Elasticity

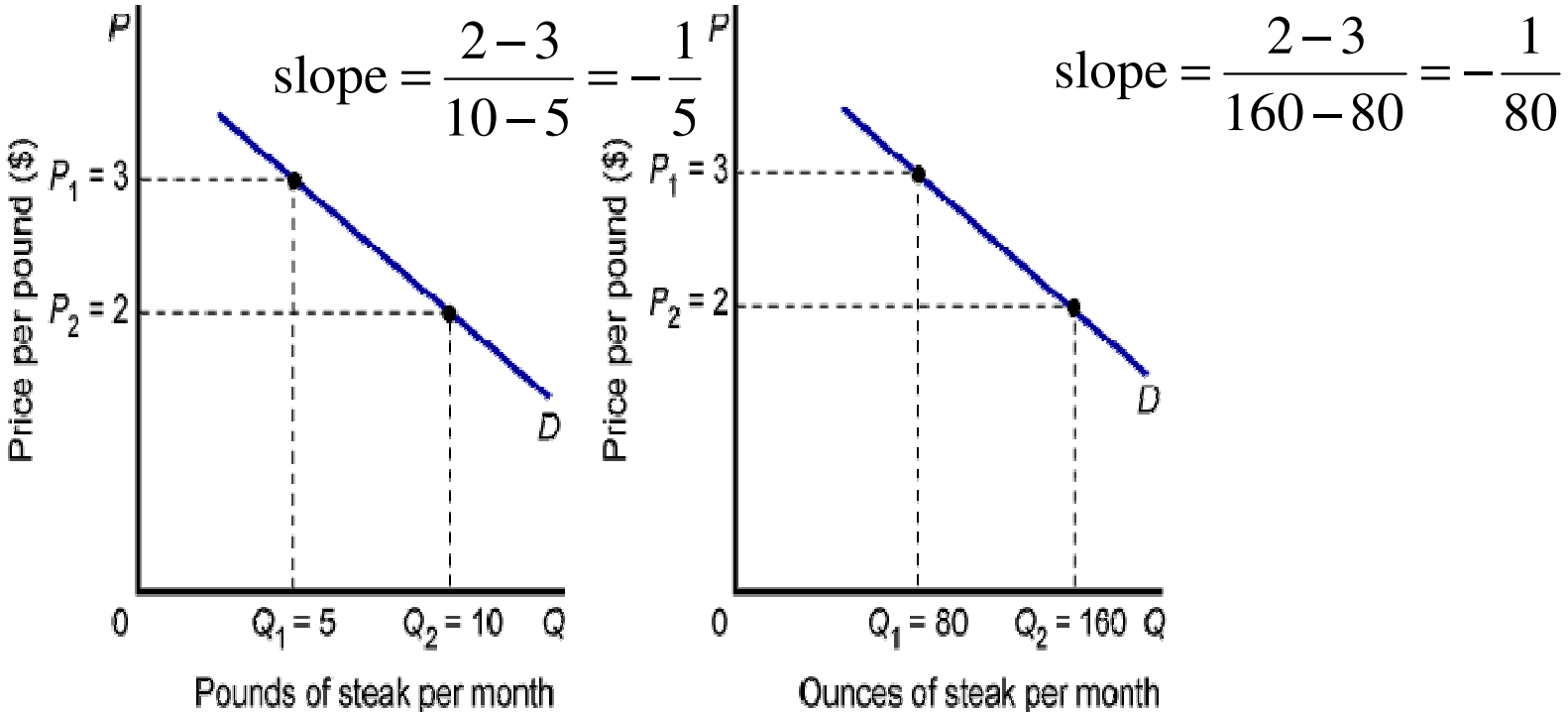
In general terms is concerned with responsiveness or sensitivity of one variable to the change in another

It can be defended as a ratio of the percentage change in dependent variable to the percentage change in the independent variable

The weakness of the slope as a measure of the responsiveness

1. The value of the slope is dependent on the units of measurement

1. The value of slope dependent on the unit of measurement



- **Changing the units of measure yields a very different value of the slope, yet the behavior of buyers in both diagrams is identical.**

2. The value of the slope of the demand curve and the value of elasticity are not the same.

- Ex. slope of a linear demand curve is invariant or fixed with respect to the price .

1. Price Elasticity of demand (own or elasticity of demand)

- e_p, η, ε are common symbols used to represent price elasticity
- Definition . it is the percentage change in a quantity demand in response to a 1 percentage change in price

$$e_p \equiv \frac{\%\ \text{change in quantity demanded}}{\%\ \text{change in price}}$$

or, $e_p \equiv \dfrac{\%\ \Delta Q}{\%\ \Delta P}$

At a point on a demand function this can be calculated by:

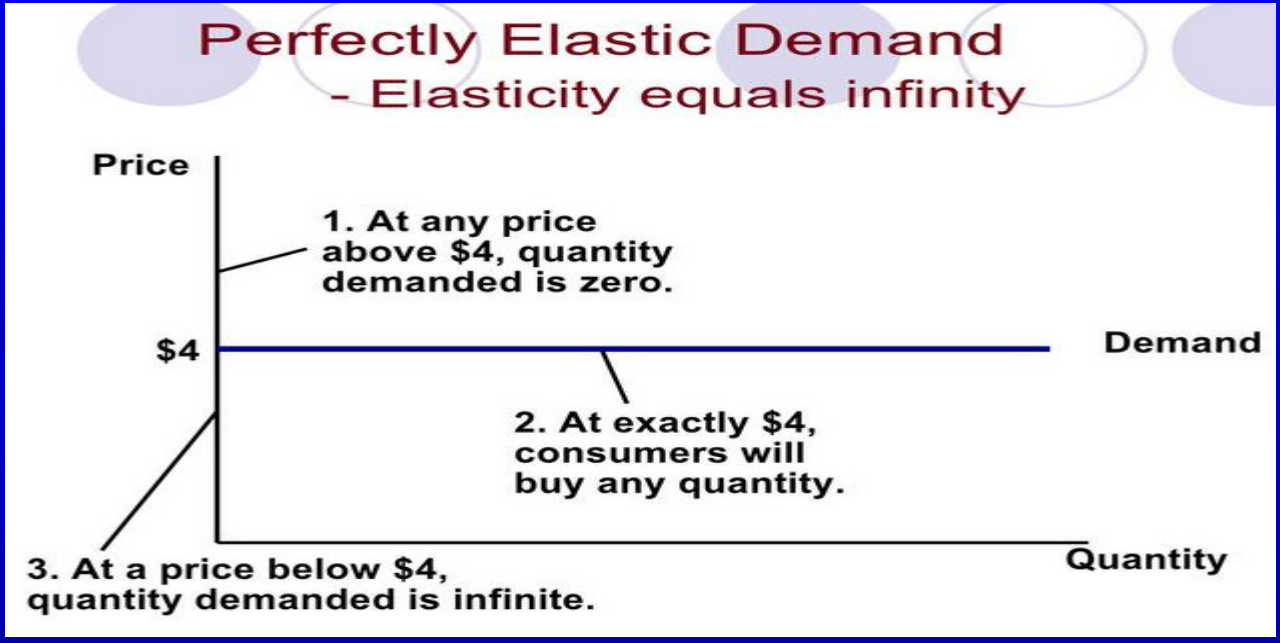
$$e_p = \frac{\dfrac{Q_2 - Q_1 = \Delta Q}{Q_1}}{\dfrac{P_2 - P_1 = \Delta P}{P_1}} = \frac{\dfrac{\Delta Q}{Q_1}}{\dfrac{\Delta P}{P_1}}$$

Kinds of price Elasticity of Demand

1. Perfectly elastic Demand
2. Relativily elastic demand
3. Unitary Elastic demand
4. Relativily inelastic demand
5. Perfectly inelastic Demand

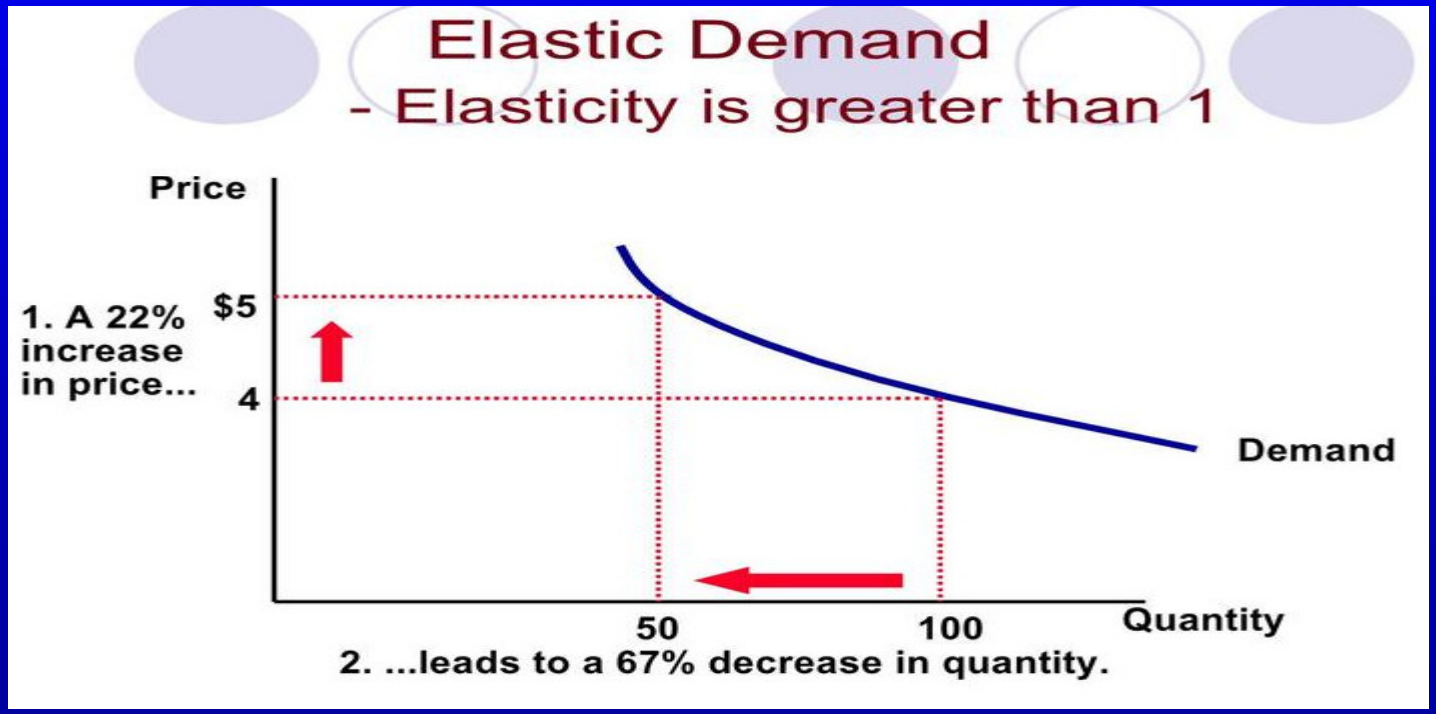
1.Perfectly elastic Demand

Perfectly Elastic Demand: Demand for a commodity is said to be perfectly elastic, when a small change in its price results in an infinite change in its quantity demanded



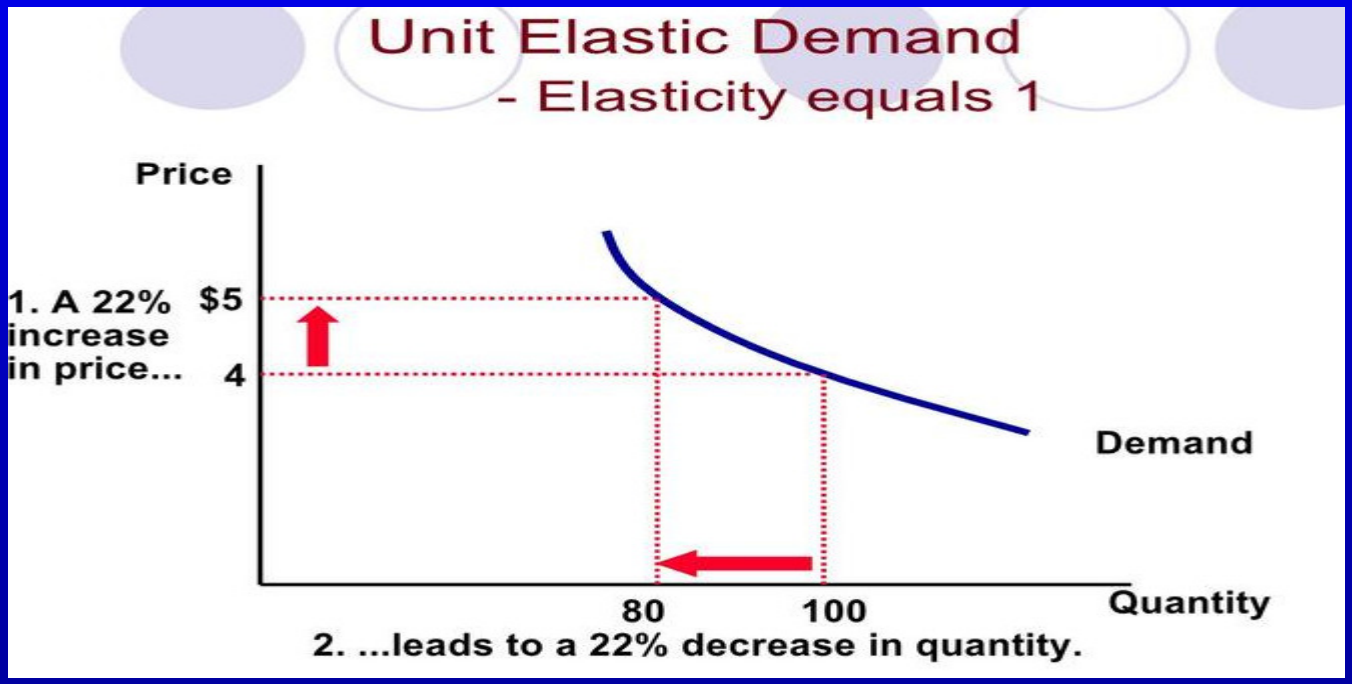
2.Relativily elastic Demand

More than Unit Elastic: Demand for a commodity will be said to be more than unit elastic if a change in price results in a significant change in demand for this commodity. If 22 percent change in price results in 67 percent change in demand, it is elastic demand



