in price.

$$-1 > PED \geq -\infty$$

Elastic Demand

Percentage change in demand is more than percentage change in price.

Product
Differentiation

Availability of
Substitutes

Customer
Loyalty

Income Elasticity of Demand (YED)

The responsiveness of the quantity demanded of a good or service to a change in income.

$$YED = \frac{\Delta\% \text{ in Quantity Demanded}}{\Delta\% \text{ in Income}}$$

Inferior Good

$$YED < 0$$

Income
Demand



Normal Good

$$0 < YED$$

Income
Demand



Luxury Good

$$YED > 1$$

Income
Demand



Why is it so important to know the Income Elasticity of Demand (YED) from a firm's perspective?