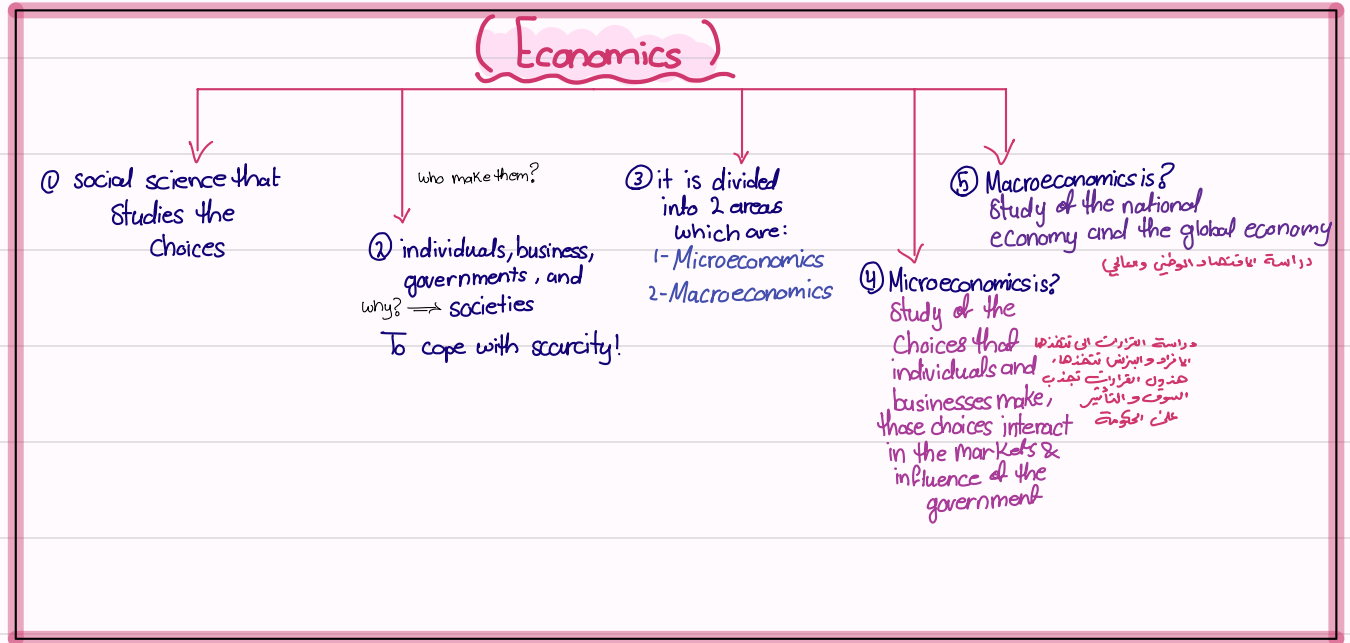


What is Economics?

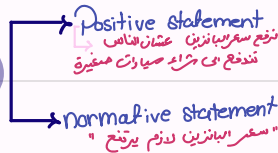
1- Economic is known for being the science of choice study of how people make decision

What is the importance of Economics?

Economic is the questions appear due to facing scarcity $\Rightarrow$ is what we want (endless wants) is more than what we have
Scarc (limited)



Economics



Trade offs $\Rightarrow$ giving one thing to get another
مثال $\Rightarrow$ اذا اشتريت ابل سوت تلفونات اكثر فتمتيع الادياد والادبوت يقل

Opportunity cost $\Rightarrow$ The high st-valued alternative that we give up to get something
مثال $\Rightarrow$ اما تشغل او تدرس او ماشوي شيء

Economic way of thinking

When we make a decision using economic way of thinking we should compare:

1- Marginal benefit

for example: 300 \$

2- Marginal cost

for example: 600 \$

Choosing at the margin or margin analysis

We should ignore sunk cost "past cost", ignore it because it is in the past cost, and we don't need it

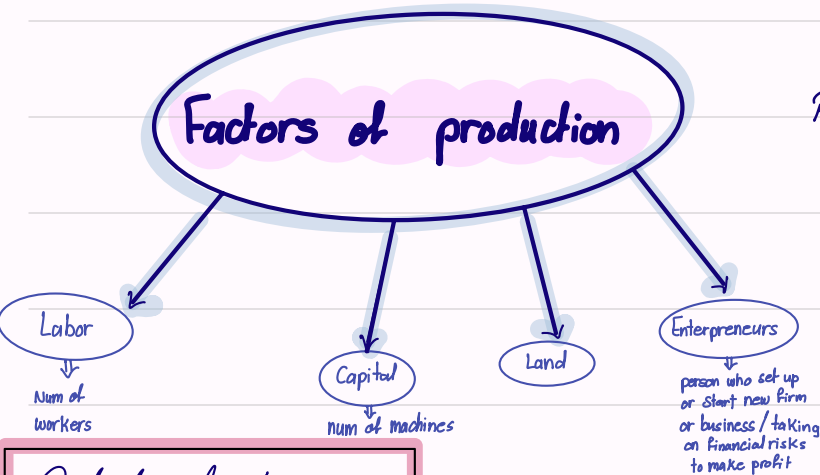
Example:-

A) Check the benefits first before repairing

Sunk cost is the \$1000

O#1- If you repair your car, you get \$6500, if you don't you will get paid \$5700

"The economic way of thinking"

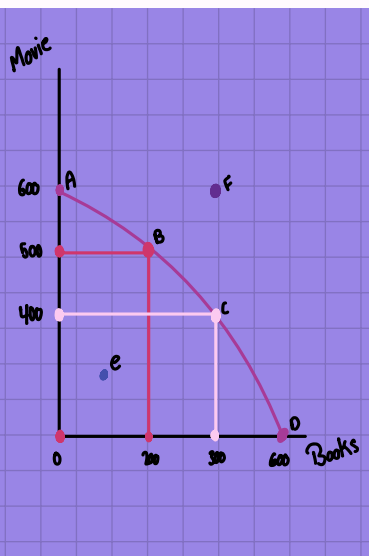


Production possibilities frontier
(PPF)

Production function:-

$$Y = f(L, K, \text{other factors})$$

out put
 function of
 Capital no. of machines
 Labor no. of workers



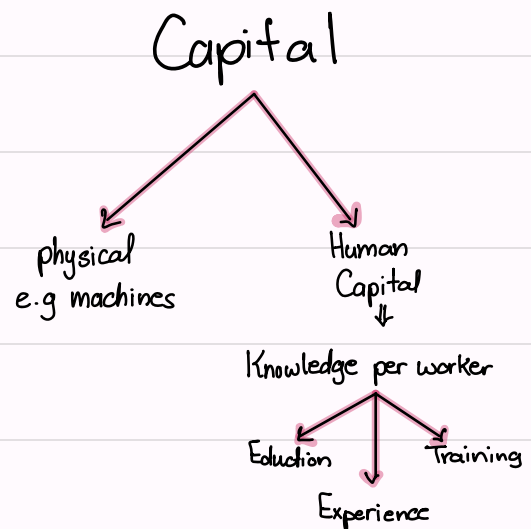
* A, B, C, D $\Rightarrow$ are the efficient points.

"Max production!"

* e $\Rightarrow$ is the inefficient point
"Inside the curve"

* A, B, C, D $\Rightarrow$ are attainable
"We can produce"

* F $\Rightarrow$ unattainable "We cannot produce at point F"



Economics is based on scarcity

What we want (endless wants) is more than what we have

source limited

resources

Labor

Num of workers

Capital

Num of machines

Natural resources

renewable

entrepreneurship

entrepreneurs

who set up a business and take the risk

Nonrenewable

- Solar, winds, trees, plant

- Land, Oil, Natural gas

2 types of scarcity

Absolute
e.g. Time

the time cannot be increased

Relative
e.g. Oil
Relative to demand

G & S

Goods

tangible
cell phone, laptop

service

intangible
insurance, legal

Factors of production
⇒ scarcity creates Trade offs

A Trade off is what you have to give up one thing to get another!
Example: producing more phones, less production in laptops, tablets

So, we have maximum to produce
This can only be shown by:

Production Possibilities Frontier (PPF)

beyond ppf is unattainable

Good 1: Benches
Good 2: Chairs

on ppf curve
efficient

inside ppf curve
inefficient

attainable

	Good 1		Good 2	
	Time spent (hours)	Product made	Time spent (hours)	Product made
A	0	0	4	20
B	1	4	3	18
C	2	7	2	14
D	3	9	1	8
E	4	10	0	0

The opp cost of producing 4 units of good 1 is to give up 2 units of good 2 (20 - 18)

The opp cost of producing 3 units of good 1 is to give up 4 units of good 2 (18 - 14)

Example:-

What is the opportunity cost of producing one unit of good 1 if the third hour is added?

Marginal Benefit

- MB (gain): $9 - 7 = 2$ units

Marginal cost

- MC (loss): $14 - 6 = 6$ units

Trade-off interpretation:

Adding 2 units of good 1
opp cost of 6 units of good 2
1 unit

Opp Cost of producing 1 unit of good 1 if the third hour is added is? $= \frac{6 \text{ (loss)}}{2 \text{ (gain)}} = 3$ units of good 2

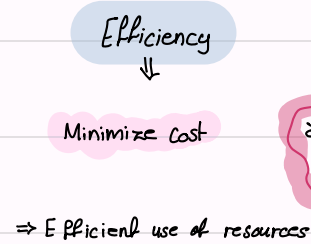
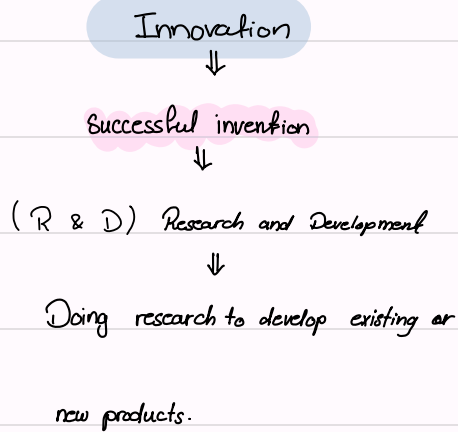
What is the dollar value of opp cost if the price of good 2 = \$12 per unit
 $\$12 \times 3 = \36

Opportunity cost: The highest valued alternative that we give up to get something

The law of increasing the opp. cost as more of good is produced

Then opp. cost rises ↑

(Economics Vs. Islamic Economics)



تحتوي أكبر خايدة
بأقل تكلفة وأقل
استغلال للمواد

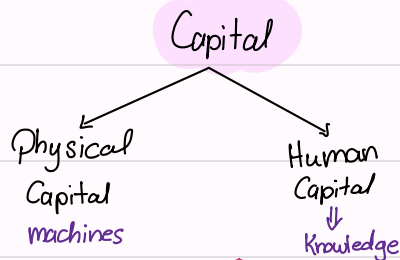
(Economic problems e.g. poverty)

⇒ Economics : is due to Scarcity

Islamic Economics : Economic problems are due to unequal distribution of resources and income.