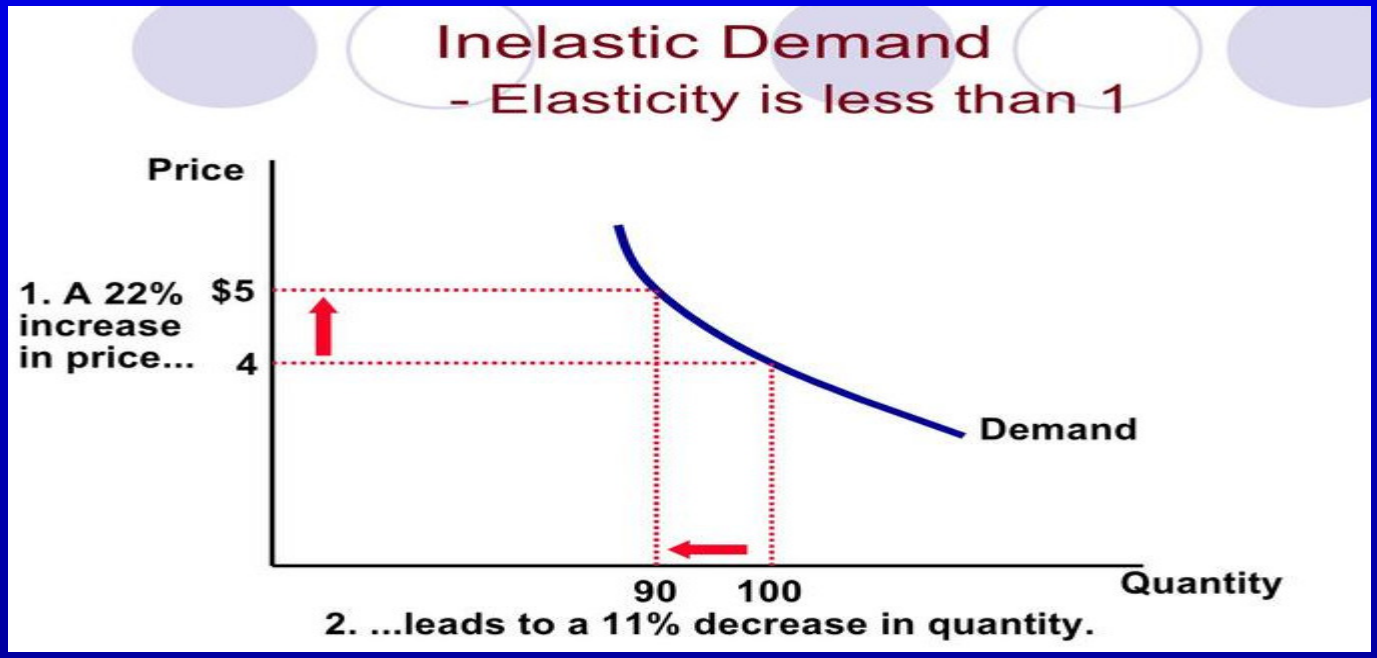
3. Unitary elastic demand

Unitary Elastic Demand: Demand for a commodity will be said to be unit elastic if the percentage change in quantity demanded equals the percentage change in price. If 22 percent change in price results in 22 percent change in demand, it is unit elastic demand



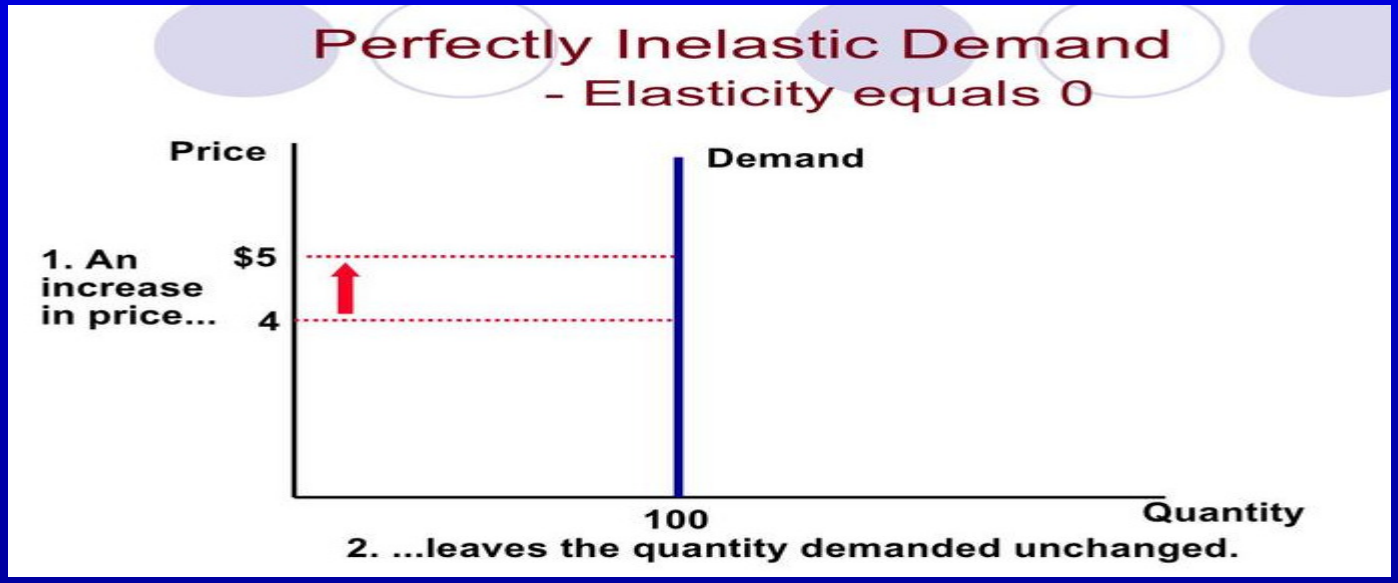
4.Relatively inelastic Demand

Inelastic or less than Unit Elastic Demand: Demand for commodity will be said to be inelastic (or less than unit elastic) if the percentage change in quantity demanded is less than the percentage change in price. If 22 percent change in price results in 11 percent change in demand, it is inelastic demand



5.Perfectly inelastic Demand

Perfectly Inelastic Demand: Demand for a commodity will be said to be perfectly inelastic, if the quantity demanded does not change at all in response to a given change in price. If 10 percent change in price results in zero percent change in demand, it is exactly inelastic demand. The demand curve, in this case, is vertical straight line perpendicular to Y-axis



Types of Elasticity

Hypothetical Demand Elasticities for Four Products

PRODUCT	% CHANGE IN PRICE ($\%\Delta P$)	% CHANGE IN QUANTITY DEMANDED ($\%\Delta Q_D$)	ELASTICITY ($\%\Delta Q_D \div \%\Delta P$)	
Insulin	+10%	0%	0.0	Perfectly inelastic
Basic telephone service	+10%	-1%	-0.1	Inelastic
Beef	+10%	-10%	-1.0	Unitarily elastic
Bananas	+10%	-30%	-3.0	Elastic

Measurement of price elasticity of demand

1. Percentage method or proportionate method
2. Arc method a. simple method b. modified or midpoint or adjustment method
3. point or geometrical method
4. Total outlay (total expenditure or total revenue)

1. Percentage method or proportionate method

According to this method, percentage change in price is compared with the percentage change in demand. Elasticity is the ratio of the percentage change in quantity demanded to the percentage change in price

$$Ep = \frac{\text{Percentage change in demand}}{\text{Percentage change in price}}$$

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

Ex 1 percentage or proportionate method .

The price elasticity of demand for milk is estimated to be -.5.

What effect does a 10% increase in the P_{milk} have on the quantity that individuals are willing to buy?

Since $e_p = -.5$

$$e_p \equiv \frac{\% \Delta Q}{\% \Delta P}$$

To solve for $\% \Delta Q$

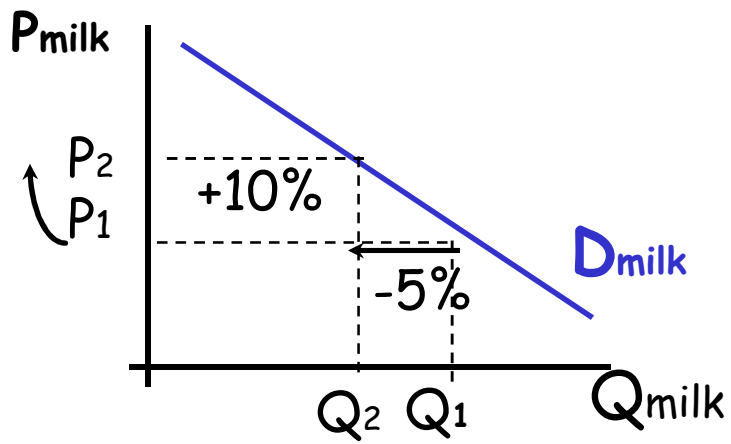
Multiply both sides by +10%

$-5\% = \quad \% \Delta Q$

A 10% increase in the price of milk would reduce the quantity demanded by about 5%.

If price were decreased by 5%, what would be the effect on quantity demanded?

A 10% increase in P reduces Q by 5%



Ex.2 If the price elasticity of demand for beef was estimated at -2.5, what effect would a 5% decrease in price have on quantity demanded ?

$$-2.5 = \frac{\% \Delta Q}{-5\%} = +12.5\% \text{ change in quantity demanded}$$

Ex.3 If the price elasticity of demand for chicken was estimated at -.8, What effect would a 6% increase in price have on quantity demanded ?

$$-.8 = \frac{\% \Delta Q}{+6\%} = -4.8\% \text{ decrease in quantity demanded}$$

1. Arc method

a. simple method

According to this method, percentage change in price is compared with the percentage change in demand. Elasticity is the ratio of the percentage change in quantity demanded to the percentage change in price

$$Ep = \frac{\text{Percentage change in demand}}{\text{Percentage change in price}}$$

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

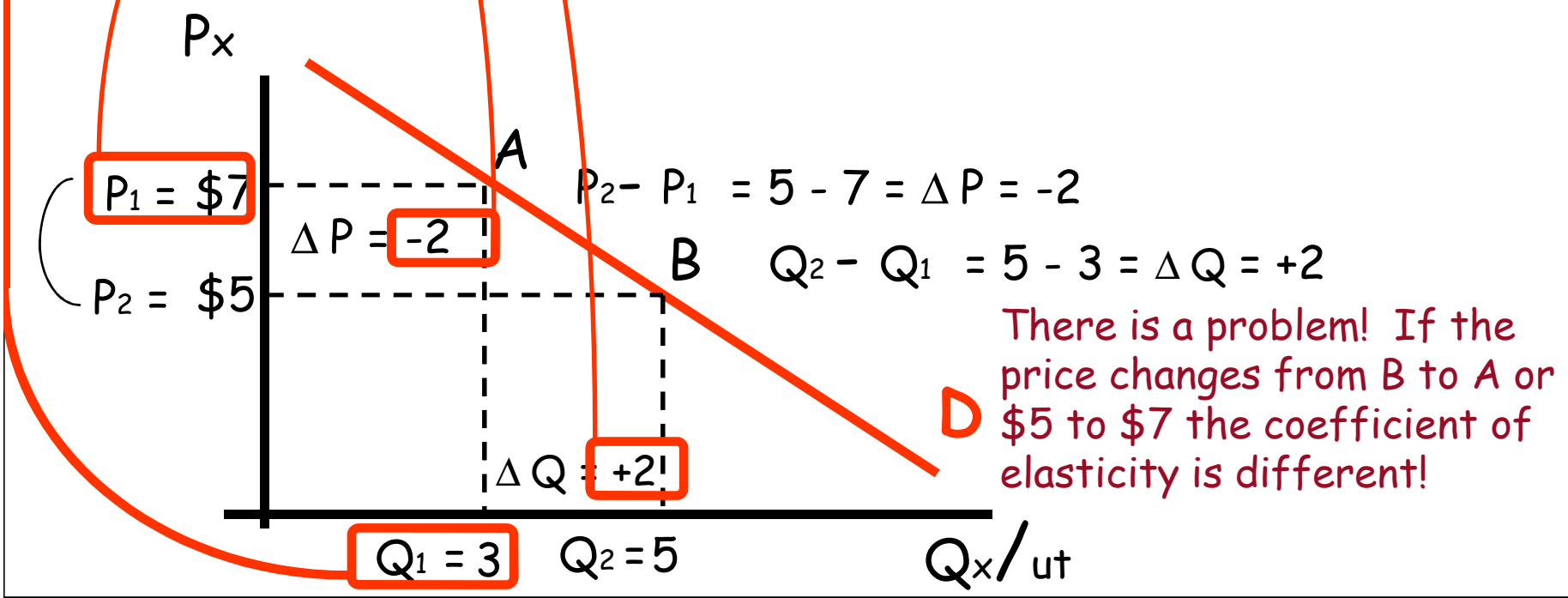
$$e_p = \frac{\frac{+2}{3}}{\frac{-2}{7}} = \frac{\%\,\Delta Q = 67\%}{\%\,\Delta P = -28.5\%} = -2.3 \text{ [rounded]}$$

[2/3 = .66667]

[-2/7=-.28571]

The price elasticity of demand from A to B is -2.3 [rounded]

Price decreases from A to B or $7 to $5



$P_2 - P_1 = 5 - 7 = \Delta P = -2$

$Q_2 - Q_1 = 5 - 3 = \Delta Q = +2$

There is a problem! If the price changes from B to A or $5 to $7 the coefficient of elasticity is different!

$$e_p = \frac{\frac{-2}{5}}{\frac{+2}{5}} = \frac{\%\ \Delta Q = -40\%}{\%\ \Delta P = 40\%} = -1$$

[-2/5 = -.4]

[+2/5 = .4]

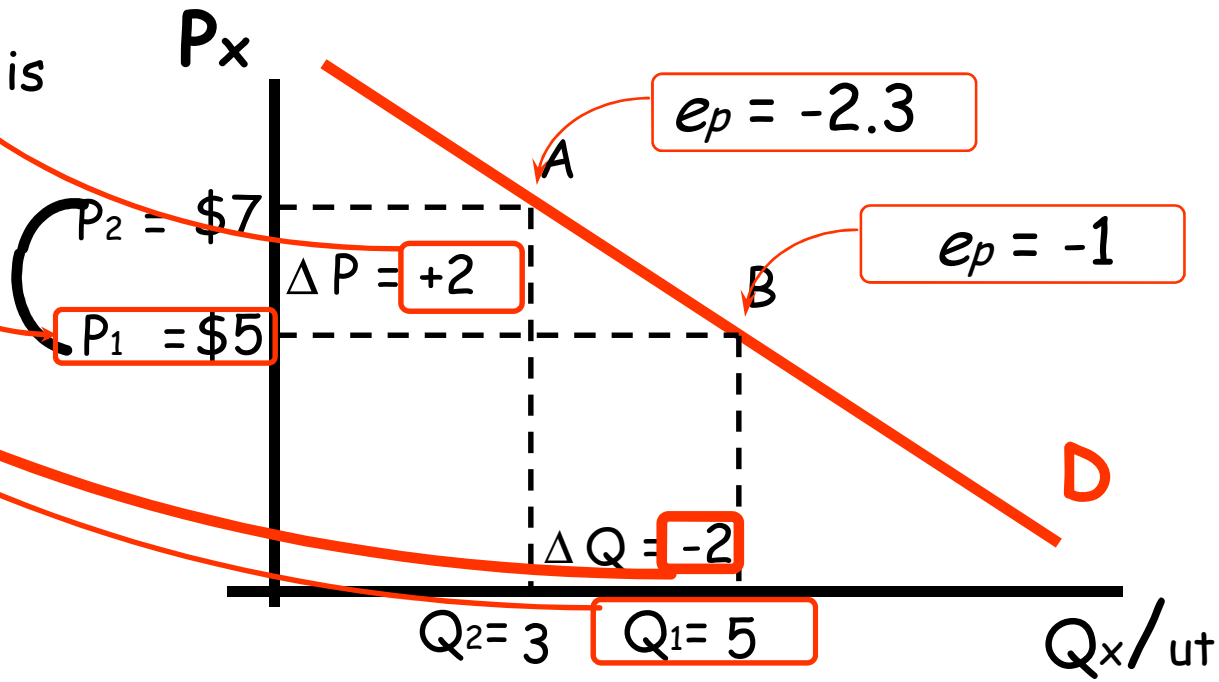
[this is called "unitary elasticity]

When the price elasticity calculated from B to A or the price increases from $5 to $7,

In the previous slide, when the price decreased from $7 to $5, $e_p = -2.3$

The point price elasticity is different at every point!

b. Mid point or adjustment method



b. The mid point or average method.