⇒ inefficient use of resources

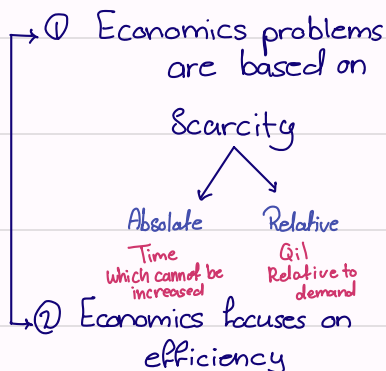
⇒ Scarcity is relative



Quiz #1
March 5

Economics

Islamic Economics



Economic problems are based on unequal distribution of income and resources

it focuses on
efficiency
equality
fairness

Demand and Supply

↓
Consumer Side ↓
Producer Side

Demand = Supply
↓
Equilibrium

Shift to left

Shift to right

increase

decrease

1 Demand

What are the factors affect Demand?

Price factor

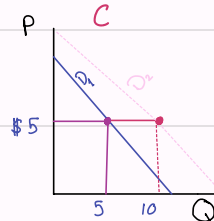
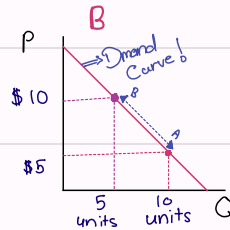
Law of demand
the relation is $\ominus$
Price ↑ main good → Quantity ↓
Price ↓ main good → Quantity ↑

Non-price factors

income price of related goods
Normal Good ↓ Inferior Good ↓
↑ income → ↑ D ↑ income → ↓ D
Graph B Graph C

relation $\oplus$ ⇒ $\uparrow \downarrow \uparrow \downarrow$
relation $\ominus$ ⇒ $\uparrow \downarrow \uparrow \downarrow$

↑ income ⇒ Inferior goods
↓ Demand



Price of related goods

Substitute
Price ↑ Sub ↑ D main good

Figure A

if the price of coffee is more people will demand tea than coffee

Complement

Price ↑ Comp ↓ D main good

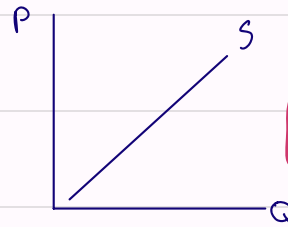
Figure B

it is like asking for something extra that make the order better

Supply side

Law of supply:

Price ↑ main good Quantity ↑ S



Total Revenue TR

$$TR = P \times Q$$

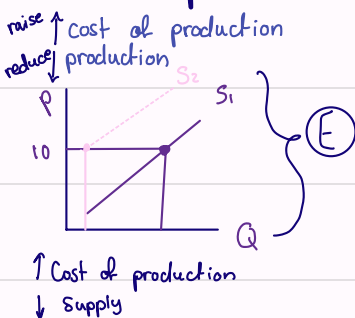
$$P = \frac{TR}{Q}$$

Revenue per unit!

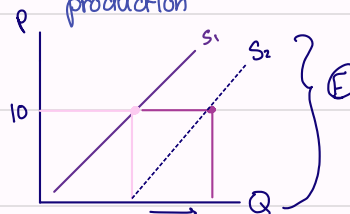
electricity!
if TR ↓ ⇒ P ↓ × Q ↓ ⇒ will decrease
more supply will increase

* What are non price factors effect the supply curve?

① Cost of production
↑ wage or ↑ inputs
eg. Caudé oil

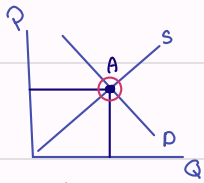


② Technology
methods of production

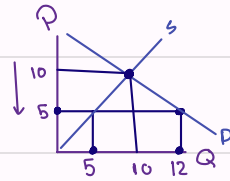


$$D = S$$

↓
Equilibrium

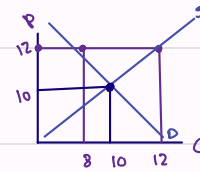


point(A) $\Rightarrow$ Equilibrium $\Rightarrow D = S$
point



When $p = 5$, $Q_d = 12$, $Q_s = 5$

$Q_d > Q_s$
Shortage
in
Supply



When $p = 12$, $Q_s = 12$, $Q_d = 8$

$Q_s > Q_d$
Surplus

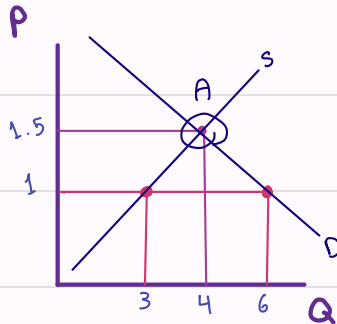
Invisible Hand

By D & S and competition Both consumers & producers will max their benefits surpluses

without government intervention

	Price (dollars per disc)	Quantity demanded (millions of discs per week)
A	0.50	9
B	1.00	6
C	1.50	4
D	2.00	3
E	2.50	2

	Price (dollars per disc)	Quantity supplied (millions of discs per week)
A	0.50	0
B	1.00	3
C	1.50	4
D	2.00	5
E	2.50	6



point (A) Equilibrium point

Shortage
 $S < D$

Example of shortage: point B $\Rightarrow$ price = 1

$$Q_s = 3 < Q_d = 6$$

Accounting cost

* Explicit cost
+
* Implicit cost

Economic cost

Items	Amount
Explicit (Accounting) costs → → → → Implicit costs	
Economic cost (Accounting + Implicit)	

Explicit $\Rightarrow$ is the Accounting cost

Implicit $\Rightarrow$ is (+) with Accounting to provide Economic cost

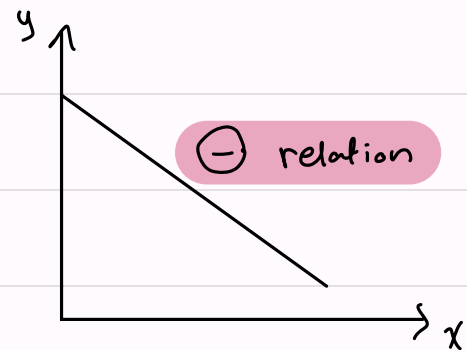
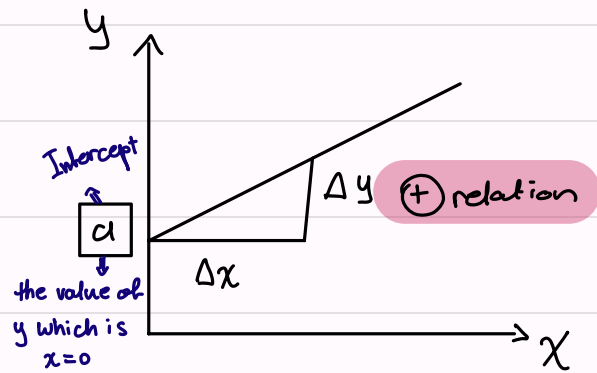
(Law of demand)

$\uparrow P$ $\downarrow Q_d$

Negative slope

$$Q_d = a - bP \Rightarrow \text{demand function}$$

Change in Δy
Slope $b = \frac{\Delta y}{\Delta x}$ $\Rightarrow$ if x changes by 1 unit by how much y will change



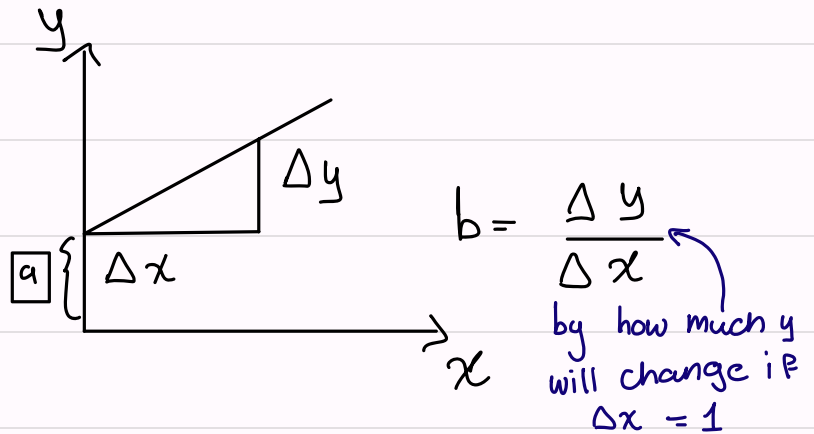
(Law of supply)

When price increases Quantity increases

↑ P ↑ Q_s

⊕ positive slope

$$Q_s = a + bP$$



Example 8-

Intercept ↓
 $Q_d = 10 - 2P$
 Slope is ⊖ based on the law of demand
 ↑ P ↓ Q_d

$$Q_s = 2 + 2P$$

Calculate :-
 Slope is ⊕ based on the law of supply
 ↑ P Q_s ↑

$$Q_d = Q_s$$

$$10 - 2P = 2 + 2P$$

$$10 - 2 = 2P + 2P$$

$$8 = 4P$$

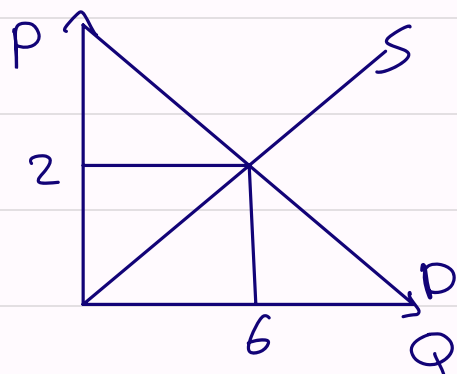
$$P = \frac{8}{4} \Rightarrow P = 2$$

$$Q_d \Rightarrow 10 - 2(2) = 10 - 4 \Rightarrow 6$$

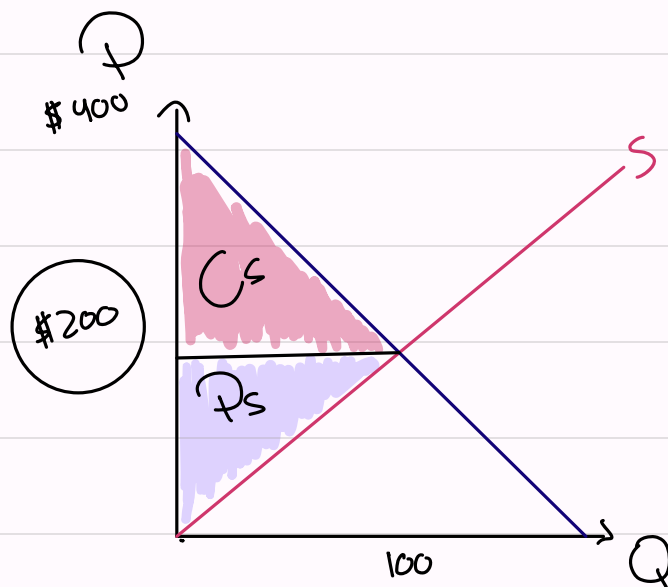
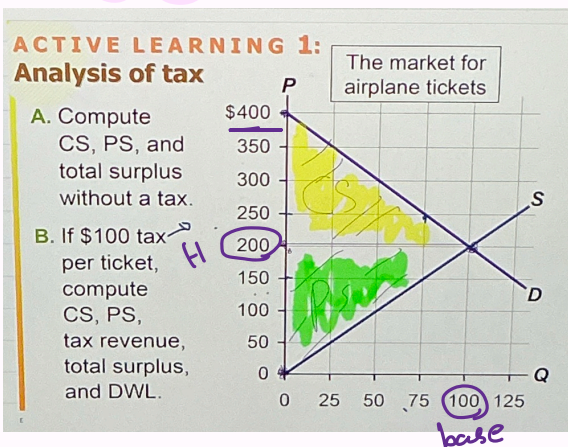
$$Q_s \Rightarrow 2 + 2(2) = 2 + 4 = 6$$

$$Q_d = Q_s$$

At Equilibrium $\Rightarrow Q_d = Q_s$



Analysis of tax



Consumer surplus (benefit)

$$\begin{aligned}
 CS &= \frac{1}{2} \text{ base} \times \text{height} \\
 &= \frac{1}{2} (100 - 0) \times (400 - 200) \\
 &= \frac{1}{2} 100 \times 200 \\
 &= \$10,000
 \end{aligned}$$