The formula to calculate the average or arc price elasticity is:

$$e_p = \frac{\Delta Q}{\Delta P} * \frac{P_1 + P_2}{Q_1 + Q_2}$$

$P_1 + P_2 = 12$

$P_1 = \$7,$ $P_2 = \$5,$

$Q_1 = 3$ $Q_2 = 5$

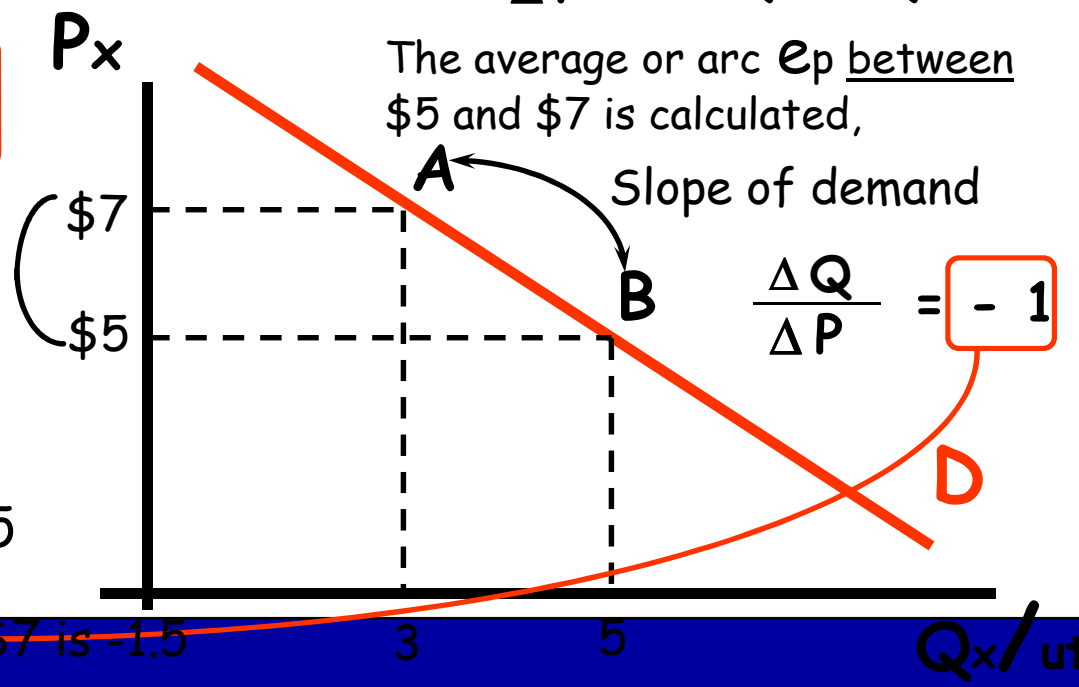
$Q_1 + Q_2 = 8$

$Q_2 - Q_1 = 5 - 3 = \Delta Q = +2$

$P_2 - P_1 = 5 - 7 = \Delta P = -2$

$$e_p = \frac{-1}{} * \frac{12}{8} = -1.5$$

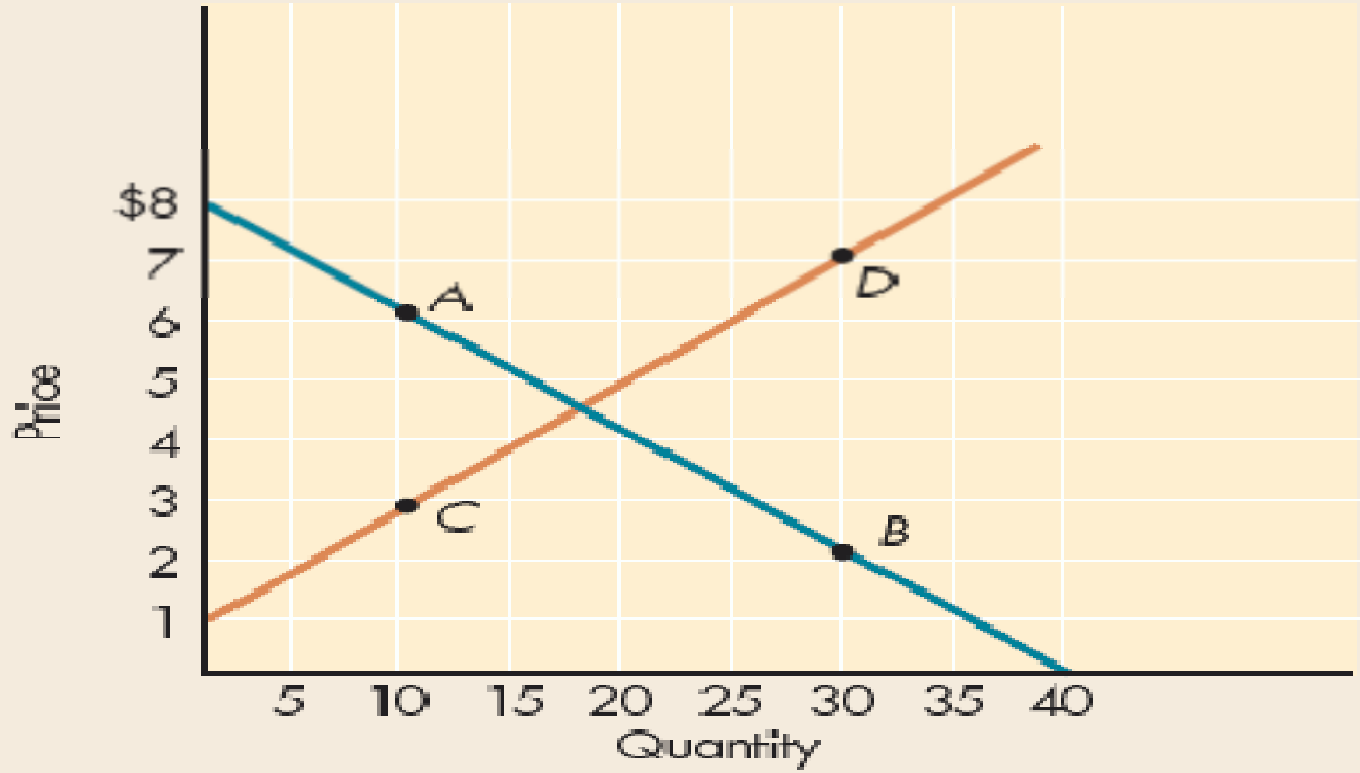
The average e_p between \$5 and \$7 is -1.5



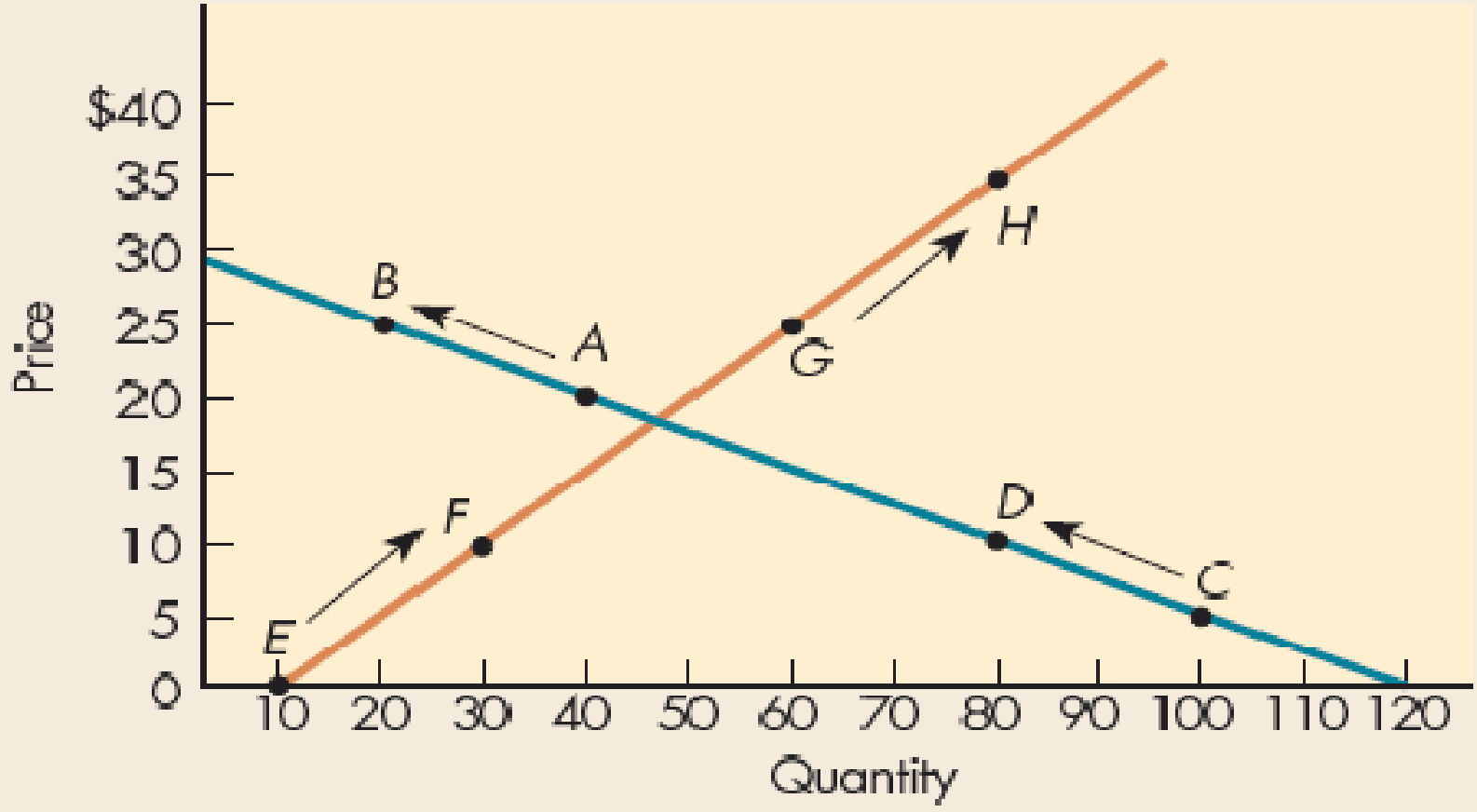
The average or arc e_p between \$5 and \$7 is calculated,

Slope of demand $\frac{\Delta Q}{\Delta P} = -1$

Calculate the price elasticities of the designated points on the following graph. (Reread the box "Calculating Elasticity at a Point.")



7. Calculate the elasticity of the designated ranges of supply and demand curves on the following graph.



1. Point or Geometric method

This method measures elasticity using demand curve. It is, therefore, also called as geometrical method of measuring elasticity. The diagram below illustrates how to find different types of elasticity on a demand curve. DD is the straight line demand curve (constant slope). Elasticity is measured as under

Geometric method or point method

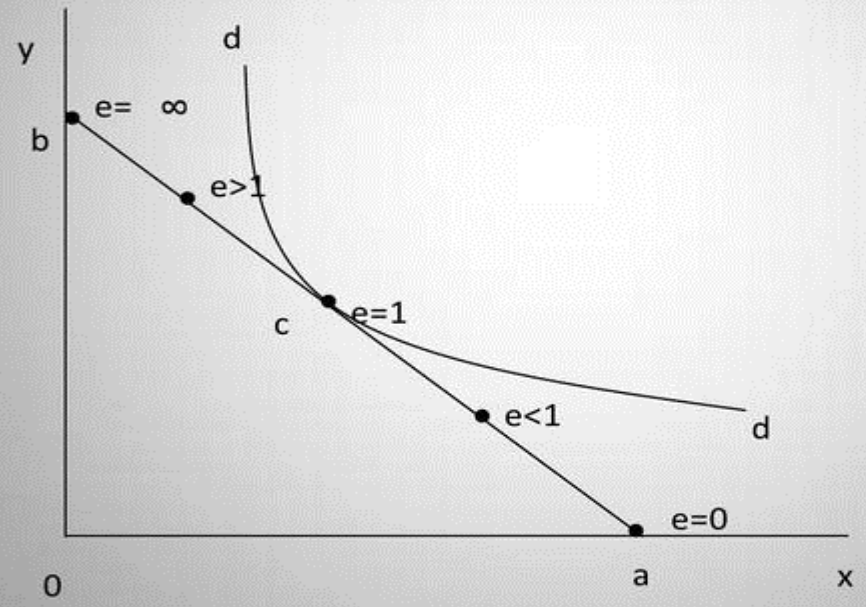
- This method attempts to measure numerical elasticity of demand at a particular point on the demand curve
- Price elasticity can be measure by following method

$$\text{Price elasticity of demand} = \frac{\text{Lower segment of the demand curve}}{\text{upper segment of the demand curve}}$$

1. Point or Geometric method

Geometric method or point method

- It can be shown in graph as following



Problem 1. The demand equation for a product is $Q_D = 50 - 2.25P$. Calculate the point-price elasticity of demand if $P = 2$.

solution

$$\varepsilon_p = \left(\frac{dQ_D}{dP}\right)\left(\frac{P}{Q_D}\right)$$

$$= -2.25\left(\frac{P}{50 - 2.25P}\right) = \frac{-2.25P}{50 - 2.25P}$$

$$= \frac{-2.25(2)}{50 - 2.25(2)} = \frac{-4.5}{45.5} = -0.099$$

***Problem 2.*.** Suppose that the demand equation for a product is $Q_D = 100 - 5P$. If the price elasticity of demand is -1, what are the corresponding price and quantity demanded?

solution

$$\varepsilon_p = \left(\frac{dQ_D}{dP}\right)\left(\frac{P}{Q_D}\right)$$

$$= -5\left(\frac{P}{100 - 5P}\right)$$

$$-1 = \frac{-5P}{100 - 5P}$$

$$5P - 100 = -5P$$

$$10P = 100$$

$$P = 10$$

$$Q_D = 100 - 5(10) = 50$$

4. Total Outlay/Expenditure Method

Elasticity of demand for a commodity can be measured with the help of the Total Outlay/expenditure incurred by a household on the purchase of a commodity. Total outlay is ($TQ = p \times q$) where TQ stands for total outlay, p and q for price and quantity respectively. This method provides us with three different measurements of the elasticity of demand, which are as follows:

(1) Less than Unit Elastic ($e < 1$)
(2) Unit Elastic ($e = 1$)
(3) More than Unit Elastic ($e > 1$)

According to this method, elasticity is measured by comparing the total money spent by the consumer on the goods before and after the changes in price. Elasticity can be measured for the following three situations:

1. Unit elasticity (e = 1): When the total money, outlay, or expenditure (TE) remains unchanged even after a change in the price of the commodity, elasticity is said to be unitary. Take for instance the following example, where TE remains the same. It is seen that when price falls to Rs 2 per unit, total expenditure does not change.

2. More than unit elastic (e > 1): When the total money expenditure rises with a fall in price and falls with a rise in price, it is the case of elasticity greater than one or elastic demand. This will be clear from the table. When price falls from Rs. 5 to Rs. 2 per unit, total expenditure rises from Rs. 50 to Rs. 60. Thus there is inverse relationship between price and total expenditure.

3. Inelastic demand (e < 1): When the total money expenditure rises with an increase in price and falls with a fall in price, it is the case of inelasticity of demand or elasticity less than one. The adjacent table shows this case. In this case, when price decreases, total expenditure also declines. Thus price and total expenditure have direct relationship.

4. Total Outlay/Expenditure Method

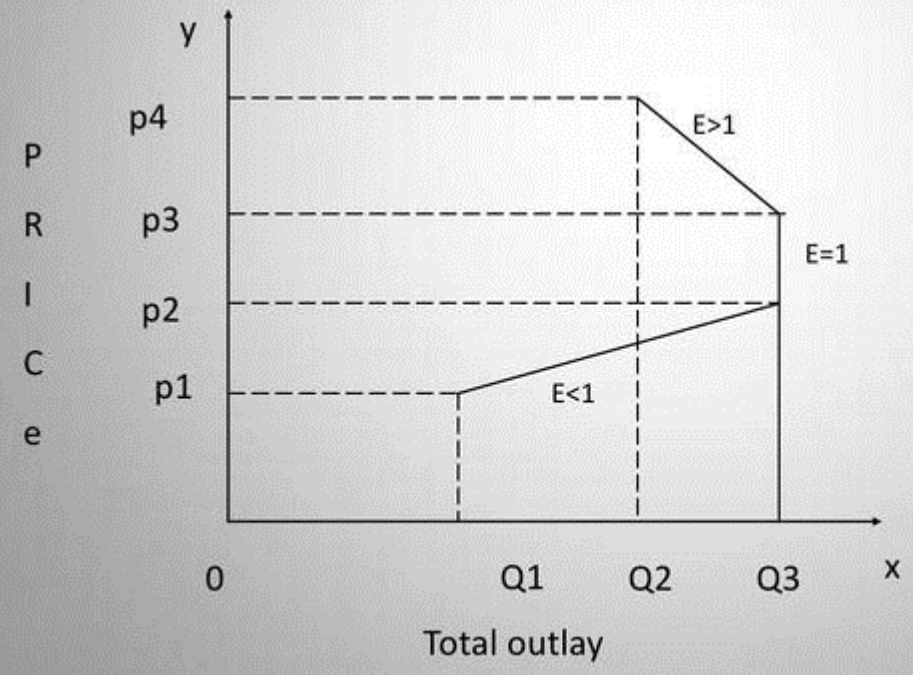
Total outlay method or total revenue method

- Total outlay means total expenditure and since total expenditure of consumers on a product implies total receipts or total revenue of sellers, it is known as total revenue method.
- It will be clear with following table

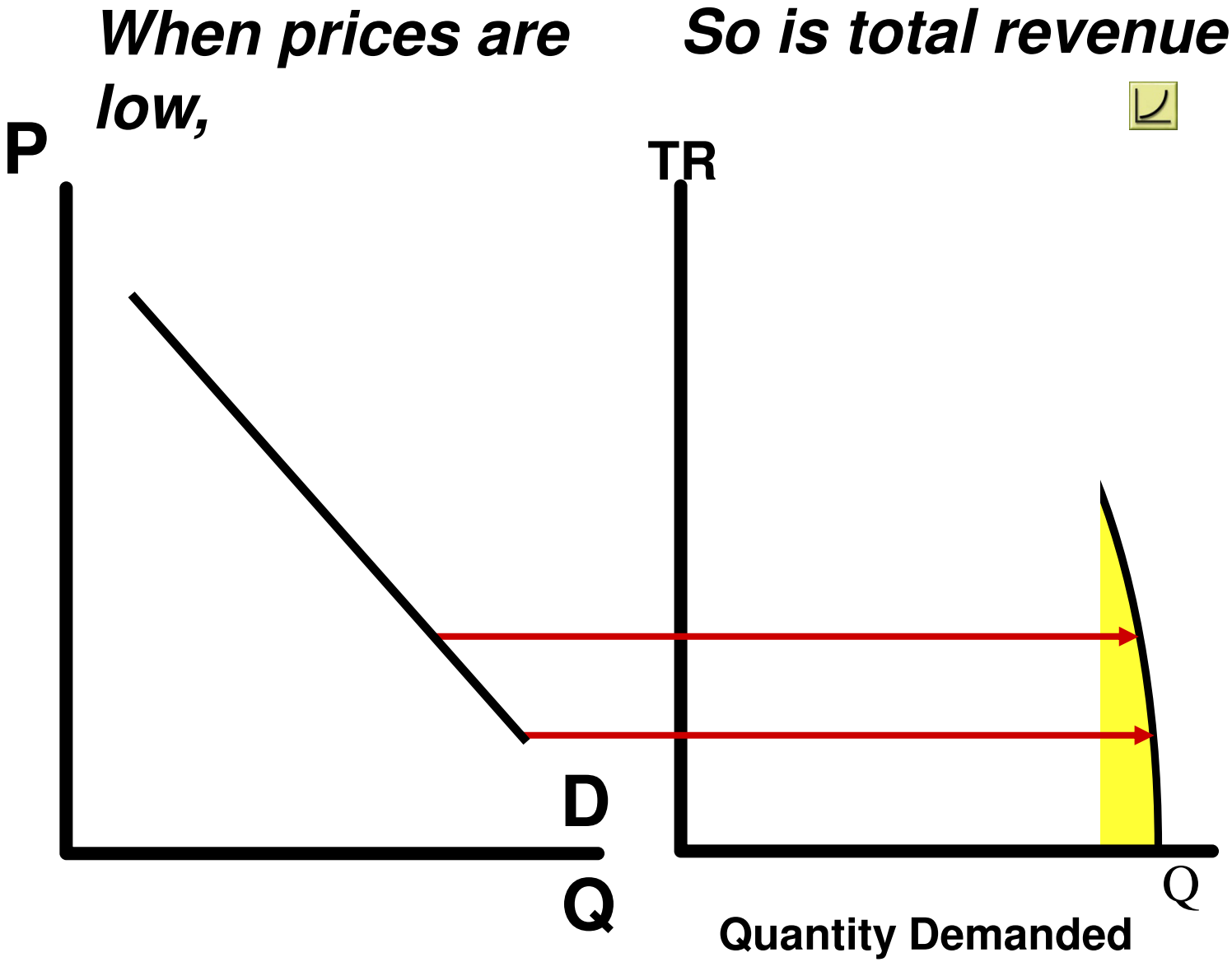
	price	quantity	Total outlay	Price elasticity
1	5	100	500	Elasticity of demand is greater than 1(e>1)
	4	130	520	
2	5	100	500	Elasticity of demand is less than 1(e<1)
	4	120	480	
3	5	100	500	Elasticity of demand is equal than 1(e=1)
	4	125	500	

4. Total Outlay/Expenditure Method

- This can be shown in graph as given



PRICE ELASTICITY & TOTAL REVENUE



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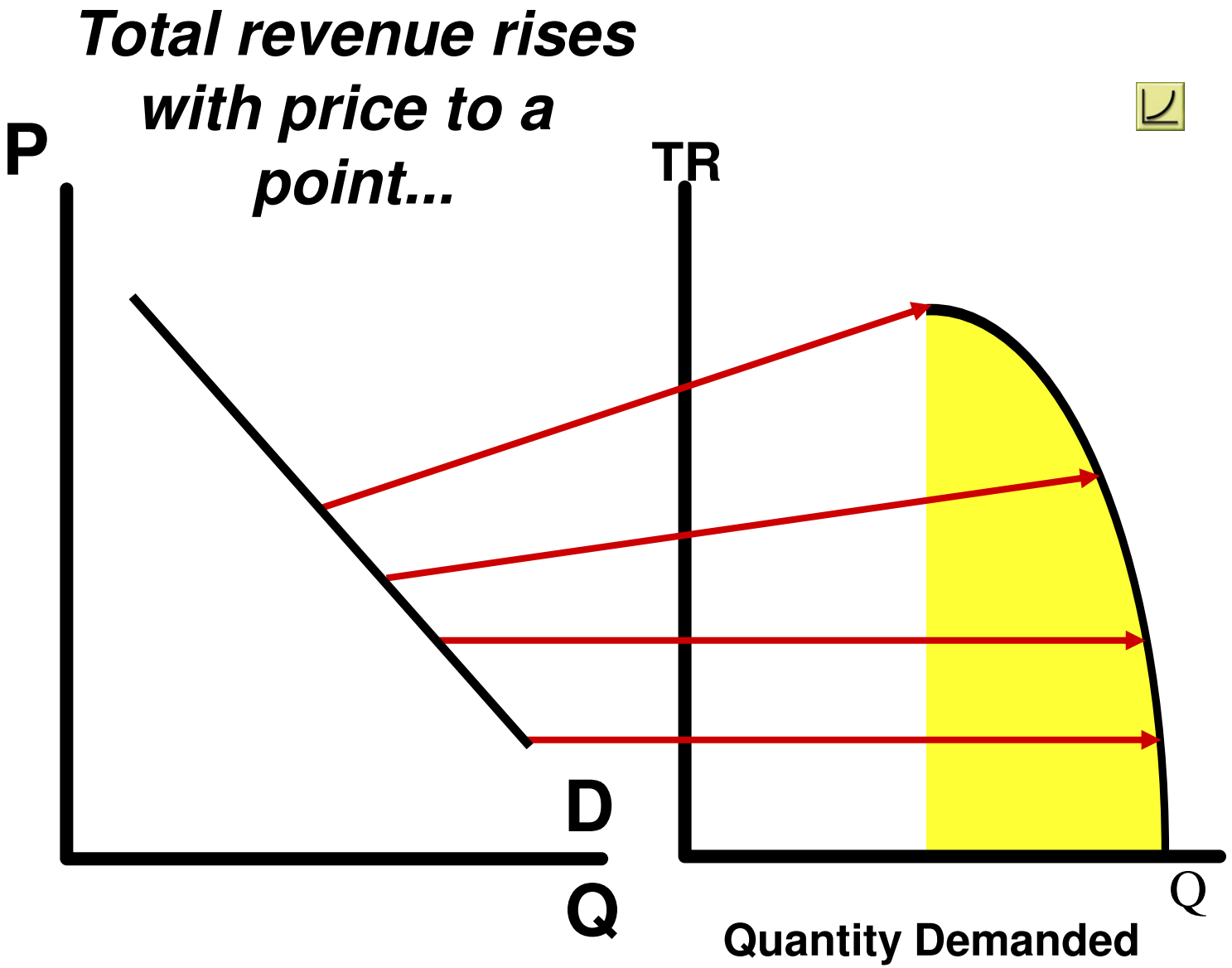

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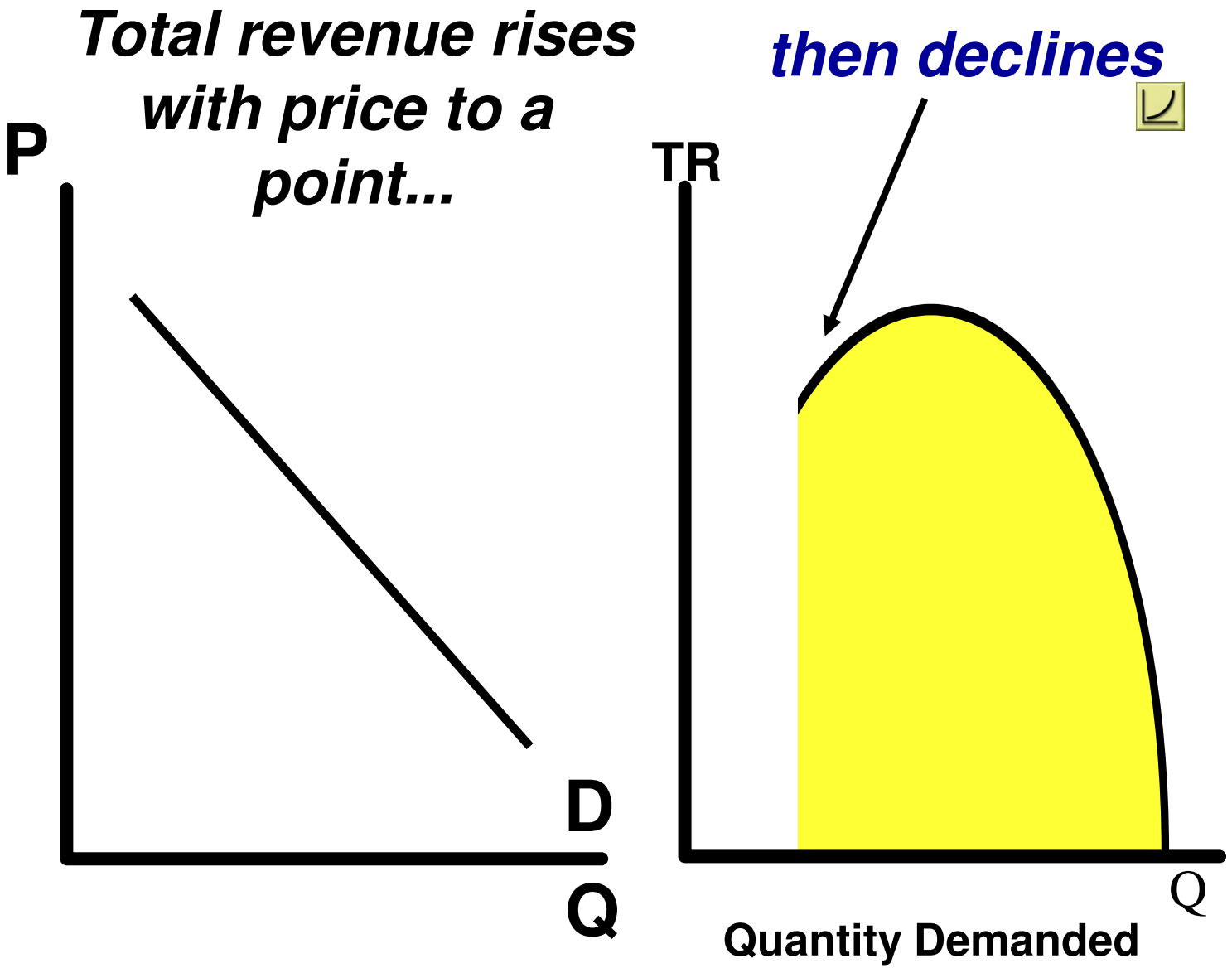