Producer Surplus (benefit)

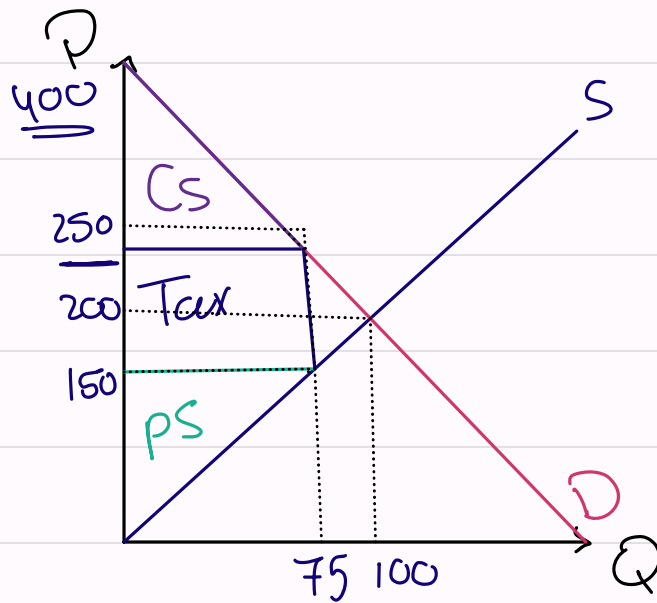
$$\begin{aligned}
 PS &= \frac{1}{2} \text{ base} \times \text{Height} \\
 &= \frac{1}{2} (100 - 0) \times 200 - 0 \\
 &= \frac{1}{2} 100 \times 200 \\
 &= \$10,000
 \end{aligned}$$

Total Surplus (TS)

$$TS = PS + CS$$

$$TS = 10,000 + 10,000$$

$$TS = \$20,000 \Rightarrow \text{before the government Intervention "Taxes"}$$



$$TS = CS + PS + TAX \rightarrow \text{Government Revenue}$$

$$\textcircled{1} CS = \frac{1}{2} \times H \times B$$

$$= \frac{1}{2} \times (400 - 250) \times 75$$

$$= \frac{1}{2} \times 150 \times 75$$

$$= \$5,625$$

$$\textcircled{2} PS = \frac{1}{2} \times H \times B$$

$$= \frac{1}{2} \times (150 - 0) \times (75 - 0)$$

$$= \frac{1}{2} \times 150 \times 75$$

$$= \$5,625$$

$$\textcircled{3} TAX = H \times B$$

$$(250 - 150) \times 75$$

$$= \$7,500$$

$$\textcircled{4} TS = CS + PS + TAX$$

$$= 5625 + 5625 + 7500$$

$$= \$18,750$$

\$20,000 $\Rightarrow$ Before tax

\$18,750 $\Rightarrow$ After tax

$$\text{Dead weight loss} = \frac{20000}{18750} -$$

DWL

\$1,250

due to government
intervention tax

Example :-

A scenario...

You design websites for local businesses.
You charge \$200 per website, and currently sell 12 websites per month.
 $TR = P * Q = 200 * 12 = \2400

Your costs are rising (including the opp. cost of your time), so you're thinking of raising the price to \$250.
 $P \uparrow \$200 \rightarrow \250
 $TR \uparrow \downarrow ?$

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?

This mean $\Delta \Rightarrow$ change

Elasticity $\Rightarrow \% \Delta Qd$ if $\% \Delta P$

what is the percentage change in Qd if the price change?

(VERY IMPORTANT)

Always use the midpoint than the standard to get better results and answers!

To answer this question we need to calculate!

Price Elasticity of demand
"E"

$$E = \frac{\% \Delta Qd}{\% \Delta P}$$

if $\% \Delta Qd > \% \Delta P \Rightarrow \downarrow TR$ decrease!

$E < 1$ if $\% \Delta Qd < \% \Delta P \Rightarrow \uparrow TR$

$E = 1$ $\% \Delta Qd = \% \Delta P \Rightarrow$ No change in TR

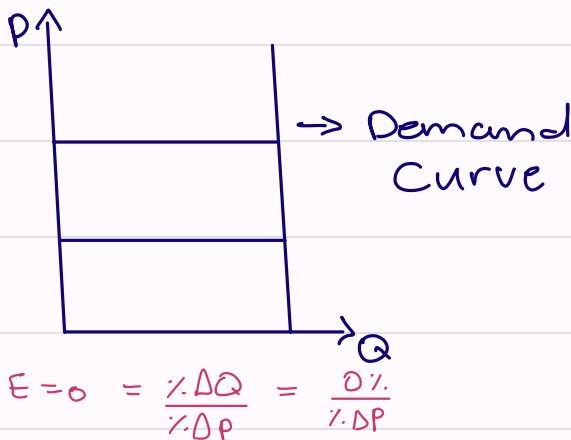
$E > 1$ (elastic demand) $\rightarrow \downarrow TR$

$E < 1$ (inelastic demand) $\rightarrow \uparrow TR$

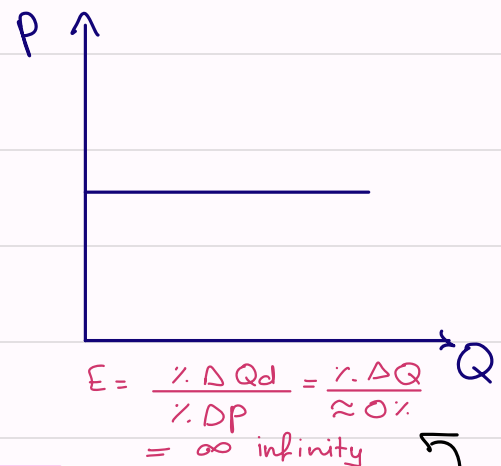
$E = 1$ (unit elastic) $\rightarrow$ No change in TR

2 Extreme cases

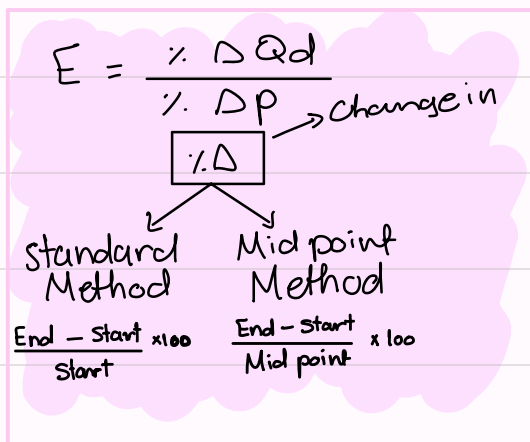
* perfectly inelastic demand



* perfectly elastic demand



(if price increases change in demand)



Standard Method

Start → End

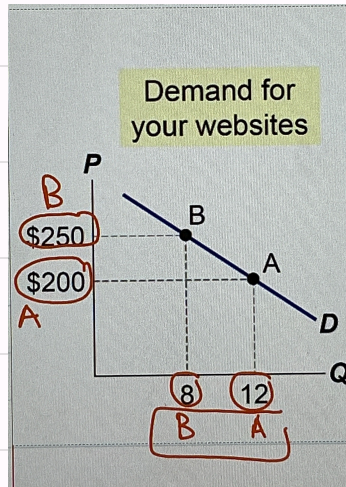
A → B

$$\% \Delta Q_d = \frac{\text{End} - \text{Start}}{\text{Start}} \times 100$$

$$= \frac{8 - 12}{12} \times 100 = \frac{4}{12} \times 100$$

$$33.33\%$$

We ignore $\ominus$ sign



Start → End
B → A

$$\% \Delta Q_d = \frac{\text{Start} - \text{End}}{\text{End}} \times 100$$

$$= \frac{8 - 12}{8} \times 100$$

$$= \frac{4}{8} \times 100$$

$$= 50\%$$

$$\% \Delta P = \frac{\text{End} - \text{Start}}{\text{Start}} \times 100$$

$$\% \Delta P = \frac{250 - 200}{200} \times 100$$

$$= \frac{50}{200} \times 100$$

$$\frac{1}{4} \times 100$$

$$= 25\%$$

$$E = \frac{\% \Delta Q_d}{\% \Delta P}$$

$$E = \frac{33.33\%}{25\%} = 1.3 \Rightarrow E = 1.3 > 1$$

$$\% \Delta P = \frac{\text{Start} - \text{End}}{\text{End}} \times 100$$

$$\% \Delta P = \frac{200 - 250}{250} \times 100$$

$$= 20\%$$

$$E = \frac{\% \Delta Q_d}{\% \Delta P}$$

$$E = \frac{50\%}{20\%}$$

$$E = 2.5 \Rightarrow 2.5 > 1$$

Elastic demand

↑ P ↓ TR

Problem

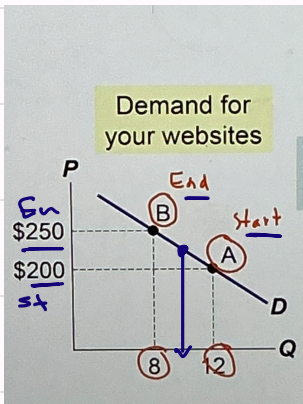
The result of E depends on start value

if the start value is A $\Rightarrow E = 1.33$

if the start value is B $\Rightarrow E = 2.5$

To overcome this problem we should use Mid point

(Mid point Method)



$8 + 2 = 10$
 $12 - 2 = 10$ → may be the mid point

$$\% \Delta Q_d = \frac{\text{End} - \text{start}}{\text{Mid point}} \times 100$$

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

$$= 40\%$$

$$\% \Delta p = \frac{\text{End} - \text{start}}{\text{Mid point}} \times 100$$

$$= \frac{250 - 200}{\frac{250 + 200}{2}} \times 100$$

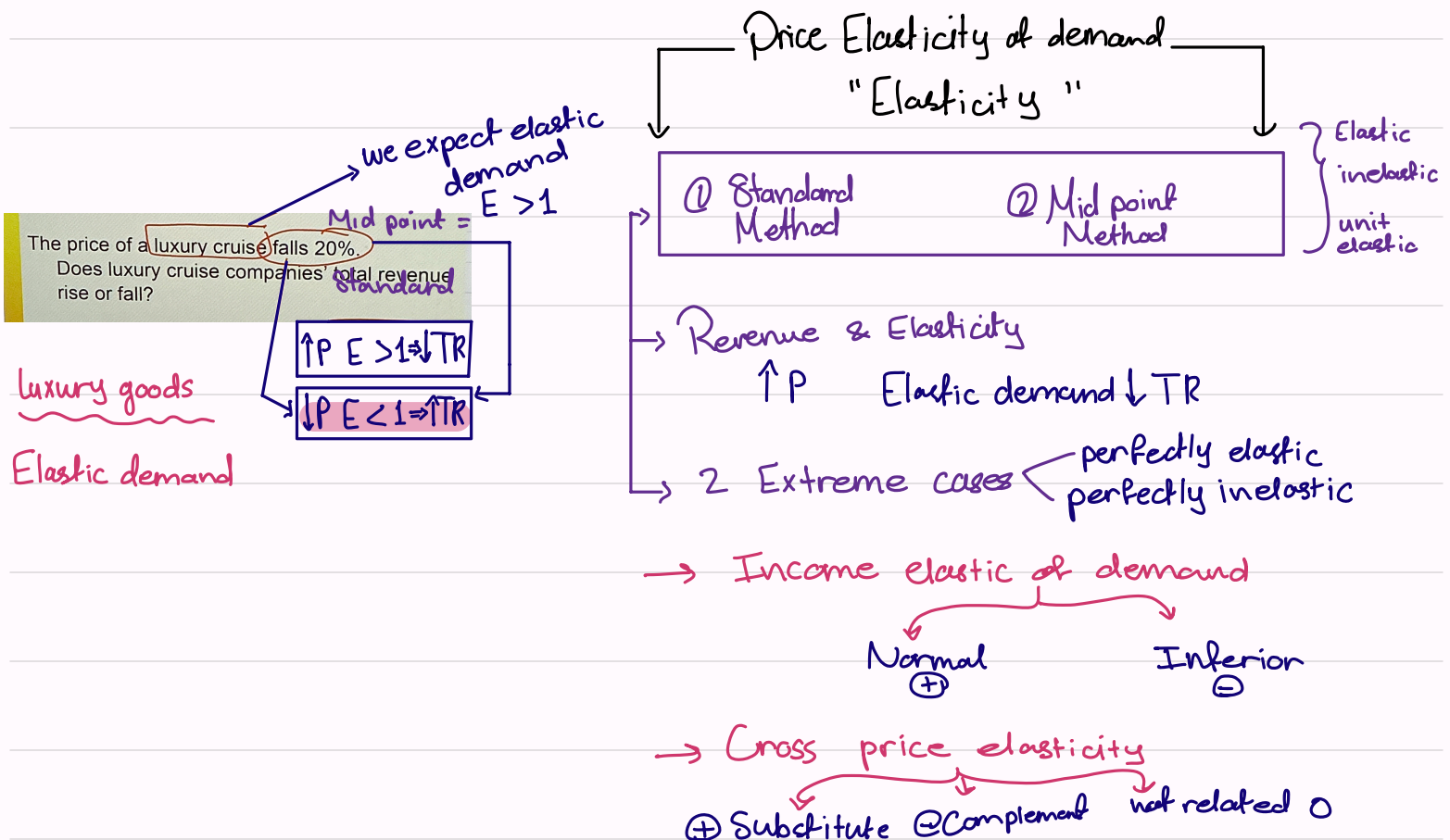
$$= \frac{50}{225} \times 100$$

$$= 22.22\% \Rightarrow 1.8$$

$E = 1.8 > 1 \Rightarrow$ Elastic demand $\Rightarrow \uparrow P \downarrow TR$

Mid point method is more powerful and better than standard method

The Mid point method gives you same result regard less of the start value



"Summary"

Question 1:

If Starbucks's marketing department estimates the income elasticity of demand for its coffee to be 2.6, how will the prospect of an economic boom (expected to increase consumers' incomes by 6 percent over the next year) impact the quantity of coffee Starbucks expects to sell? Explain your answer.

$E_{\text{for demand}} = 2.6 \leftarrow \text{income of demand}$
Income $\Rightarrow 6\%$
 $Q_d \Rightarrow ?$

Answer 8-

$$\text{Income of demand} = \frac{\% \Delta Q_d}{\% \Delta \text{Income}}$$

$$\Rightarrow 2.6 = \frac{\% \Delta Q_d}{6\%}$$

$$\Rightarrow \% \Delta Q_d = 2.6 \times 6\%$$

$$\% \Delta Q_d = 15.6\%$$

To check ! :-

$$\Rightarrow \frac{\% \Delta Q_d}{\% \Delta \text{Income}}$$

$$\Rightarrow \frac{15.6\%}{6\%}$$

$$\text{Income of demand} = 2.6 \checkmark$$

ACTIVE LEARNING 1: Calculate an elasticity

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

if $P = \$70$, $Q^d = 5000$ Start
if $P = \$90$, $Q^d = 3000$ End

Answer 8-

$$E = \frac{\% \Delta Q_d}{\% \Delta P}$$

$$\textcircled{1} \% \Delta Q_d = \frac{5000 - 3000}{4000} \times 100$$

$$\text{Mid point} \leftarrow \frac{5000 + 3000}{2} = 4000$$

$$\% \Delta Q_d = 50\%$$

$$\textcircled{2} \% \Delta P = \frac{90 - 70}{80} \times 100$$

$$\% \Delta P = 25\%$$

$$\text{Mid point} \frac{90 + 70}{2} = 80$$

$$\textcircled{3} E = \frac{\% \Delta Q_d}{\% P}$$

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

$$E = 2 \Rightarrow$$

* $E > 1 \Rightarrow$ Elastic demand

so $\uparrow P \downarrow TR$

Other Elasticities

Price (E) of demand

Income elasticity of demand

Cross price elasticity

$$= \frac{\% \Delta Q_d}{\% \Delta P}$$

* Income elasticity of demand

$$= \frac{\% \Delta Q_d}{\% \Delta \text{Income}} \times 100$$

Normal good
 $\oplus$

Inferior good
 $\ominus$

x y
 $\uparrow$ $\uparrow$ } $\oplus$
 $\downarrow$ $\downarrow$ } $\oplus$

* Cross - price elasticity

$\uparrow P_{sub}$

↑ Qd main good ↑

X	Y	
↑	↓	{ ⊖ }

$\uparrow$ $P_{\text{complement}}$

↓ Qd main good $\ominus$

↓ ↑) ⊖

Cross - price elasticity

$$= \frac{\% \Delta Q_d \text{ main good}}{\% \Delta p_y}$$

Sub
⊕

Complement
⊕

No
relation
0

Some Examples:-

Tea $\Rightarrow$ Main good

Coffee $\Rightarrow$ Sub

Sugar $\Rightarrow$ Complement

The cross-price elasticity value is listed in the table below.

"Based on the above table A and B are substitutes" Is the previous statement correct? Explain.

Cross-price elasticity = $\frac{\% \Delta Q_d x}{\% \Delta P_y}$
 $\Downarrow$
 $\ominus \Rightarrow$ complement

Elasticities

Price E of demand
"Elasticity"

↓

Calculate E using

- Standard Method
- Midpoint Method

→ E & TR

$\uparrow P \quad E > 1 \quad \downarrow TR$

Elastic demand

Income elasticity of demand

- Normal $\oplus$
- Inferior $\ominus$

Cross-price elasticity

- Sub $\oplus$
- Comp $\ominus$
- no relation 0

Some laws in one note ↓

Demand = $a - bp$	(-) slope
Supply = $a + bp$	(+) slope
CS = $\frac{1}{2} \times H \times P$	

Demand = $a - bp$ (-) slope
 Supply = $a + bp$ (+) slope
 $CS = \frac{1}{2} \times H \times B$ Drop 1
 $P+S \Rightarrow \frac{1}{2}$ (TR-TC)
 Total surplus $\Rightarrow ps + cs$
 TAX = $H \times B$
 Dead weight loss $\Rightarrow \frac{\text{old tax}}{\text{new tax}}$
 $E = \frac{\% \Delta Q_d}{\% \Delta P}$
 Mid point - $\frac{\text{end - start}}{\text{mid point}} \times 100$
 $* MR = \frac{\Delta TR}{\Delta Q}$
 $* MC = \frac{\Delta TC}{\Delta Q}$
 Standard point = $\frac{\text{end - start}}{\text{start}} \times 100$
 $E = \frac{\% \Delta}{\% \Delta}$ @ $\frac{\frac{\text{end - start}}{\text{mid point}} \times 100}{\frac{\text{end - start}}{\text{mid point}} \times 100}$
 Income of demand: $\frac{\% \Delta Q_d}{\% \text{Income}}$
 Cross-price elasticity = $\frac{\% \Delta \text{sub. main good}}{\% \Delta \text{main good}}$
 $P_y \rightarrow$ Sub Comp
 $\rightarrow$ Comp Sub

What is Q that can max profit

Q	P	Total cost	Total Revenue	profit (TR-TC)	Marginal Revenue	Marginal Cost
0 x	10	0	0	-5 loss	10	4
1 x	10	5	10	1	10	6
2 x	10	9	20	5	10	8
3 x	10	15	30	7	10 = 10	
4 x	10	23	40	7		
5 x	10	33	50	7	10	12
		45		5		

$$MR = \frac{\Delta TR}{\Delta Q}$$

$$MC = \frac{\Delta TC}{\Delta Q}$$

Q that can Max profit is

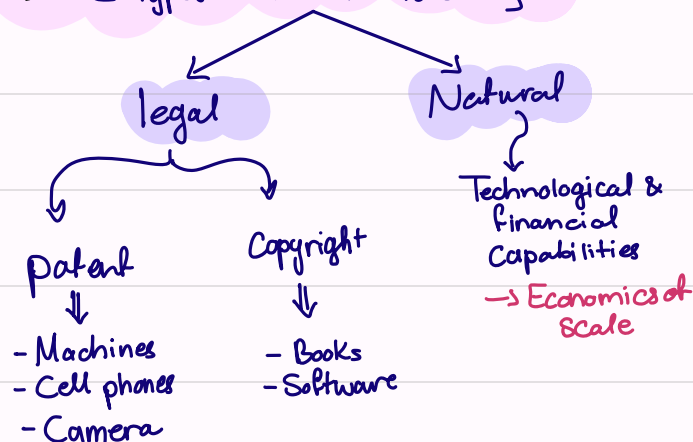
when MR = MC

Q=4 $\Rightarrow$ MR = MC

Market Structure

Characteristics	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Number of firms in industry	Many	Many	Few	One
Product	Identical	Differentiated	Either identical or differentiated	No close substitutes
Barriers to entry	None	None	Moderate	High
Firm's control over price	None	Some	Considerable	Considerable or regulated
Concentration ratio	0	Low	High	100
HHI (approx. ranges)	Less than 100	101 to 999	More than 1,000	10,000
Examples	Wheat, corn	Food, clothing	Automobiles, cereals	Local water supply

* Barriers to entry => 2 Types of barriers to entry



* Firm's Control over price

Market power => The ability to raise the price!