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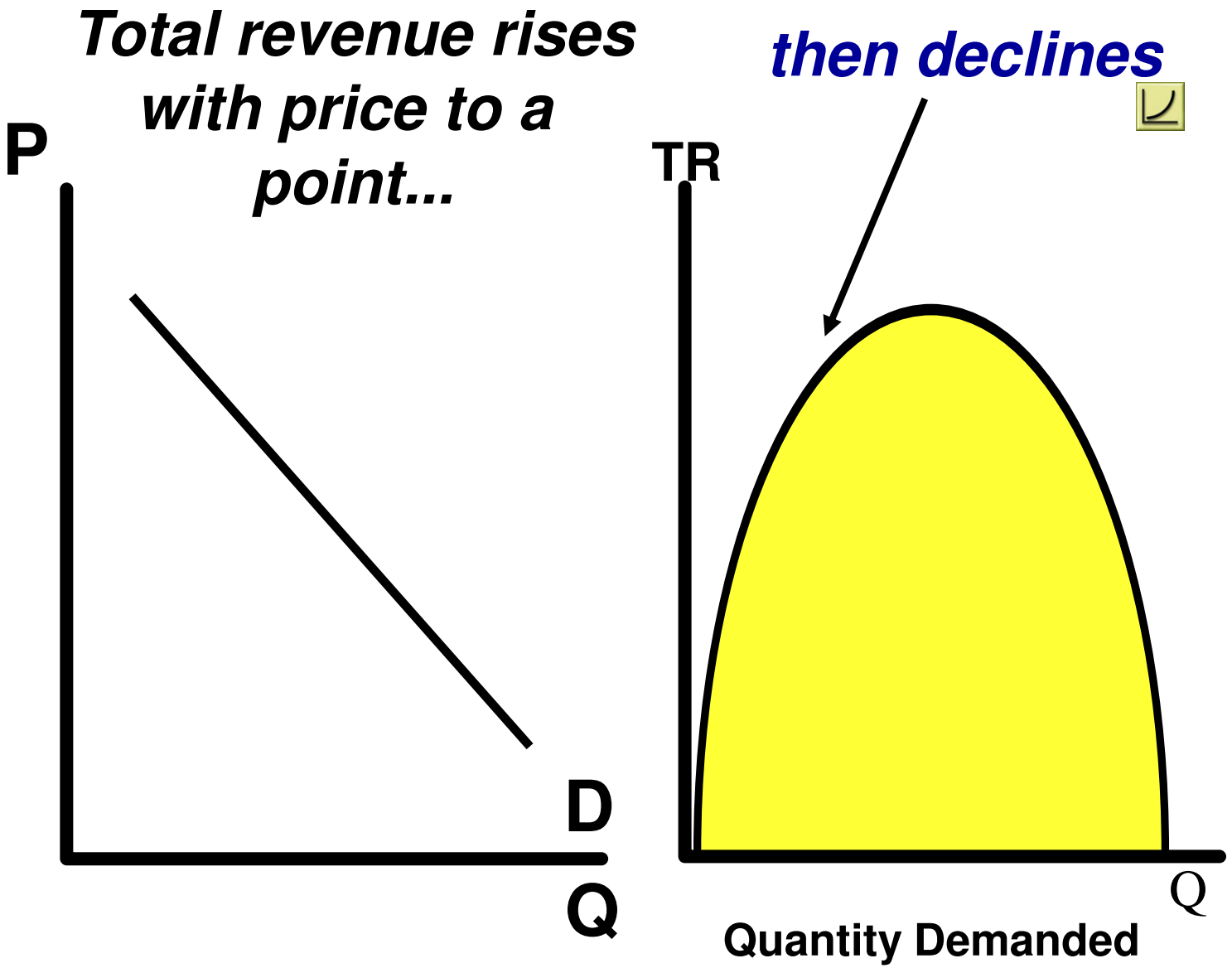
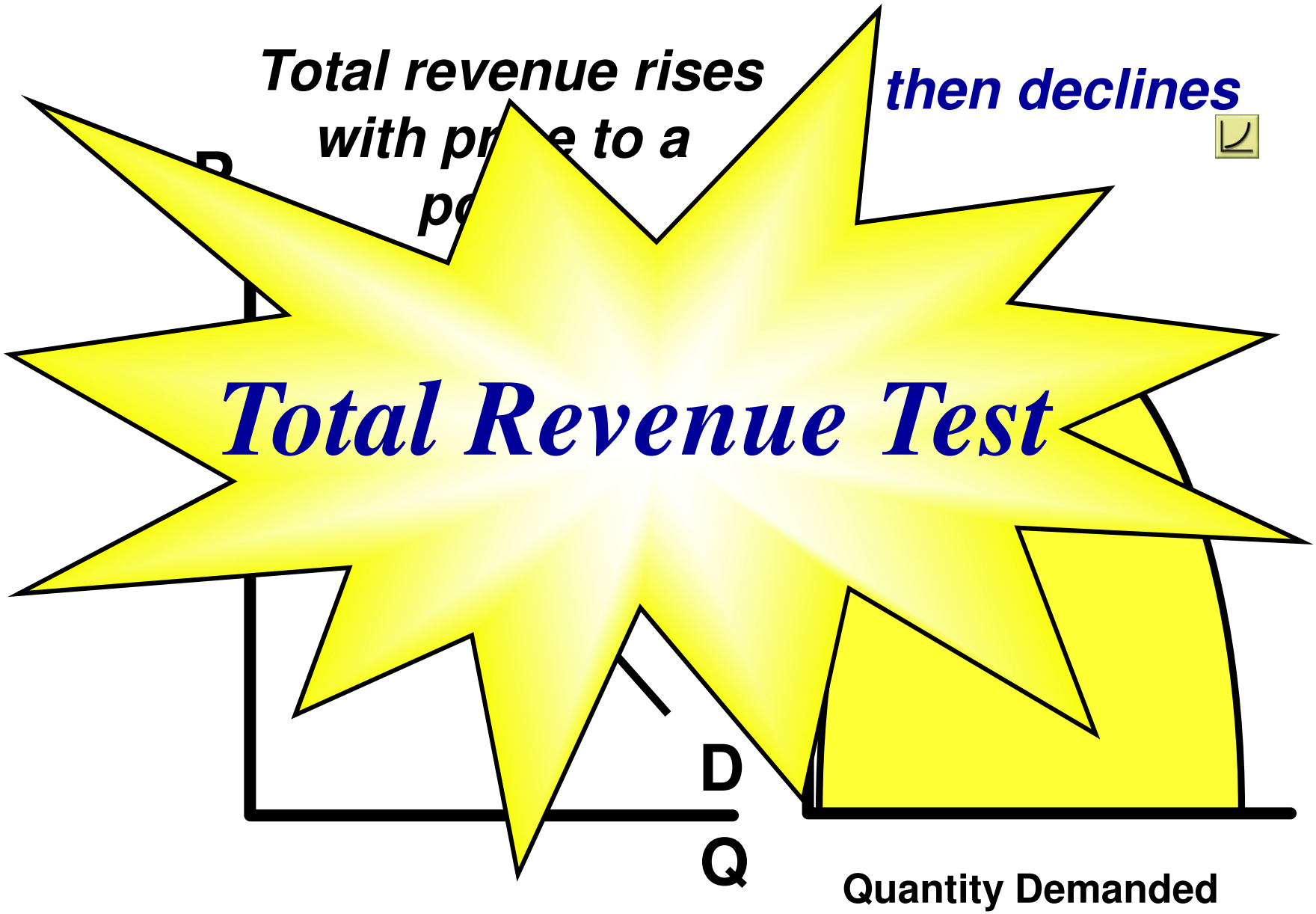


PRICE ELASTICITY & TOTAL REVENUE



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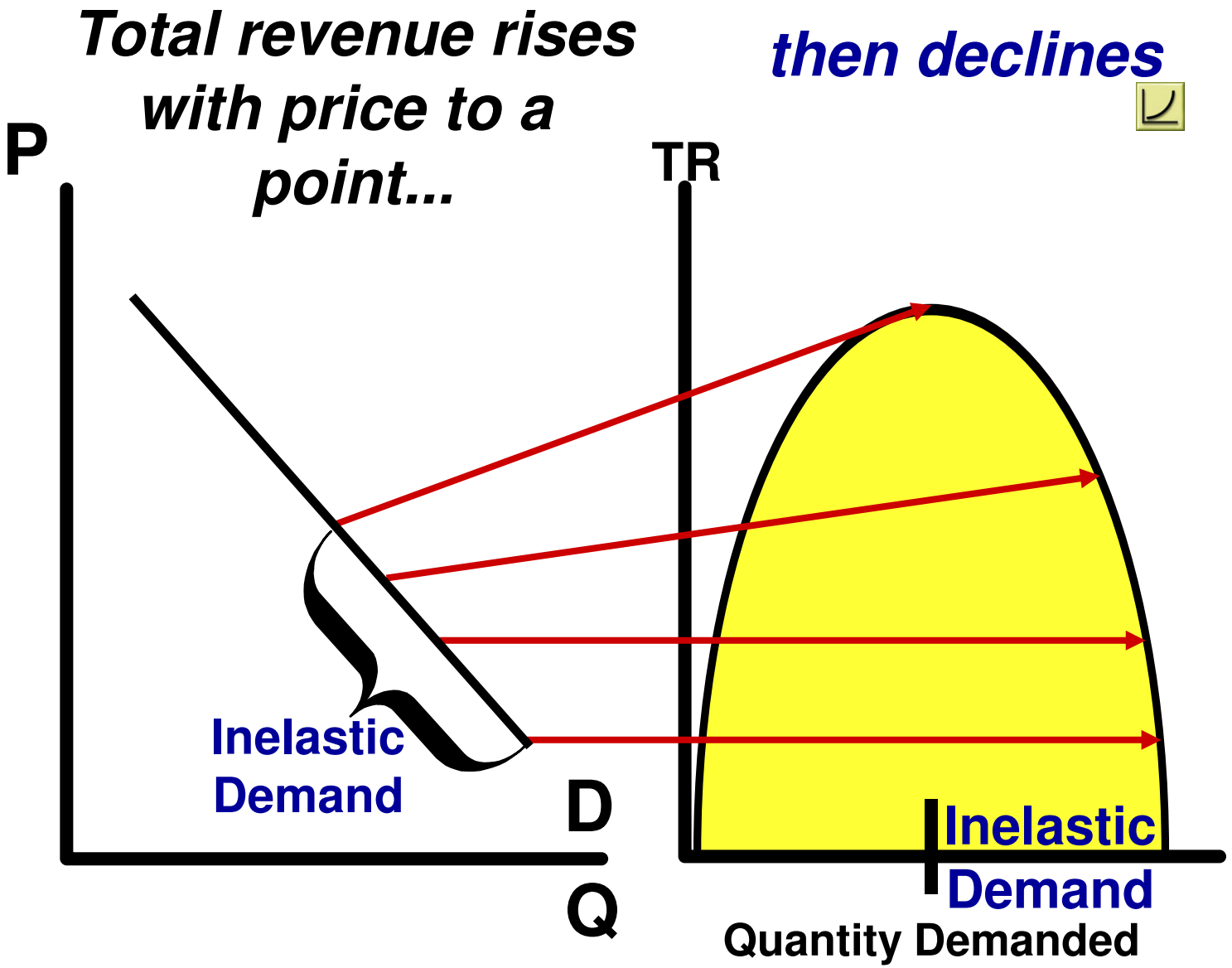

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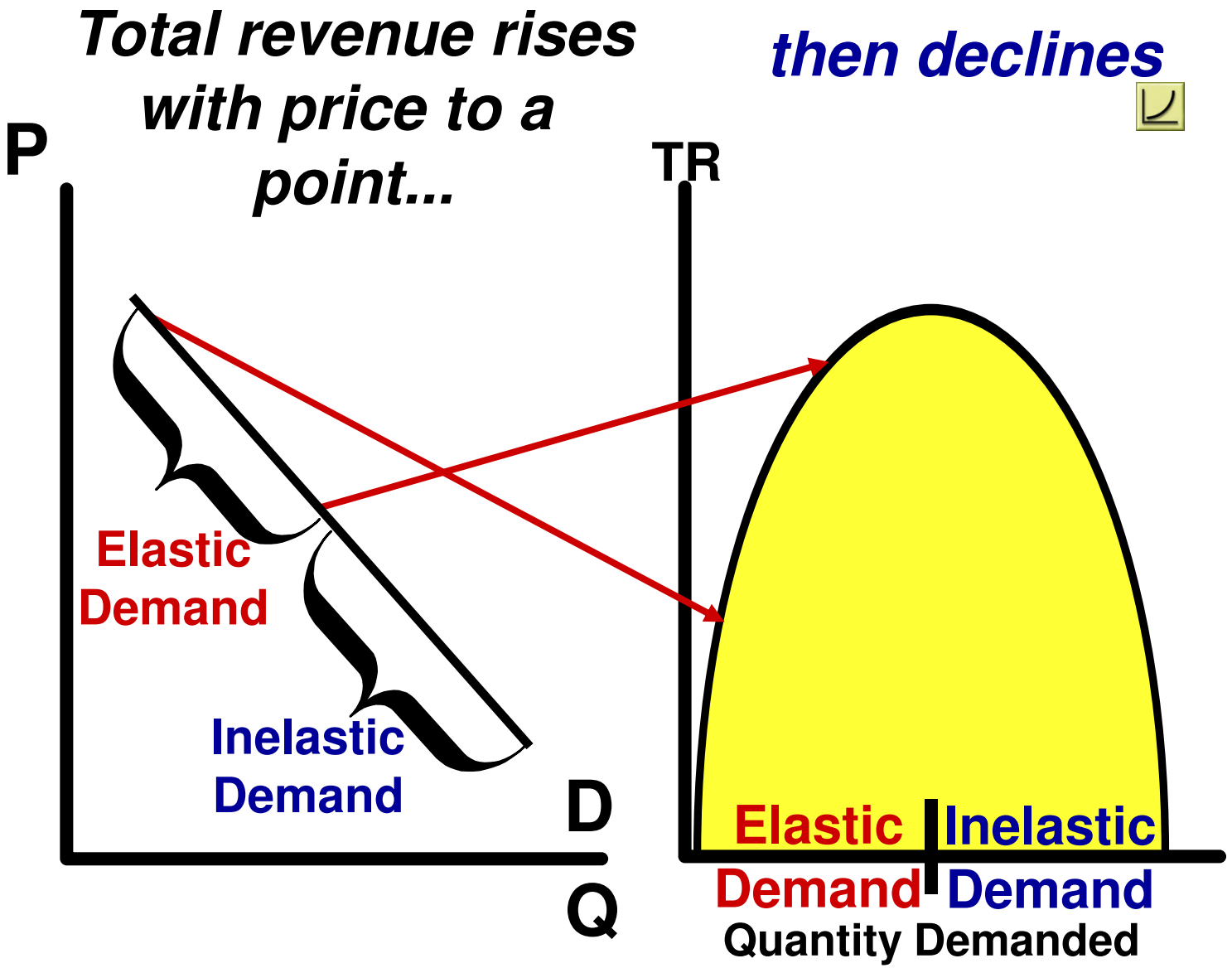
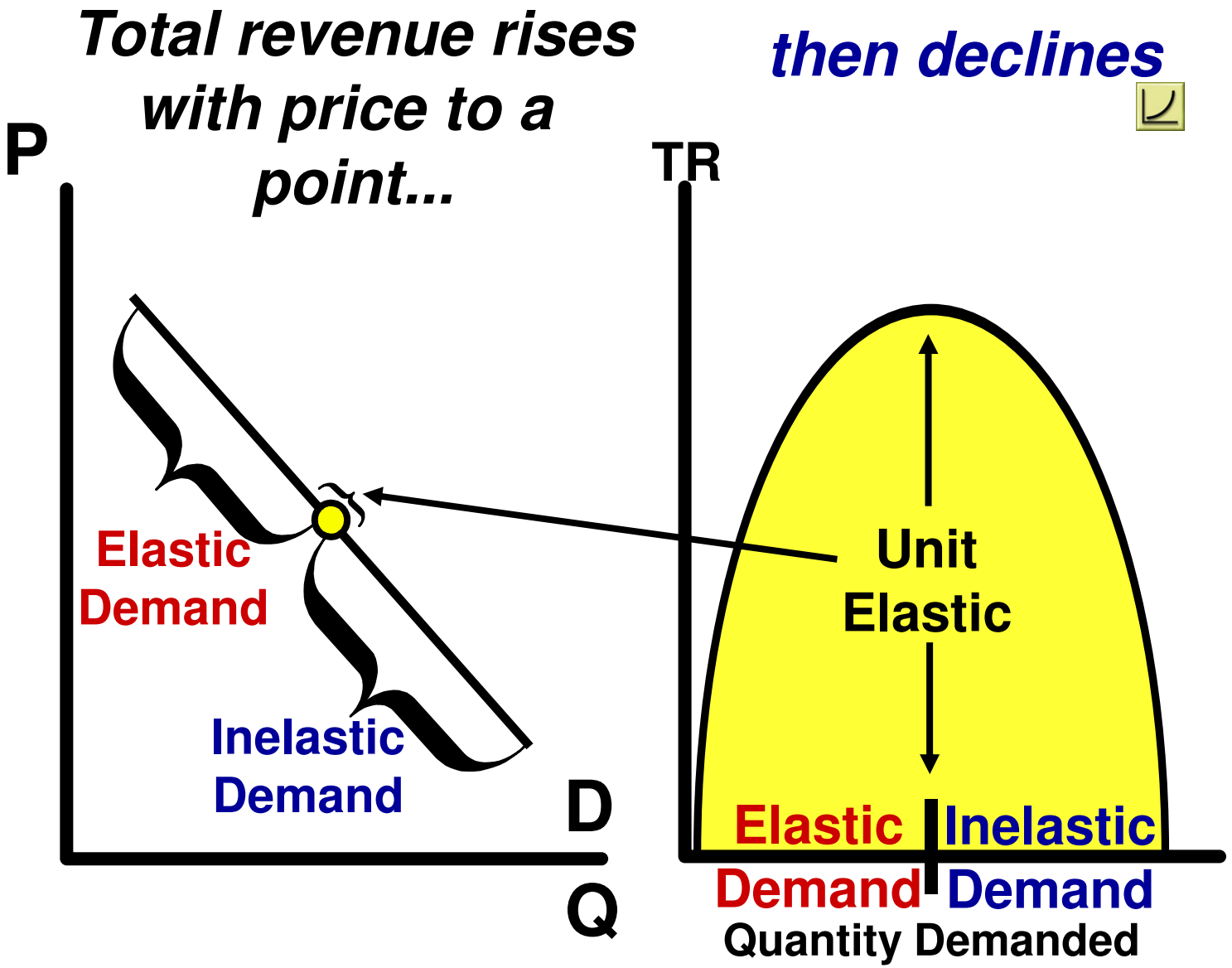


PRICE ELASTICITY & TOTAL REVENUE



The slope is -1

The intercept is 10

For a simple demand function: Q = 10 - 1P

price	quantity	ep	Total Revenue
$0	10	0	
$1	9	-.11	
$2	8	-.25	
$3	7	-.43	
$4	6	-.67	
$5	5	-1.	
$6	4	-1.5	
$7	3	-2.3	
$8	2	-4.	
$9	1	-9	
$10	0	undefined	

using our formula,

$$e_p = \frac{\Delta Q}{\Delta P} * \frac{P_1}{Q_1}$$

the slope is -1, price is 7

$$e_p = (-1) * \frac{7}{3} = -2.3$$

at a price of $7, Q = 3

Calculate e_p at P = $9

Q = 1

$$e_p = (-1)\ \frac{9}{1} = -9$$

Calculate e_p for all other price and quantity combinations.