* (regulated) by government

preventing Monopolistic behavior

Firms have no Ability (power) to change the price $\Rightarrow$ price is constant

Max rule profit

$$MR = MC$$

$$\begin{array}{c} \downarrow \\ P \times Q \leftarrow \frac{\Delta TR}{\Delta Q} \end{array} \quad \begin{array}{c} \downarrow \\ \frac{\Delta TC}{\Delta Q} \end{array}$$

Q	P	Tc	TR	MR	MC	Profit
0	7.5	5	0			
1	7.5	20	7.5	7.5	15	-12.5
2	7.5	26	15	7.5	6	-11
3	7.5	35	22.5	7.5	9	-12.5
4	7.5	46	30	7.5	11	-16
5	7.5	59	37.5	7.5	13	-21.5

AT 2 The MC = (6+9)/2 = 7.5 = P

Lucy's Lasagna is a price taker that has the following costs:

Output (plates per hour)	Total cost (dollars per hour)
0	5
1	20
2	26
3	35
4	46
5	59

If lasagna sells for \$7.50 a plate, what is Lucy's profit-maximizing

When profit is $\ominus \Rightarrow$ means loss

Lucy's Lasagna is a price taker that has the following costs:

Output (plates per hour)	Total cost (dollars per hour)	TR $P \times Q$	MR	MC
0	5	0		
1	20	7.5	7.5	15
2	26	15	7.5	6
3	35	22.5	7.5	9
4	46	30	7.5	11
5	59	37.5	7.5	13

If lasagna sells for \$7.50 a plate, what is Lucy's profit-maximizing

$\frac{\Delta TR}{\Delta Q}$

$\frac{15}{1} = 15$

Q that can be max profit

$$MR = MC$$

The profit $\Rightarrow$ AT 2 $MC = \frac{6+9}{2} = 7.5$
 is $MR = \frac{7.5+7.5}{2} = 7.5$

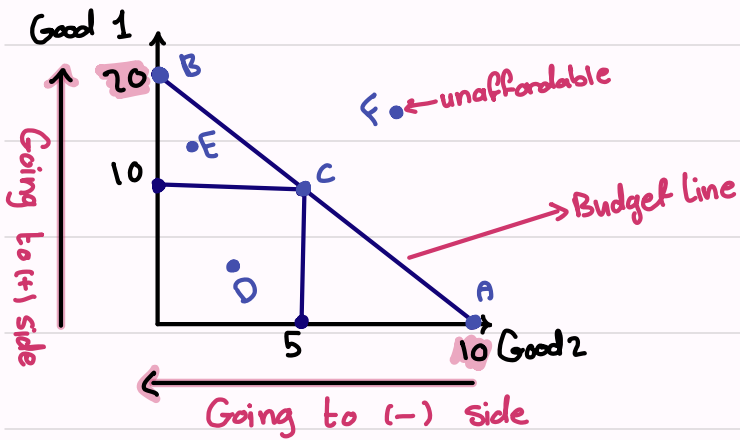
Maximized AT 3 $MC = \frac{9+14}{2} = 10 \neq 7.5$

AT 4 $MC = \frac{11+13}{2} = 12 \neq 7.5$

AT 5 $MC \neq MR$

Budget Line

$$P_1 \cdot Q_1 + P_2 \cdot Q_2 = \text{Income!}$$



Point (A, B, C) → Max Consumption

Point (D, E) → affordable but not max consumption!

Affordable points

Point (F) → unaffordable !!!

Calculate Slope $A \rightarrow B = \frac{\Delta \text{Good 1}}{\Delta \text{Good 2}} = \frac{(+1)20}{(-1)10} = -2$

Slope $\frac{\Delta y}{\Delta x}$

↑ Good 2 = 1 unit

↓ Good 1 = -2

If you increase your demand of good 2 by 1 unit, you have to give up 2 units of good 1

Utility

Measure Consumers satisfaction

Example 8-

^{Q consumer} Trips to London	^{Total utility} Total Satisfaction	^{Marginal Utility} ^{⇒ To get this} $\frac{\Delta \text{Total Utility}}{\Delta Q \text{ consumer}}$ Satisfaction
1	10	10
2	18	8
3	23	5
4	26	3
5	27	1
6	27	0

⇒ To explain: the more you visit London the less satisfied you will be!

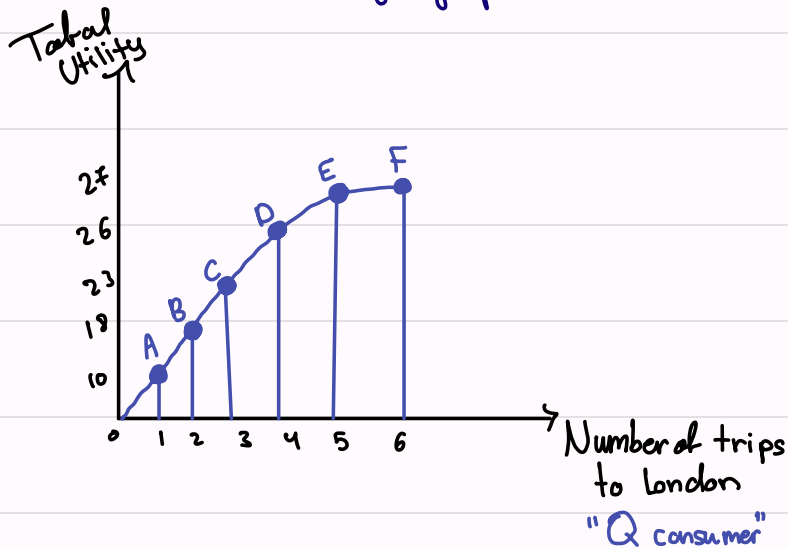
law of diminishing Marginal Utility

↑ $Q \text{ consumer}$
↓ MU

Marginal Utility:-

$$\begin{aligned}
 &\Rightarrow \frac{\Delta \text{Total Utility}}{\Delta Q \text{ consumer}} \\
 &= \frac{8}{1} \Rightarrow 8
 \end{aligned}$$

Draw the total utility graph



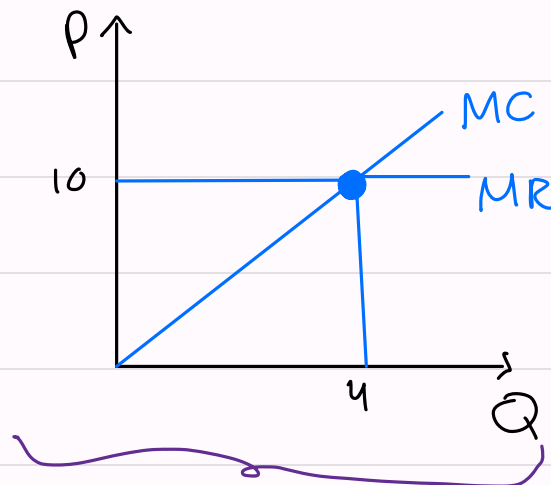
What Q that can max firms profit $\rightarrow (TR - TC)$ ^{law}

Example :-

$P=10$ stays the same

Q	P	TC	TR	profit $TR - TC$	MC $\frac{\Delta TC}{\Delta Q}$	MR $\frac{\Delta TR}{\Delta Q}$
0	10	5	0	-5	-	10
1	10	9	10	1	4	10
2	10	15	20	5	6	10
3	10	23	30	7	8	10
4	10	33	40	7	10	10
5	10	45	50	5	12	1

$$MR = MC$$



The market perfect competition

$$Q=4 \Rightarrow P = MC = MR$$

$$10 = 10 = 10 \checkmark$$

we can find the Q that can max profit

Total Cost

Fixed Cost

it does not change with output

Examples:-

- Rent

الفائدة (البوناسة تأخذ على القرض فائدة)
مثال: 5% من المبلغ المقرض

- Interest rate

- When Firms borrow money

- Firms should pay the loan + the interest rate

Cost of borrowing

- Cost of Capital

No. of machines

Variable Cost

it changes with output

Examples:-

Cost of Labor

Wage $\Rightarrow$ Salary

Cost of raw materials

1 E.g. $\Rightarrow$ Making a pizza requires having tomato paste + cheese + other odd ones
raw materials are what make a pizza become a pizza

2 E.g. $\Rightarrow$ A cow can benefit us in two ways:-

- Getting milk - Getting beef

Two Important Things

In the short run we have both fixed cost and variable

In the long run all costs are variable

- No Fixed cost -

At which price should the firm shutdown?

* Stop producing in short Run *

$$TR = P \times Q$$

$$P = \frac{TR}{Q}$$

TR per unit

Average revenue

Revenue per unit

Average
(Total cost, Fixed cost, variable cost)

$$① ATC = \frac{TC}{Q}$$

$$② AVC = \frac{VC}{Q}$$

$$③ AFC = \frac{FC}{Q}$$

In short run:-

Firms should shutdown

if $P < AVC$

loss = Fixed cost

P Greater than
Average variable cost

In long run:-

Firms should exit the market

if $P < ATC$

P Greater than
Average total cost

$$p = 15$$

Q	TC = (FC + VC)	AVC
0	(30 + 0)	—
1	30 + 20	20
2	30 + 35	17.5
3	30 + 45	15
4	30 + 60	15
5	30 + 80	16
6	30 + 110	18.3

$$\frac{VC}{Q}$$

We are here in the short run because we have fixed cost

$$TC = FC + VC$$

$$TC = FC + 0$$

The firm should not shut down

Lucy's Lasagna is a price taker that has the following costs:

Output (plates per hour)	Total cost (dollars per hour)
0	5
1	20
2	26
3	35
4	46
5	59

If lasagna sells for \$7.50 a plate, what is Lucy's profit-maximizing

The firm has No ability (power) to change The price!

Price is constant

$$p \times Q$$

$$\downarrow$$

$$\frac{\Delta TR}{\Delta Q}$$

Max rule profit

$$MC = MB$$

$$\frac{\Delta TC}{\Delta Q}$$

Marginal Cost and Average Costs

- **Marginal cost (MC)** is the increase in total cost that results from a one-unit increase in output.
- **Average fixed cost (AFC)** is total fixed cost per unit of output.
- **Average variable cost (AVC)** is total variable costs per unit of output.
- **Average total cost (ATC)** is the total cost per unit of output. $ATC = AFC + AVC$.

change in

$$\frac{\Delta TC}{\Delta Q}$$

$$\frac{FC}{Q}$$

$$\frac{VC}{Q}$$

$$\frac{TC}{Q}$$

it is also known as Quantity

Labor	Output	Fixed cost (dollars)	Variable cost (dollars)	Total cost (dollars)	Average fixed cost (dollars)	Average variable cost (dollars)	Average total cost (dollars)	Marginal cost (dollars)
0	0	50	0	50				10.00
1	10	50	100	150	5.00	10.00	15.00	5.00
2	30	50	200	250	1.66	6.67	8.33	16.67
3	36	50	300	350	1.39	8.33	9.72	

not given not given not given not given $\Rightarrow \frac{\Delta TR}{\Delta Q}$

Long-Run Cost

In the long run, a firm can vary the level of all resources so both labor and capital are variable inputs. As a result, in the long run all costs are variable costs.

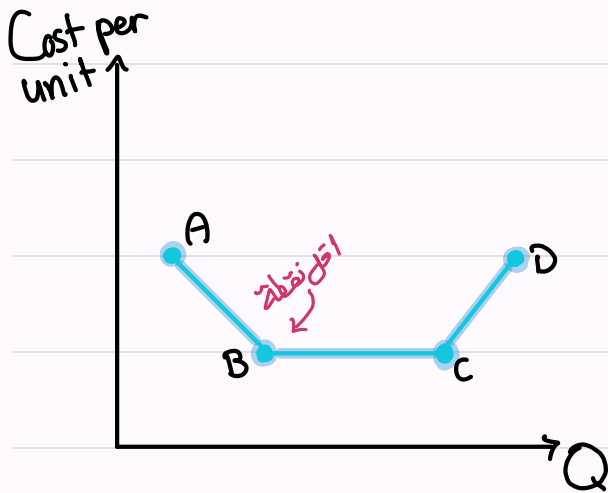
because in the long run we don't have Fixed cost!

Average total Cost!

$$ATC = \frac{TC}{Q}$$

Cost per unit

Long-run ATC curve



• A → B
 $\uparrow Q \downarrow ATC$
Efficient
Cost per unit
Economies of scale!

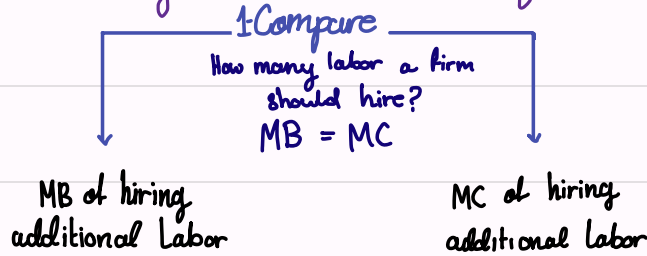
• B → C
 $\uparrow Q \rightarrow$ No change in ATC
Constant returns to scale!

• C → D
 $\uparrow Q \uparrow ATC$
Diseconomies of scale

Diseconomies of scale refer to the negative effects (decreasing returns) that can occur when a company grows too large and becomes inefficient. These negative effects can result in higher long run average costs (LRAC) and reduced profitability.

How many labor a firm should hire?

To ways to answer this question



$\uparrow Q = 2$ $p = 10$ $>$ 10

$p \times Q \Rightarrow 10 \times 2 = 20$ \$20

2 - MB of hiring additional labor

→ we should not hire additional labor

if $MB = 0$

Do not hire if $MB = 0$

Example 8:

Labor	TP	AP	MPL
0	0	—	—
1	10	10	10
2	25	12.5	15
3	35	11.7	10
4	40	10	5
5	42	8.4	2
6	42	7	0

only hire of 5, no need to hire of 6

Law of diminishing return

The more numbers of labor increases the Marginal product of labor decreases

After the second labor

$\uparrow$ Labor
 $\downarrow$ MPL

* Average product = $\frac{\text{Output}}{\text{No. of workers}}$
 "labor productivity" output per worker

Law of diminishing returns

$\uparrow$ Labor $\downarrow$ MPL

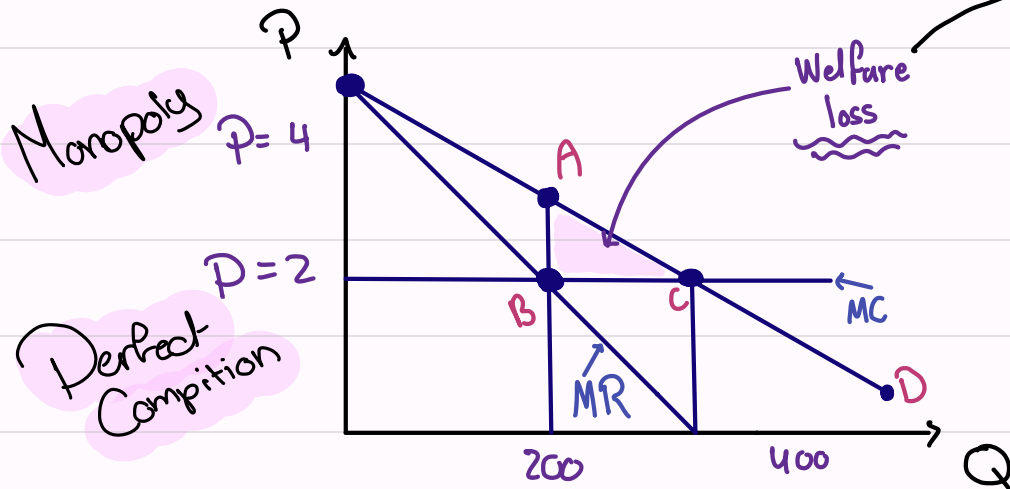
* Marginal product = $\frac{\Delta \text{Output}}{\Delta \text{Labor}}$
 Marginal benefit of hiring additional worker

(Draw a graph to show welfare loss due to Monopoly)

Monopoly VS Perfect Competition

$$\frac{1}{2} \times H \times B$$

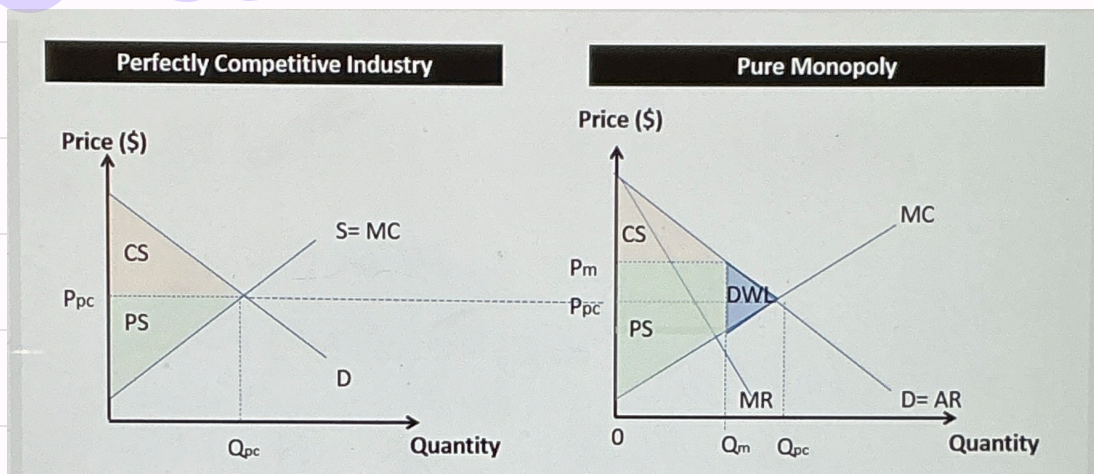
$$= \frac{1}{2} \times 2 \times B$$



* Profit $\Rightarrow TC - TR$
* $MC = \frac{\Delta TC}{\Delta Q}$, $MR = \frac{\Delta TR}{\Delta Q}$
* $ATC = \frac{TC}{Q}$ * $AFC = \frac{FC}{Q}$ * $AVC = \frac{VC}{Q}$
* $TC = FC + VC$ $MPL = \frac{TP}{\text{Labor Output}}$
* $TR = P \times Q$ $AP = \frac{\text{Output}}{\text{No. of workers}}$
* Welfare loss $\rightarrow \frac{1}{2} \times H \times B$

* Perfect competition $P=2$, $Q=400$

* Monopoly $P=4$, $Q=200$



Source: <https://economics-tuition.sg/monopoly-efficiency/>

Readings:

"If you are a firm, and you need to make one more unit of a good, then the cost to you of that good is the marginal cost of that good. To make the good, you need to recover, at a minimum, your marginal cost. Therefore, the supply curve IS the marginal cost curve" Source: <https://www.e-education.psu.edu/ebf200/node/238#:~:text=Well%2C%20if%20you%20are%20a,IS%20the%20marginal%20cost%20curve.>

The marginal cost curve is thus not the supply curve for monopoly. As a price maker that controls the market, monopoly reacts to demand conditions, especially the price elasticity of demand, when setting the price and corresponding quantity produced. Source: "https://www.amosweb.com/cgi-bin/awb_nav.pl?s=wpd&c=dsp&k=monopoly,+short-run+supply+curve#:~:text=The%20marginal%20cost%20curve%20is,price%20and%20corresponding%20quantity%20produced."

Example 8-

Example 8-

P

Qd

TC

TR

MR

MC

Step 1

Step 2

Step 3

$$\frac{\Delta TR}{\Delta Q}$$

$$\frac{\Delta TC}{\Delta Q}$$

P	Qd	TC	TR	MR	MC
20	x	20	0	0	0
18	x	21	18	18	1
16	x	24	32	14	3
14	x	30	42	10	6
12	x	40	48	6	10
10	x	55	50	2	15

عشرون
TR

x

0

1+

3+

6+

10+

15+

+14

+10

+16

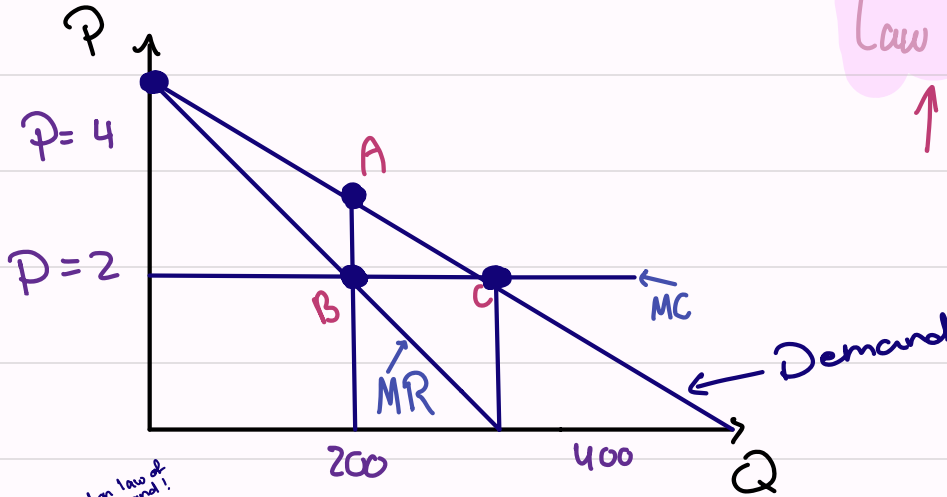
2

$$\frac{6+10}{2}=8$$

$$\frac{10+6}{2}=8$$

Monopoly because the Price is Changing

Monopoly because the Price is Changing



Law of demand

$\uparrow P \downarrow Q_d$

Important

Prove that the MR is twice the slope of demand Curve?