For a simple demand function: Q = 10 - 1P			
price	quantity	e_p	Total Revenue
$0	10	0	0
$1	9	-.11	9
$2	8	-.25	16
$3	7	-.43	21
$4	6	-.67	24
$5	5	-1.	25
$6	4	-1.5	24
$7	3	-2.3	21
$8	2	-4.	16
$9	1	-9	9
$10	0	undefined	0

Notice that at higher prices the absolute value of the price elasticity of demand, $|e_p|$, is greater.

Total revenue is price times quantity; TR = PQ.
Where the total revenue [TR] is a maximum, $|e_p|$ is equal to 1

In the range where $|e_p| < 1$, [less than 1 or "inelastic"], TR increases as price increases, TR decreases as P decreases.

In the range where $|e_p| > 1$, [greater than 1 or "elastic"], TR decreases as price increases, TR increases as P decreases.

Given: Q = 120 - 4 P			
Price	Quantity	e_p	TR
$ 10			
$ 20			
$ 25			
$ 28			

Calculate the point e_p at each price on the table.

Calculate the TR at each price on the table.

Calculate arc e_p at between $10 and $20.

Calculate arc e_p at between $25 and $28.

Calculate arc e_p at between $20 and $28.

Graph the demand function [labeling all axis and functions], identify which ranges on the demand function are price elastic and which are price inelastic.

Given: Q = 120 - 4 P			
Price	Quantity	e_p	TR
$ 10	80	- . 5	$800
$ 20	40	-2	$800
$ 25	20	-5	$500
$ 28	8	-14	$224

Calculate the point e_p at each price on the table.

Calculate the TR at each price on the table. TR = PQ

Calculate arc e_p at between $10 and $20. $e_p = -1$

Calculate arc e_p at between $25 and $28. $e_p = -7.6$

Calculate arc e_p at between $20 and $28. $e_p = -4$

Graph the demand function [labeling all axis and functions], identify which ranges on the demand function are price elastic and which are price inelastic. At what price will TR by maximized? P = $15

Determinants of Price Elasticity:

There are several determinants of the price elasticity of demand.

1. Substitutes for the product: **Generally, the more substitutes, the more elastic the demand.**
2. The proportion of price relative to income: **Generally, the larger the expenditure relative to one's budget, the more elastic the demand, because buyers notice the change in price more.**
3. luxury vs. Necessity products: **Generally, the less necessary the item, the more elastic the demand.**
4. Time factor: **Generally, the longer the time period involved, the more elastic the demand becomes.**

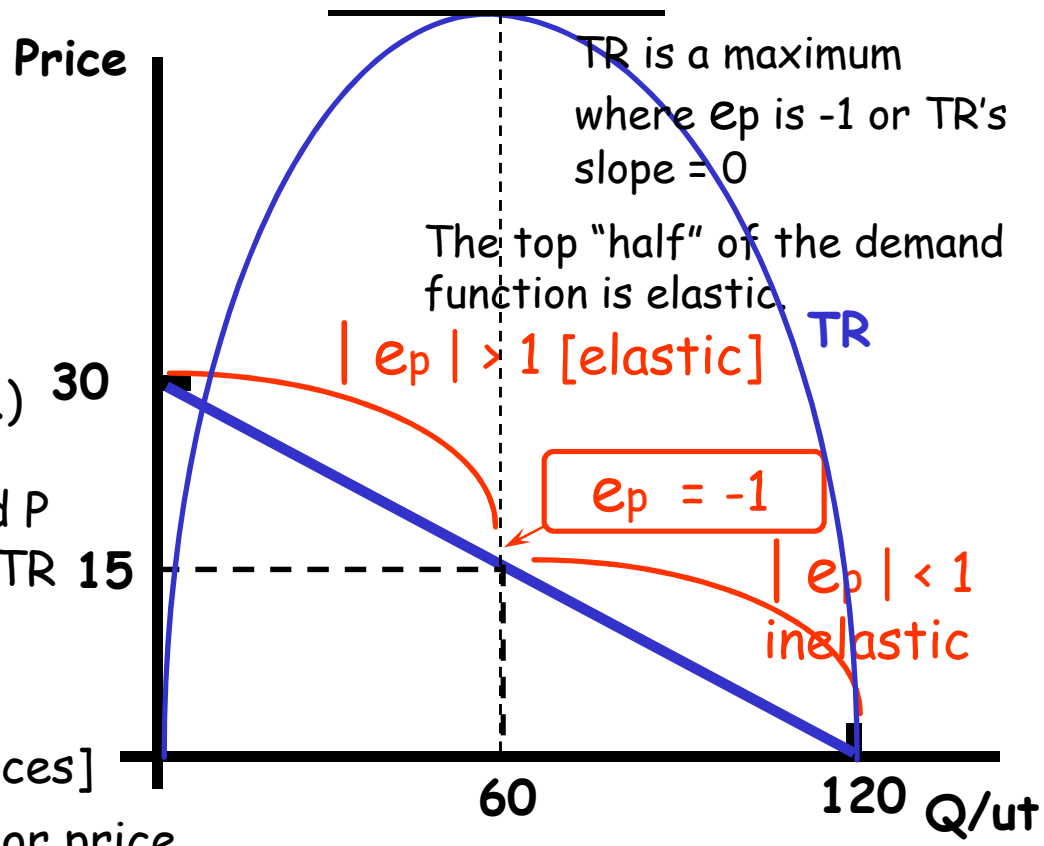
Graphing Q = 120 - 4 P,

When e_p is -1 TR is a maximum.
When $|e_p| > 1$ [elastic], TR and P move in opposite directions. (P has a negative slope, TR a positive slope.)

When $|e_p| < 1$ [inelastic], TR and P move in the same direction. (P and TR both have a negative slope.)

Arc or average e_p is the average elasticity between two point [or prices]

point e_p is the elasticity at a point or price.



The bottom "half" of the demand function is inelastic.

Price elasticity of demand describes how responsive buyers are to change in the price of the good. The more "elastic," the more responsive to ΔP.

If the price elasticity of demand for milk were -.5, the effects of a price change on total revenue [TR] can also be estimated.

Since ,

$$e_p \equiv \frac{\% \Delta Q}{\% \Delta P}$$

When $|e_p| < 1$, demand is "inelastic. " This means that the $|\% \Delta Q| < |\% \Delta P|$. Since the % price decrease is greater than the % increase in Q, TR [TR = PQ] will decrease.

When $|e_p| < 1$, a price decrease will decrease TR; a price increase will increase TR, Price and TR "move in the same direction." [inelastic demand with respect to price]

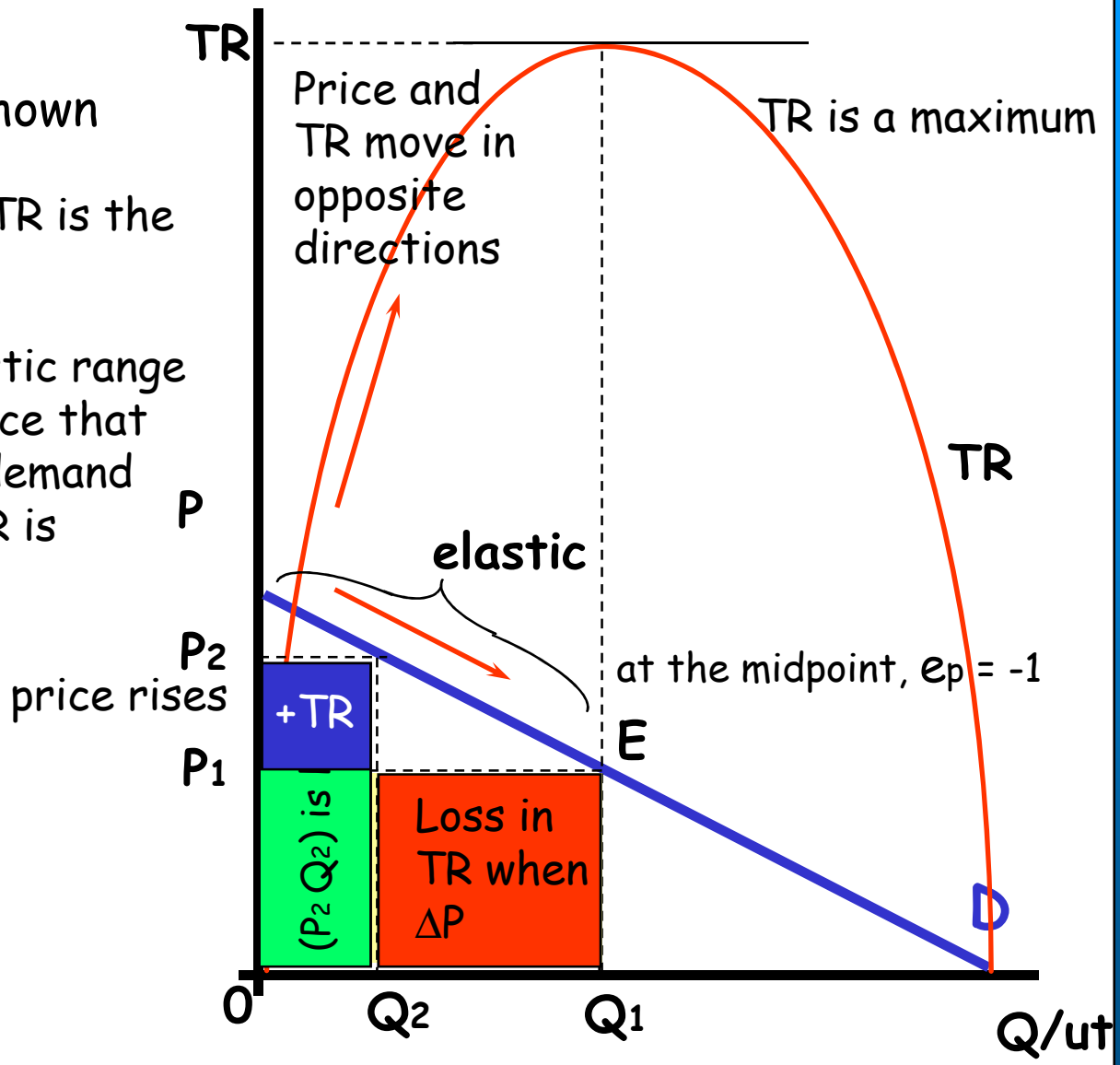
When $|e_p| > 1$, demand is "elastic." This means that the $|\% \Delta Q| > |\% \Delta P|$. When the % price decrease is less than the % increase in Q, TR [TR = PQ] will increase.

When $|e_p| > 1$, a price decrease will increase TR; a price increase will decrease TR, price and TR "move in opposite directions." [elastic demand wrt price]

Graphically this can be shown

TR = PQ, so the maximum TR is the rectangle $0Q_1EP_1$

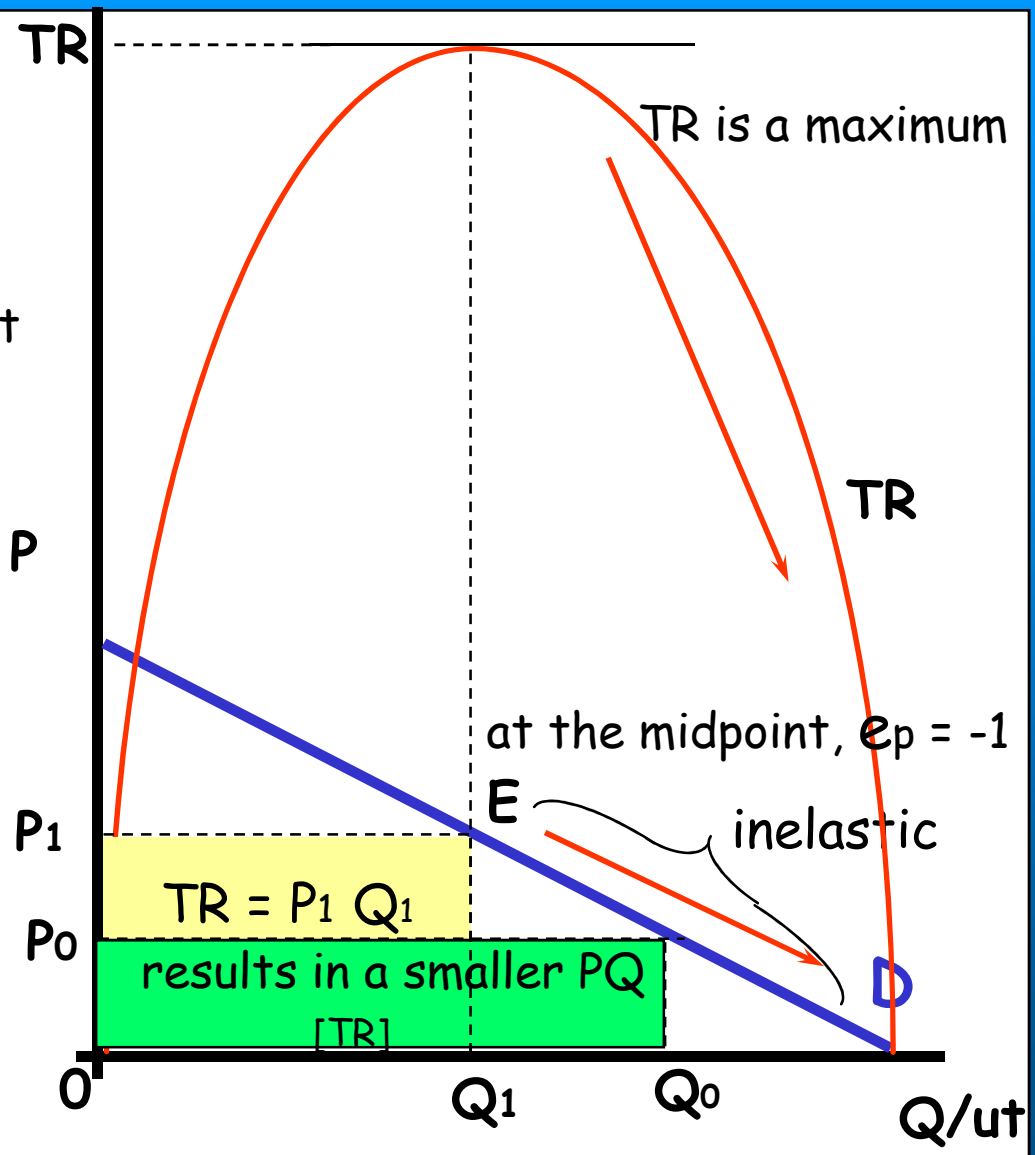
As price rises into the elastic range the TR will decrease. Notice that in this range the slope of demand is negative, the slope of TR is positive



When price elasticity of demand is inelastic

A price decrease will result in a decrease in TR [PQ]. notice that both TR and Demand have a negative slope in the inelastic range of the demand function. Price and TR "move in the same direction."