Intercept based on law of demand!

Slope

(Total Revenue) $P = a - bQ$

$TR = P \times Q$

$TR (a - bQ) \times Q$

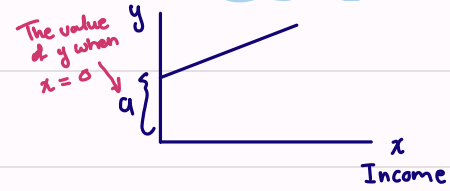
$TR = (aQ - bQ^2)$

$\frac{\Delta TR}{\Delta Q} MR = a - 2bQ$

$P = a - 1bQ$

$MR = a - 2bQ$

Consumption



MR Slope is twice the slope of demand curve!

$Slope = \frac{\Delta y}{\Delta x}$

Monopoly

$3x^2 \rightarrow 6x$

$x^3 \rightarrow 3x^2$

$x \rightarrow 1$

Example 8-

Slope 0.75

$\uparrow x = 1 \text{ unit} \Rightarrow 0.75 = 0.75$

$\uparrow y = 0.75 \text{ unit}$

$\uparrow Q \quad \downarrow ATC$

12. The following table shows quantity (Q), total cost (TC), and average total cost (ATC) for the three firms:

		Firm A		Firm B		Firm C	
Quantity		TC	ATC	TC	ATC	TC	ATC
Q_1	1	\$60	\$60	\$11	\$11	\$21	\$21
Q_2	2	70	35	24	12	34	17
Q_3	3	80	26.7	39	13	49	16.3
Q_4	4	90	22.5	56	14	66	16.5
Q_5	5	100	20	75	15	85	17
Q_6	6	110	18.3	96	16	106	17.7
Q_7	7	120	17.1	119	17	129	18.4

Firm A has economies of scale because average total cost declines as output increases. Firm B has diseconomies of scale because average total cost rises as output rises. Firm C has economies of scale from one to three units of output and diseconomies of scale for levels of output beyond three units.

Market Structure

Characteristics	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Number of firms in industry	Many $\rightarrow$ has many firms	Many	Few	One $\rightarrow$ only one firm
Product	Identical	Differentiated	Either identical or differentiated	No close substitutes
Barriers to entry	None	None	Moderate	High
Firm's control over price	None	Some	Considerable	Considerable or regulated
Concentration ratio	0	Low	High	100
HHI (approx. ranges)	Less than 100	101 to 999	More than 1,000	10,000
Examples	Wheat, corn	Food, clothing	Automobiles, cereals	Local water supply

Market Power

Natural
Economies of scale
 $\downarrow$
 $\uparrow Q \quad \downarrow ATC$

Legal
Copyright
 $\downarrow$
• Software
• Books
Patent
 $\downarrow$
• Hardware
• Cellphone

$\rightarrow$ Strong Tech & Financial capabilities

In Monopoly $\rightarrow$ Price is based on Q_d

Market Power $\rightarrow$ The ability to raise the price!
No market power $\rightarrow$ the price stays constant
Firms are Price takers!

Legal
&
Natural
 $\swarrow$
by Government

Less than 60%

MEASURES OF CONCENTRATION

There are two measures of market concentration:

CR 4

- The **four-firm concentration ratio** is the percentage of the value of sales accounted for by the four largest firms in the industry. The four-firm concentration ratio ranges between near 0 (extremely competitive) to 100 (not very competitive). More specifically, if CR4 is less than 60%, then the market is competitive.

Notes:

- If a firm has a market share 50 to 90 percent, this firm is called dominant firm.
- If market share at or near 100 percent, this firm is a monopoly.

- The **Herfindahl-Hirschman index (HHI)** is the square of the percentage market share of each firm summed over the largest 50 firms (or summed over all the firms if there are fewer than 50) in a market. The HHI ranges between near 0 (extremely competitive) to 10,000 (a monopoly).
- The U.S. Justice Department uses the HHI to classify markets:
 - Markets with an HHI of less than 1,000 are regarded as highly competitive
 - Markets with an HHI of between 1,000 and 1,800 are regarded as moderately competitive.
 - Markets with an HHI above 1,800 are regarded as concentrated.

• The **four firm concentration ratio** is the percentage of the value of sales accounted for by the four largest Industry

• The **Herfindahl-Hirschman Index (HHI)** is the square of the percentage market share of each firm summed over the largest 50 firms

Problems:

- Sales of the firms in the pet food industry are:

Sales (thousands of dollars)

Big Collar, Inc.	50
Shiny Coat, Inc.	75
Friendly Pet, Inc.	60
Nature's Way, Inc.	65
Other 8 firms	400

$$CR4 = \frac{\text{Largest four firms sale}}{\text{Total sales in the industry}} \times 100$$

$$CR4 = \frac{50 + 75 + 60 + 65}{50 + 75 + 60 + 65 + 400} \times 100 = 38\%$$

This in the exam can be changed
Others ما نغير على كل ما ممكن تكون كلمة ثانية

- Calculate the four-firm concentration ratio.

- What is the structure of the industry?

0 perfect company

Less than 60% Monopolistic Company

60% → 99.9% → Oligopoly 100% Monopoly

- Market shares of mat makers are:

Market share (percent)

Made-to-Last, Inc.	(20) ² = 400
Big Wheel, Inc.	(17) ² = 289
Magic Carpet, Inc.	(22) ² = 484
Supreme, Inc.	(17) ² = 289
Copra, Inc.	(24) ² = 576

we add them

- Calculate the Herfindahl-Hirschman Index.

- What is the structure of the industry?

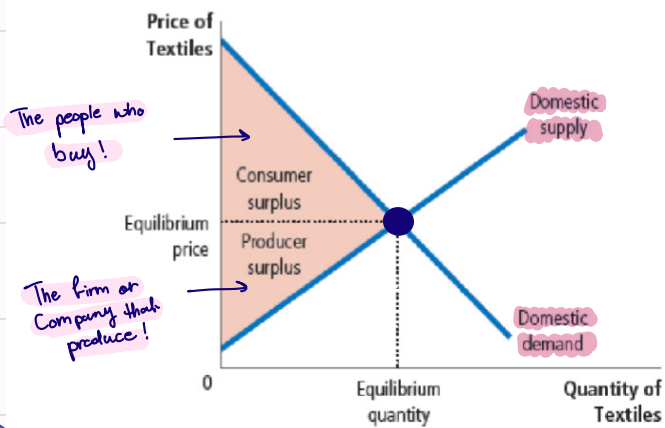
$$= 2038 \rightarrow HHI$$

More than 1000 and less than 10,000

The market is Oligopoly

If = 10,000 → Monopoly

The Equilibrium without Trade



Example: Selling domestic products to foreign countries such as
Kuwait exports Oil to China

The World Price and Comparative Advantage

- P_W = the **world price** of a good
- P_D = domestic price without trade.
- If $P_D < P_W$,
 - country has comparative advantage in the good.
 - under free trade, country exports the good.
- If $P_D > P_W$,
 - country does not have comparative advantage.
 - under free trade, country imports the good.

$P_W \Rightarrow$ The world price

$P_D \Rightarrow$ The domestic price without trade

if $P_D < P_W$

Country exports the good $\Rightarrow$ Kuwait exports Oil for others

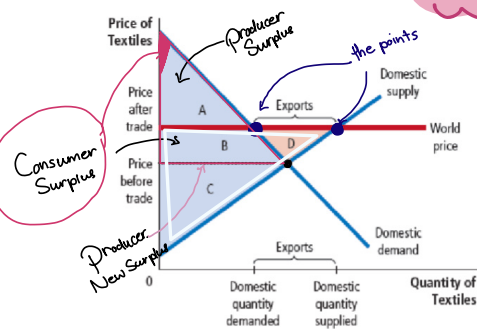
if $P_W < P_D$

Country imports the good $\Rightarrow$ Kuwait importing cars from others

	Before trade	After trade	Change
CS	$A + B$	A	$-B$
	C	$C + B + D$	$+B + D$
PS	$A + B + C$	$A + B + C + D$	$+D$

Calculate the gain from trade

The Gains and Losses of an Exporting Country



The new Producer Surplus is **C** point so it means less profit

Exports is point D

The Gains and Losses of an Exporting Country

Winners

	Before Trade	After Trade	Change
Consumer Surplus	$A + B$	A	$-B$
Producer Surplus	C	$B + C + D$	$+(B + D)$
Total Surplus	$A + B + C$	$A + B + C + D$	$+D$

profit

loss

Gain

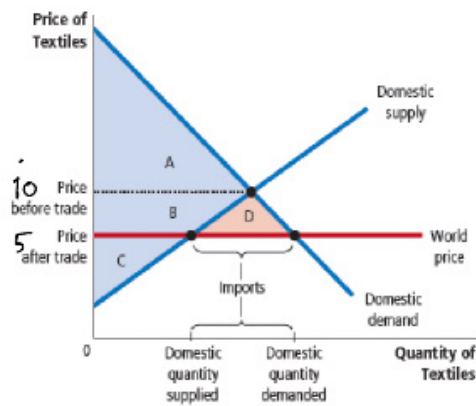
losers

The area D shows the increase in total surplus and represents the gains from trade.

Import: Kuwait purchases foreign products from foreign countries

→ Example: Kuwait imports cell phone from the USA

The Gains and Losses of an Importing Country



Calculate
the Gain from
trade

The Gains and Losses of an Importing Country

	Before Trade	After Trade	Change
Consumer Surplus	A	A + B + D	+(B + D)
Producer Surplus	B + C	C	-B
Total Surplus	A + B + C	A + B + C + D	+D

The area D shows the increase in total surplus and represents the gains from trade.

Winner

loser

Active Learning 1

Analysis of trade

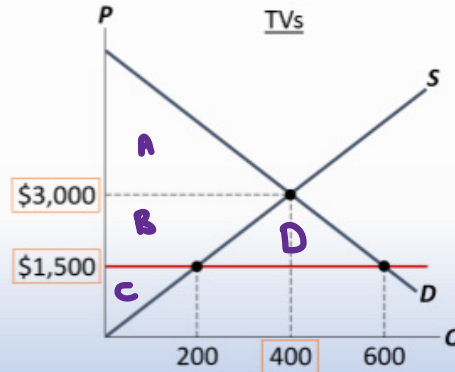
Without trade,

$$P_D = \$3,000, Q = 400$$

In world markets,

$$P_W = \$1,500$$

1. Under free trade, how many TVs will the country import?
2. Identify CS, PS, and total surplus without trade, and with trade.