A price decrease will reduce TR; a price increase will increase TR. Note that this information is useful but does not provide information about profits!



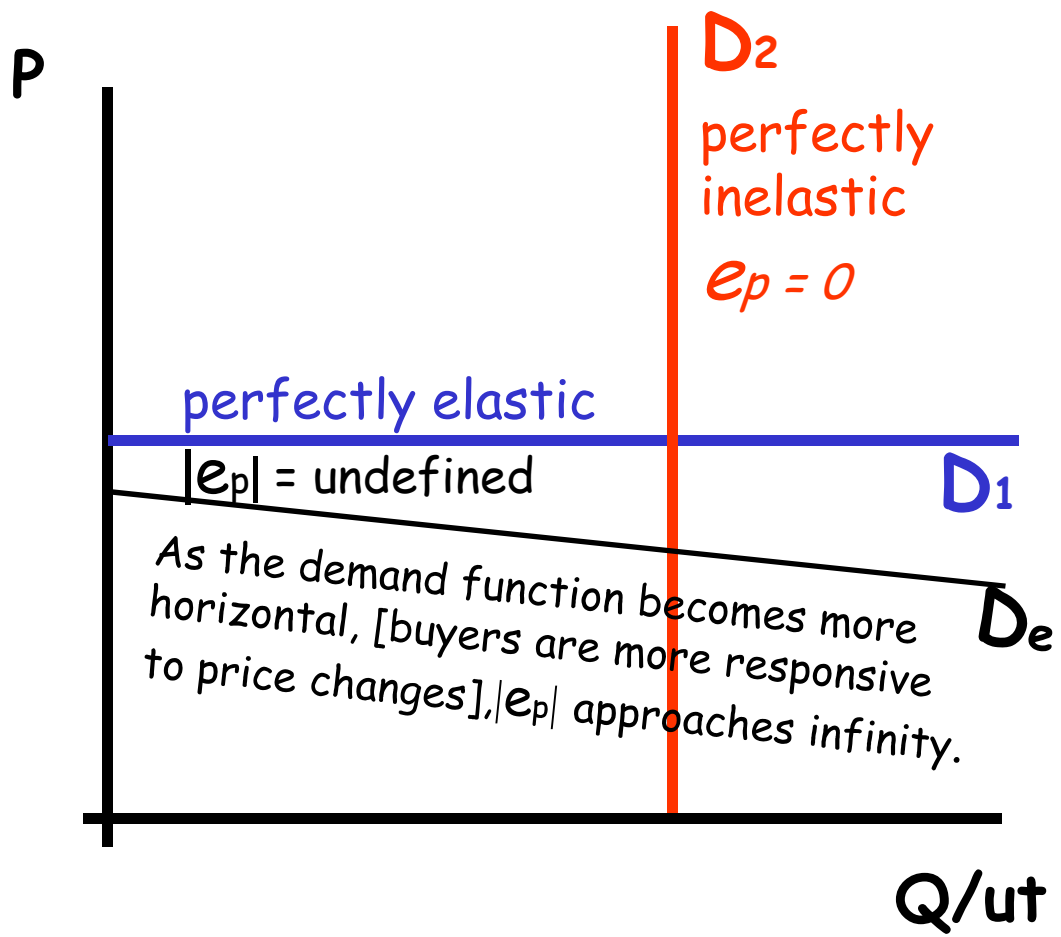
Inelastic e_p

- When $|e_p| < 1$ [less than 1] the demand is "inelastic"
  - The $|\%\Delta Q| < |\%\Delta P|$, buyers are not very responsive to changes in price.
- An increase in the price of the good results in an increase in total revenue [TR], a decrease in the price decreases TR. Price and TR move in the same direction

D_1 is a "perfectly elastic" demand function.

For an infinitesimally small change in price, Q changes by infinity. Buyers are very responsive to price changes. An infinitely small change in price changes Q by infinity.

$$e_p \equiv \frac{0}{\Delta P \rightarrow 0} = 0$$



D_2 is a "perfectly inelastic" demand function, no matter how much the price changes the same amount is bought. Buyers are <u>not</u> responsive to price changes! $|e_p| = 0$, perfectly inelastic.

Examples

- Goods that are relatively price elastic
  - lamb, restaurant meals, china/glassware, jewelry, air travel [LR], new cars, Fords
  - in the long run, $|e_p|$ tends to be greater
- Goods that are relatively price inelastic
  - electricity, gasoline, eggs, medical care, shoes, milk
  - in the short run, $|e_p|$ tends to be less

Income Elasticity
[normal goods]

$$e_y \equiv \frac{\% \Delta Q_x}{\% \Delta Y}$$

[Where Y = income]

Income elasticity is a measure of the change in demand [a "shift" of the demand function] that is "caused" by a change in income.

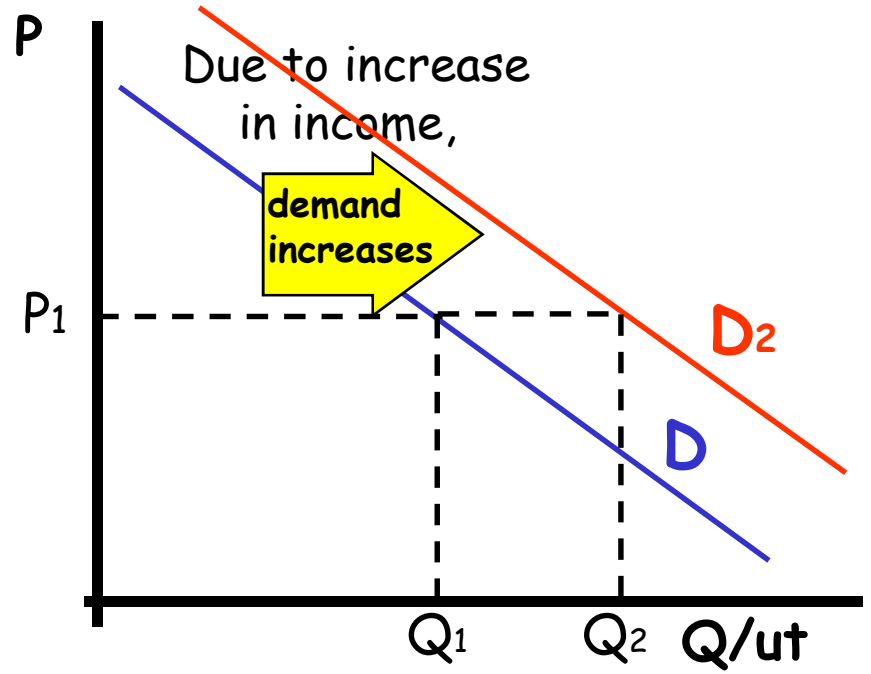
The increase in income, ΔY, increases demand to D_2. The increase in demand results in a larger quantity being purchased at the same Price [P_1]..

At a price of P_1, the quantity demanded given the demand D is Q_1. D is the demand function when the income is Y_1.

For a "normal good" an increase in income to Y_2 will "shift" the demand to the right. This is an increase in demand to D_2.

$\% \Delta Y > 0$; $\% \Delta Q > 0$; therefore,

$e_y > 0$ [it is positive]



Income Elasticity [continued. . .]

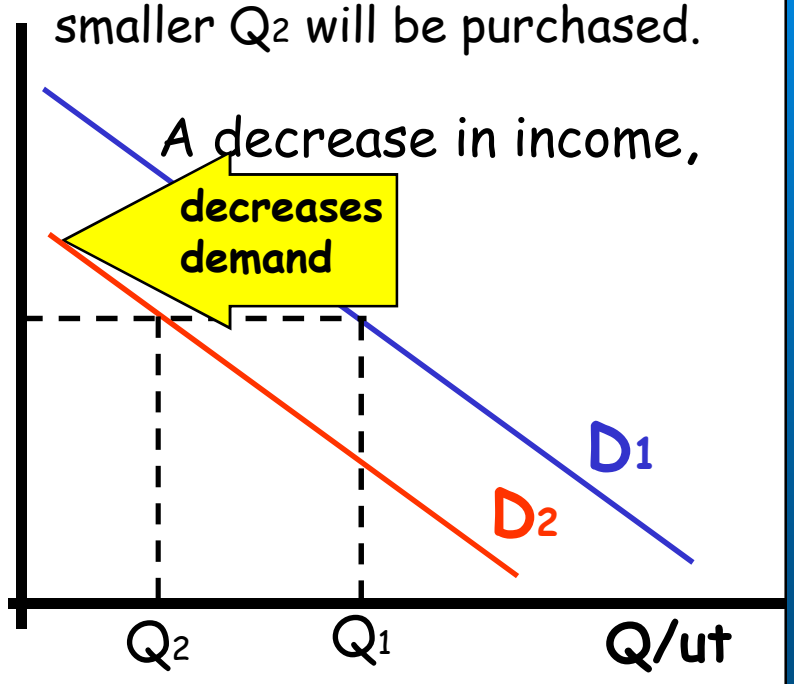
[normal goods]

$$e_y \equiv \frac{\% \Delta Q_x}{\% \Delta Y}$$

A decrease in income is associated with a decrease in the demand for a normal good.

At income Y_1, the demand D_1 represents the relationship between P and Q. At a price [P_1] the quantity [Q_1] is demanded.

For a decrease in income [$-\Delta Y$], the demand decreases; i.e. shifts to the left, at the price [P_1], a smaller Q_2 will be purchased.



$\% \Delta Y < 0$ [negative]; $\% \Delta Q < 0$ [negative];

so, $e_p > 0$ [positive]

For either an increase or decrease in income the e_p is positive. A positive relationship [positive correlation] between ΔY and ΔQ is evidence of a normal good.

When income elasticity is positive, the good is considered a "normal good." An increase in income is correlated with an increase in the demand function. A decrease in income is associated with a decrease in the demand function.

For both increases and decreases in income, e_y is positive

The greater the value of e_y, the more responsive buyers are to a change in their incomes.

$$+ e_y \equiv \frac{- \% \Delta Q_x}{- \% \Delta Y}$$

When the value of e_y is greater than 1, it is called a "superior good."

The $|\% \Delta Q_x|$ is greater than the $|\% \Delta Y|$. Buyers are very responsive to changes in income. Sometimes "superior goods" are called "luxury goods."

$$e_y \equiv \frac{\% \Delta Q_x}{\% \Delta Y}$$

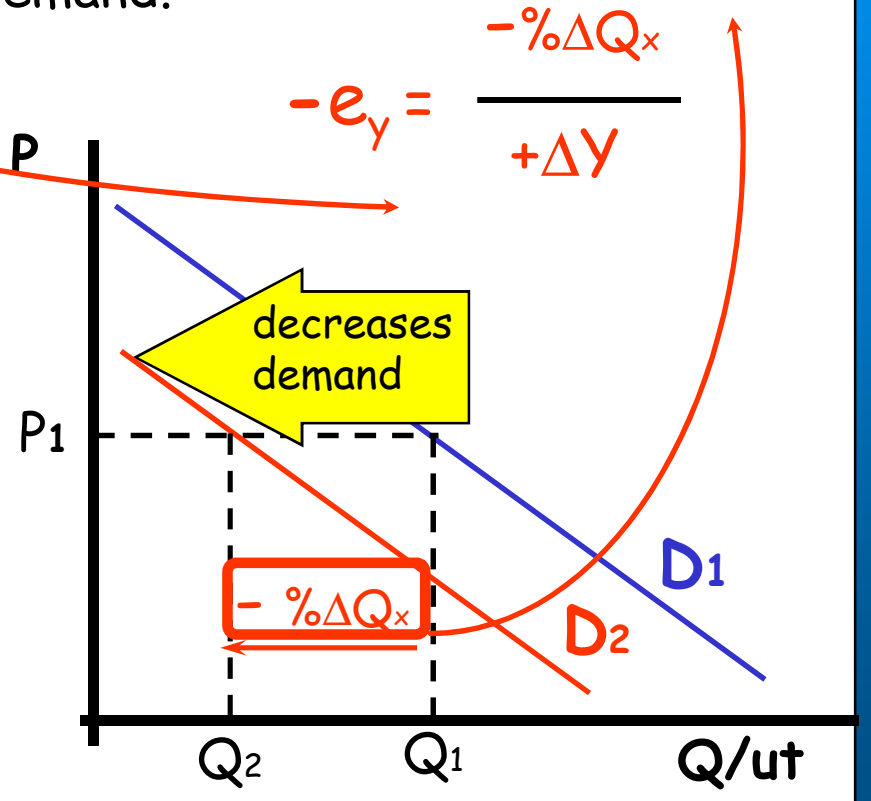
Income Elasticity
[inferior goods]

There is another classification of goods where changes in income shift the demand function in the "opposite" direction.

An increase in income [$+\Delta Y$] reduces demand.

An increase in income reduces the amount that individuals are willing to buy at each price of the good. Income elasticity is negative: $-e_y$

The greater the absolute value of $-e_y$, the more responsive buyers are to changes in income



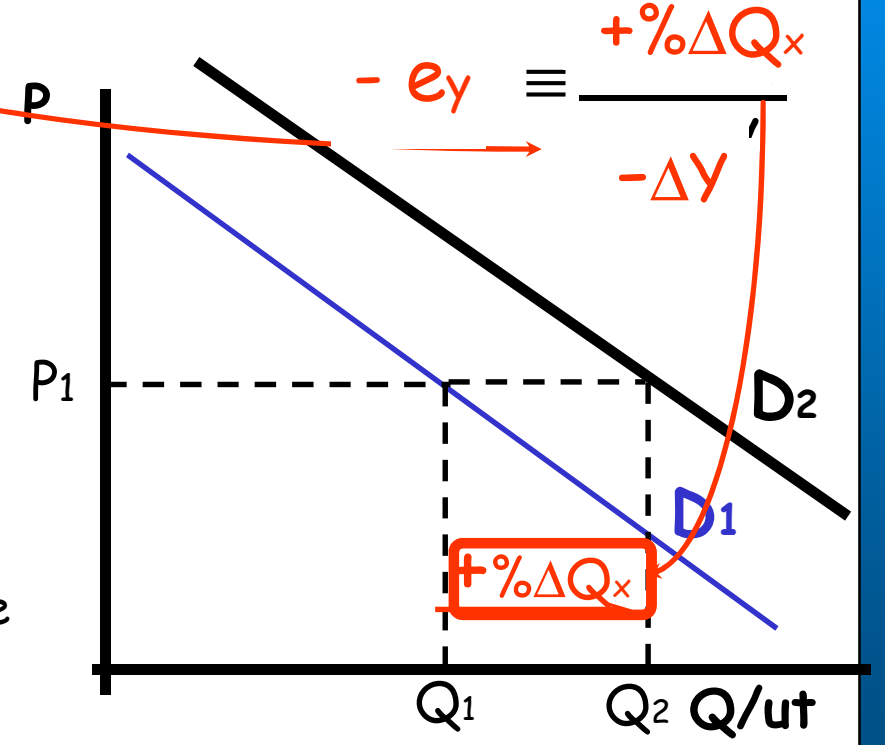
Income Elasticity
[inferior goods]

Decreases in income increase the demand for inferior goods.

A decrease in income [$-\Delta Y$] increases demand.

A decrease in income [$-\Delta Y$] results in an increase in demand, the income elasticity of demand is negative

For both increases and decreases in income the income elasticity is negative for inferior goods. The greater the absolute value of e_y, the more responsive buyers are to changes in income



Income Elasticity

- Income elasticity [e_y] is a measure of the effect of an income change on demand. [Can be calculated as point or arc.]
  - $e_y > 0$, [positive] is a normal or superior good an increase in income increases demand, a decrease in income decreases demand.
    - $0 < e_y < 1$ is a normal good
    - $1 < e_y$ is a superior good
  - $e_y < 0$, [negative] is an inferior good

Examples of e_y

- normal goods, [0 < e_y < 1], (between 0 and 1)
  - coffee, beef, Coca-Cola, food, Physicians' services, hamburgers, . . .
- Superior goods, [e_y > 1], (greater than 1)
  - movie tickets, foreign travel, wine, new cars, . . .
- Inferior goods, [e_y < 0], (negative)
  - flour, lard, beans, rolled oats, . . .

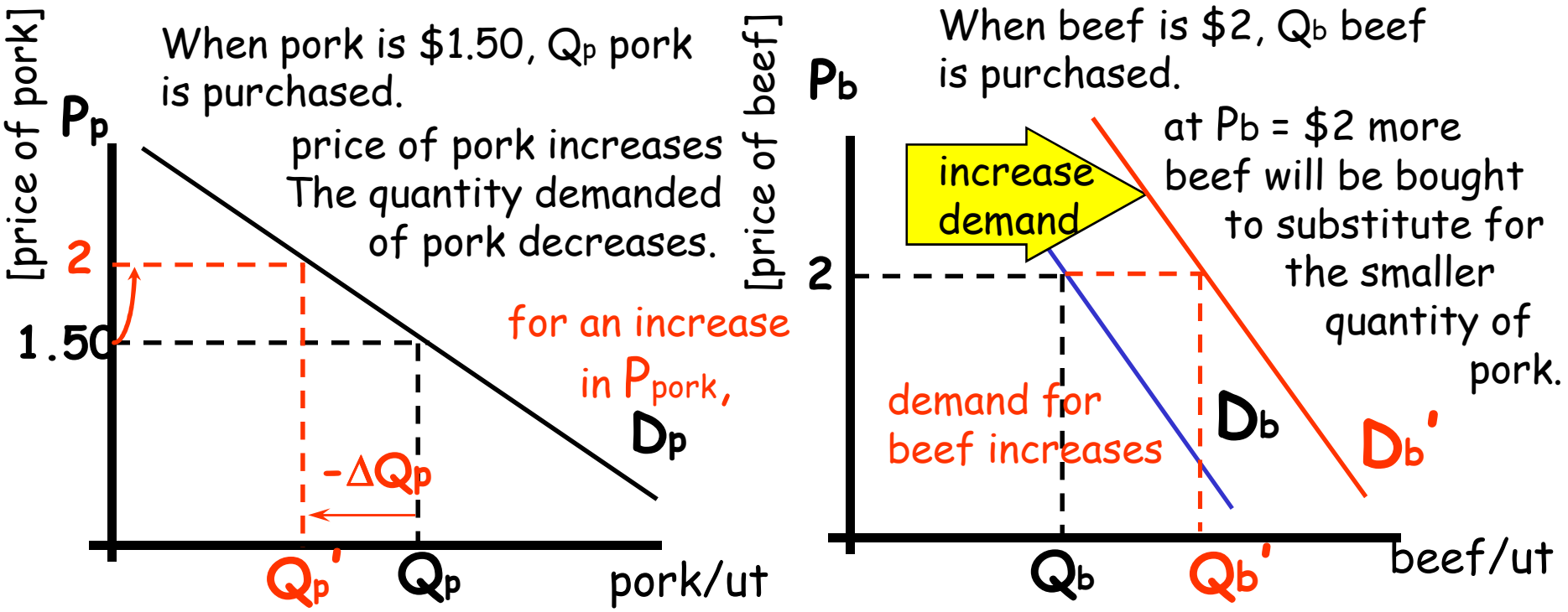
Cross-Price Elasticity

- Cross-price elasticity [e_{xy}] is a measure of how responsive the demand for a good is to changes in the prices of related goods.
- Given a change in the price of good Y [P_Y], what is the effect on the demand for good X [Q_Y]?
- e_{xy} is defined as:

$$e_{xy} \equiv \frac{\% \ \Delta \ Q_x}{\% \ \Delta \ P_y}$$

Cross-price elasticity of demand , [e_{xy}] [substitutes]

When the price of pork increases, it will tend to increase the demand for beef. People will substitute beef, which is relatively cheaper, for pork, which is relatively more expensive.



Cross-price elasticity

- In the case of beef and pork
  - the e_{bp} is not the same as e_{pb}
  - e_{bp} is the % change in the demand for beef with respect to a % change in the price of pork
  - e_{pb} is the % change in the demand for pork with respect to a % change in the price of beef
  - beef may not be a good substitute for pork
  - pork may not be a good substitute for beef

Cross-price elasticity of demand , [e_{xy}] [substitutes]

The cross elasticity of the demand for beef with respect to the price of pork, $e_{\text{beef-pork}}$ or e_{bp} can be calculated:

$$+e_{bp} = \frac{+\Delta Q_b}{+\Delta P_p}$$

positive

An increase in the price of pork, "causes" an increase in the demand for beef.

cross elasticity is positive

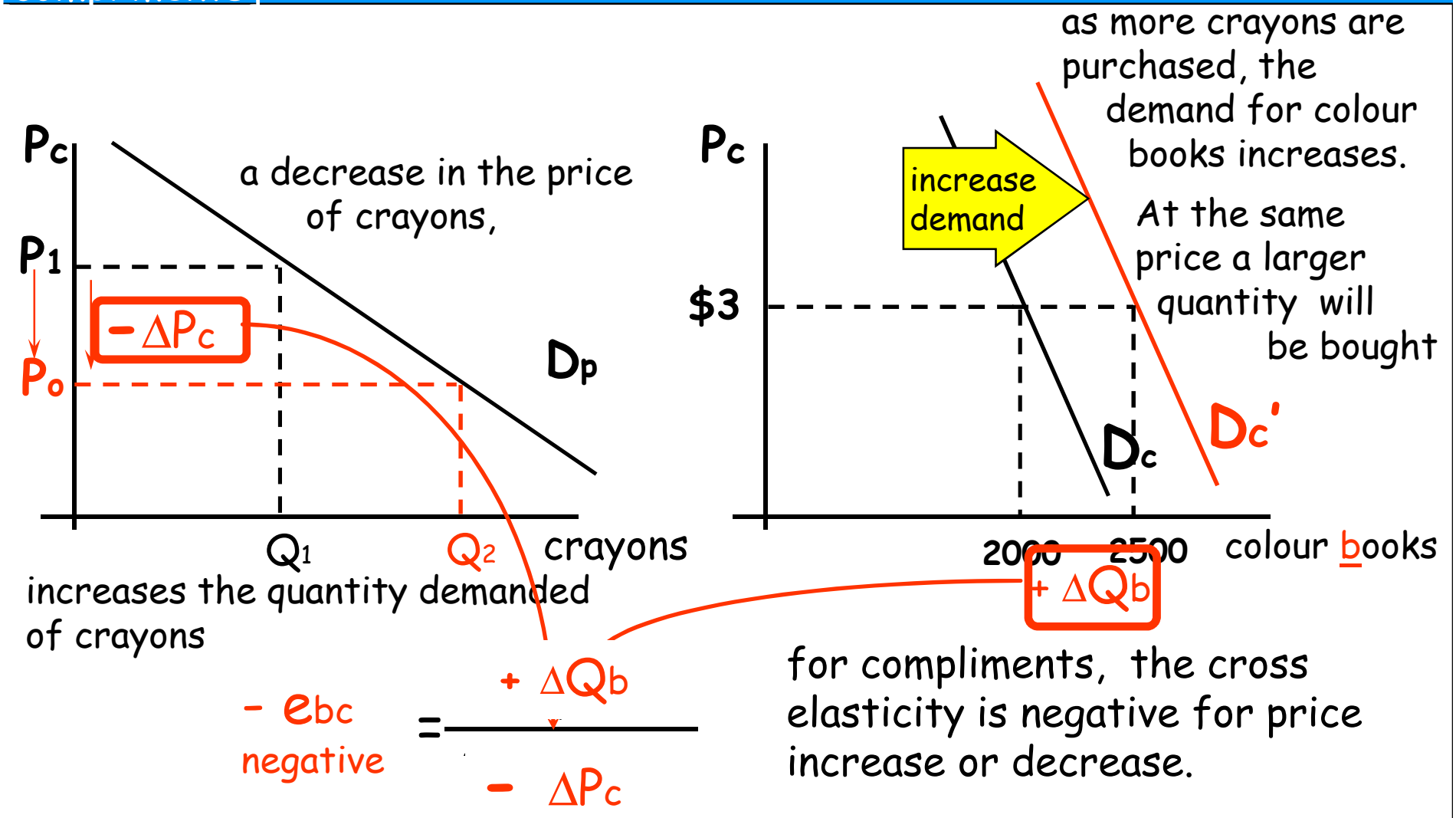
$$+e_{bp} = \frac{-\Delta Q_b}{-\Delta P_p}$$

positive

A decrease in the price of pork, "causes" a decrease in the demand for beef.

If goods are substitutes, e_{xy} will be positive. The greater the coefficient, the more likely they are good substitutes.

Cross-price elasticity of demand , [e_{xy}]
[compliments]



Cross-Price Elasticity

- $e_{xy} > 0$ [positive], suggests substitutes, the higher the coefficient the better the substitute
- $e_{xy} < 0$ [negative], suggests the goods are compliments, the greater the absolute value the more complimentary the goods are
- $e_{xy} = 0$, suggests the goods are not related
- e_{xy} can be used to define markets in legal proceedings

Elasticity of Supply

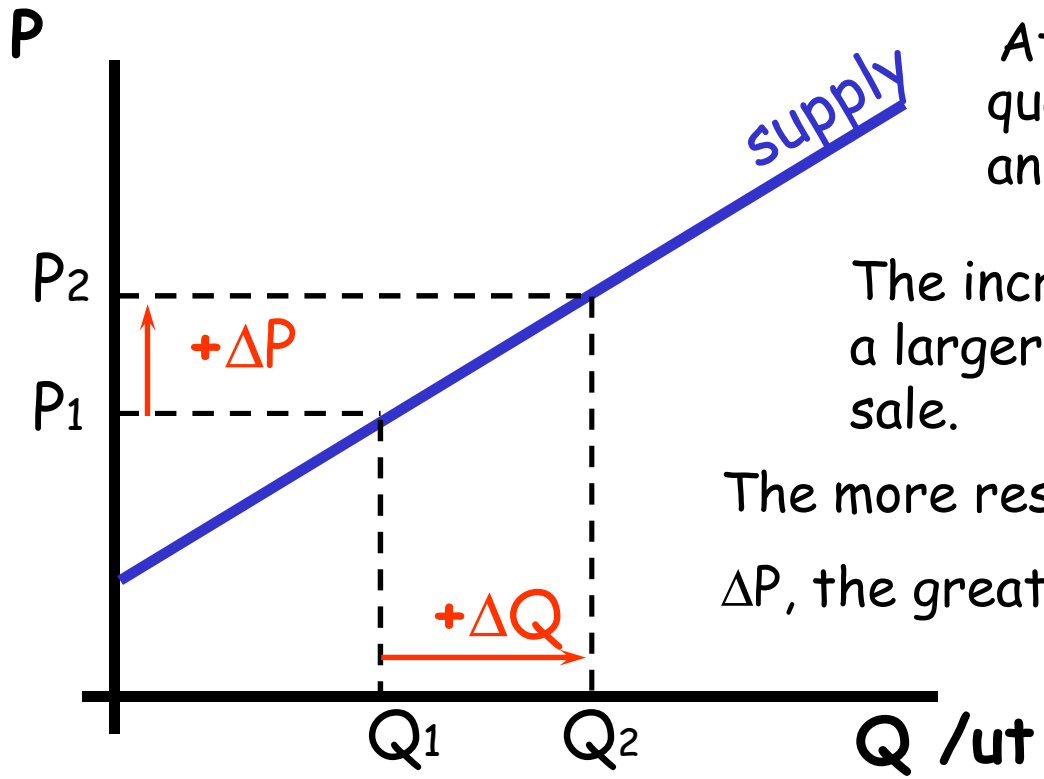
- Elasticity of supply is a measure of how responsive sellers are to changes in the price of the good.
- Elasticity of supply [e_p] is defined:

$$e_s = \frac{\%\ \Delta\ Quantity\ Supplied}{\%\ \Delta\ price}$$

Elasticity of supply

$$e_s = \frac{\%\Delta Q_{supplied}}{\%\Delta P}$$

Given a supply function, at a price [P_1], Q_1 is produced and offered for sale.



At a higher price [P_2], a larger quantity, Q_2, will be produced and offered for sale.

The increase in price [ΔP], induces a larger quantity goods [ΔQ]for sale.

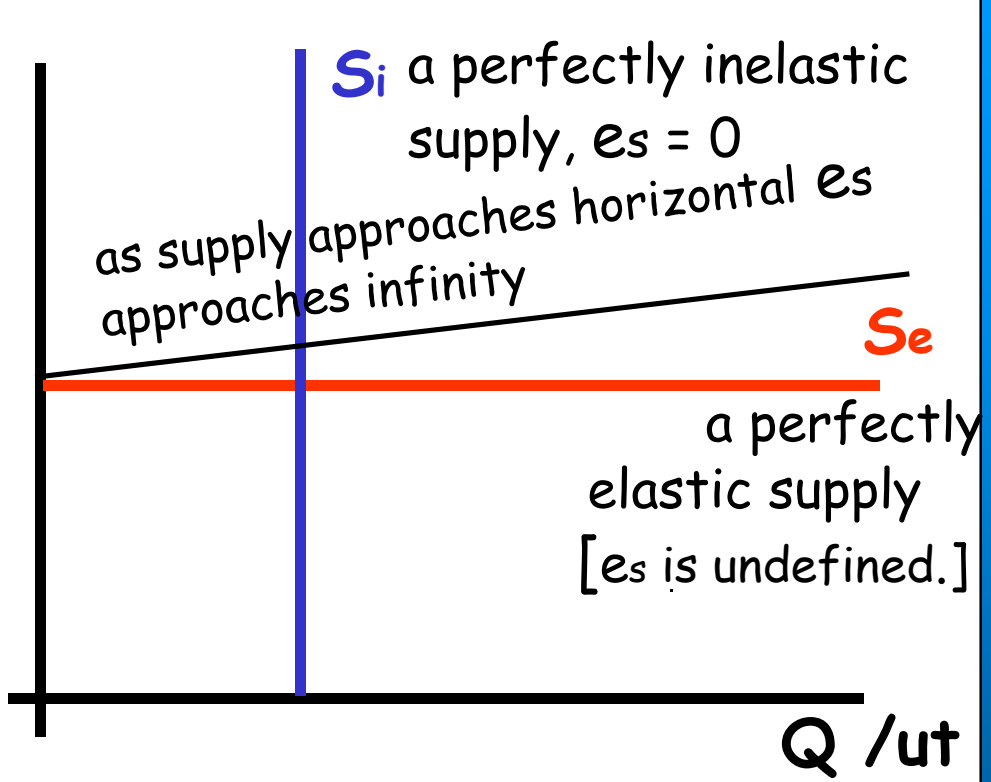
The more responsive sellers are to ΔP, the greater the absolute value of e_s.

[The supply function is "flatter"or more elastic]

The supply function is a model of sellers behavior.

Sellers behavior is influenced by:

1. technology
2. prices of inputs
3. time for adjustment
   - market period
   - short run
   - long run
   - very long run



4. expectations
5. anything that influences costs of production
   - taxes
   - regulations, . . .