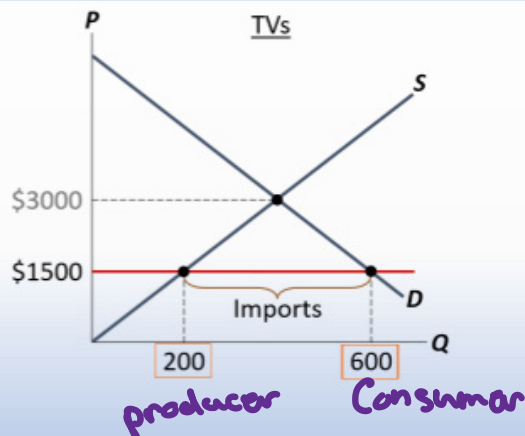


Active Learning 1

Answers

Under free trade,

- domestic consumers demand 600
- domestic producers supply 200
- imports = 400



Active Learning 1

Answers

Without trade,

$$CS = A$$

$$PS = B + C$$

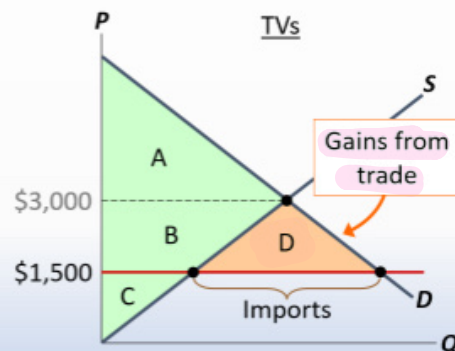
$$\text{Total surplus} = A + B + C$$

With trade,

$$CS = A + B + D$$

$$PS = C$$

$$\text{Total surplus} = A + B + C + D$$



Two Principles of Economics

Markets are usually a good way to organize economy activity

Governments can sometimes improve market outcomes

- **Externalities**: are a form of market failure - the uncompensated impact of one person's action on the well-being of bystander.

Externalities can be

Negative example: Pollution

affected but does not take part

A cost or a benefit that arises from production or consumption of a good and that indirectly affects others

meaning other than it's producer or consumer

easy definition! positive

it encourage people to be more educated & encourage government to subsidize the education

↑ education ⇒ Shows in the positive externalities graph

Technology spillovers

Education 1 ⇒ More people educated

↓ Crimes rate

↑ Informed voters leads to better Government

2 ⇒ innovative & well educated people receive high wages

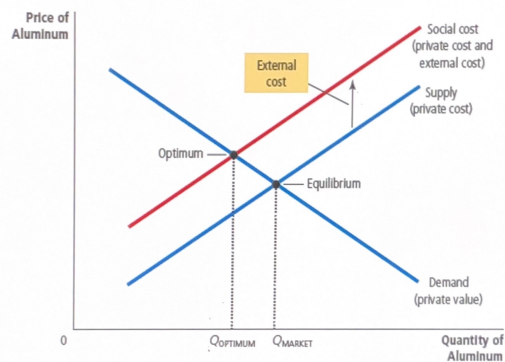
Private individuals and public policymakers may remedy this type of market failure.

Welfare Economics: A Recap

- The market equilibrium maximizes consumer & producer surplus.
- The Supply Curve Shows **private cost** - the costs directly incurred by sellers.
- Demand Curve Shows **private value** - the value to buyers (the prices they are willing to pay).

Negative Externalities

Example: Aluminum factories emitting pollution



↑ Smoke
↑ Health risk

Q_{Optimum} is smaller than Q_{market}

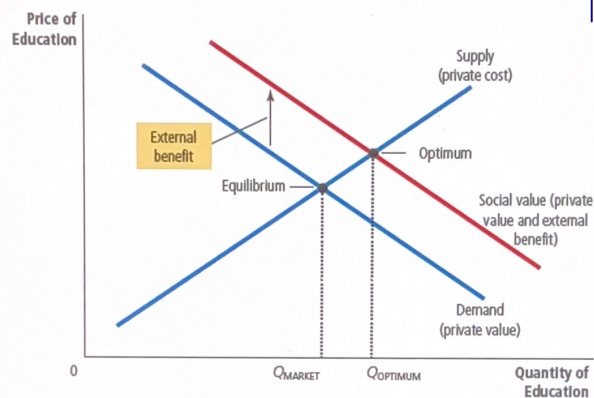
Corrective tax

Imposing taxes : may make the producers take into account the external effect of their actions.

مثال : وضع ضرائب على المصانع بسبب كثرة صنالك البيئية!

Positive externalities

Example: Education



it encourage people to be more educated & encourage government to subsidize the education

↑ Education ⇒ Shows in the positive externalities graph

Positive externalities

In the presence of a positive externality, the **social value** of good includes:

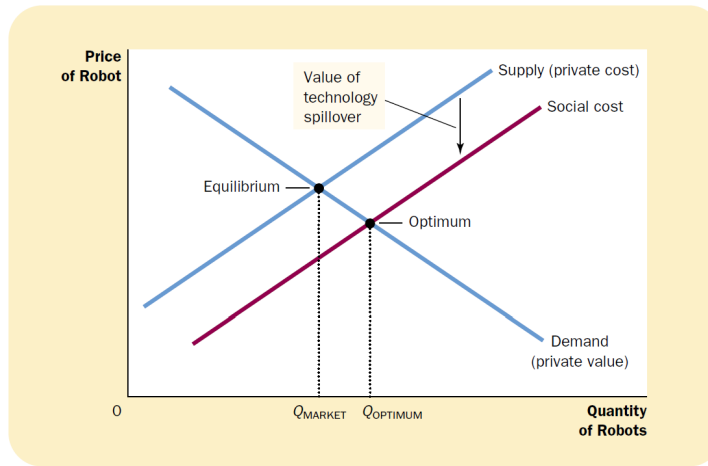
- **Private value** - the direct value to buyers
- **External benefit** - the value of the positive impact

The **Socially optimal Q** maximizes welfare:

- At any lower Q , the social value of additional units exceeds their cost.
- At any higher Q , the cost of the last unit exceeds its social value.

Figure 10-3

TECHNOLOGY SPILLOVERS AND THE SOCIAL OPTIMUM. In the presence of a positive externality to production, the social cost of producing robots is less than the private cost. The optimal quantity of robots, Q_{OPTIMUM} , is therefore larger than the equilibrium quantity, Q_{MARKET} .



Robots are at the frontier of a rapidly changing technology. Whenever a firm builds a robot, there is some chance that it will discover a new and better design. This new design will benefit not only this firm but society as a whole because the design will enter society's pool of technological knowledge. This type of positive externality is called a *technology spillover*.

↑ Technology

↑ Innovation by other firms to discover better technology or design

} Producing more robots

Society as a whole will benefit

the government can internalize

the externality by subsidizing the production of robots

↓
Corrective Subsidies ⇒ Will make the market equilibrium closer to the social optimum $Q_{\text{market}} \Rightarrow Q_{\text{optimum}}$

↓
A subsidy a sum of money granted by the state or a public body to help an industry or business keep the price of a commodity or service low.

↓
↑ Q Robot

Two Ways of Price Discriminating

Firms price discriminate in two broad ways. They discriminate:

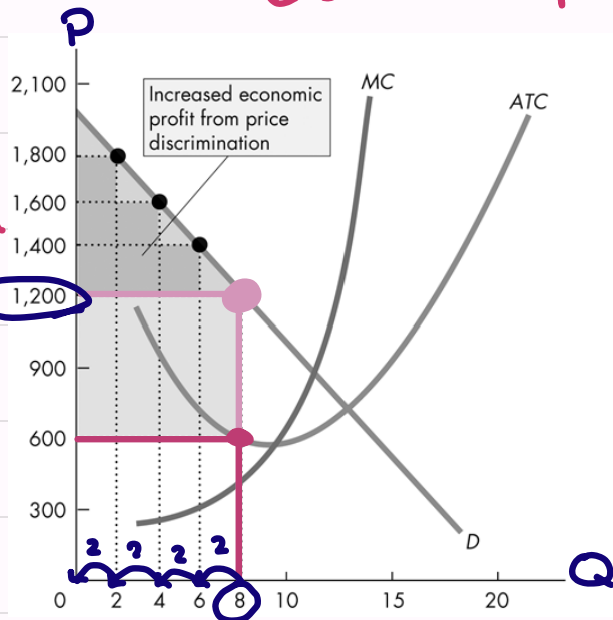
- Among groups of buyers
- Among units of a good

Two Ways of Price Discriminating

Firms price discriminate in two broad ways. They discriminate:

- Among groups of buyers
- Among units of a good

Some examples $\Rightarrow$ * Airfares * Movie tickets
* Quantity
* Discounts Coupons



Before price discrimination

Firms profit :-

Monopoly Price

$$\Rightarrow \frac{P \times Q}{TC} - \frac{TC}{Q} \times Q$$

$$(1200 \times 8) - ATC \Rightarrow ATC = \frac{TC}{Q} \times Q$$

* Group 1 $\Rightarrow P = \$1200$

* Group 2 $\Rightarrow P = \$1400$

* Group 3 $\Rightarrow P = \$1600$

* Group 4 $\Rightarrow P = \$1800$

$$= TC = 600 \times 8 = 4,800 \Rightarrow TC$$

Firms profit before price discrimination

After price discrimination

شؤون طلائع؟

$$TR = P \times Q$$

نبلش بالي price

حظنا 2 لذي اخرى بين كل نقطة 2 بال Q

Check the graph on Q side!

* Group 1 $1200 \times 2 = \$2,400$

* Group 2 $1400 \times 2 = \$2,800$

* Group 3 $1600 \times 2 = \$3,200$

* Group 4 $1800 \times 2 = \$3,600$

we add them all

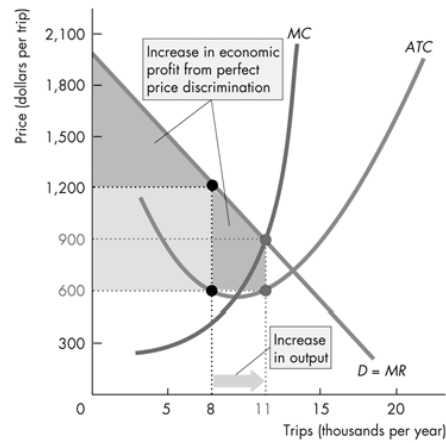
$$TR \text{ After price discrimination} = \$12,000 \Rightarrow TR - TC$$

$$12,000 - 4,800 = \$7,200 \Rightarrow \text{Profit After price discrimination}$$

D. Perfect Price Discrimination

1. **Perfect price discrimination** occurs if a firm is able to sell each unit of output for the highest price anyone is willing to pay for it. The outcome of perfect price discrimination is characterized by:
 - a) Economic profit increases above that earned by a single-price monopoly firm.
 - b) Output increases to the quantity at which $P = MC$.
 - c) Deadweight loss is eliminated.
2. Figure 12.10 shows the outcome of perfect price discrimination.

FIGURE 12.10 Perfect Price Discrimination



E. Efficiency and Rent Seeking with Price Discrimination

1. The more perfectly a monopoly can price discriminate, the closer its output gets to the competitive output where $P = MC$ and the outcome is more efficient.
2. However, this outcome differs from the outcome of perfect competition in two important ways:
 - a) The monopoly firm captures the entire consumer surplus.
 - b) The increase in economic profit attracts even more rent-seeking activity that leads to an inefficient use of resources for society.

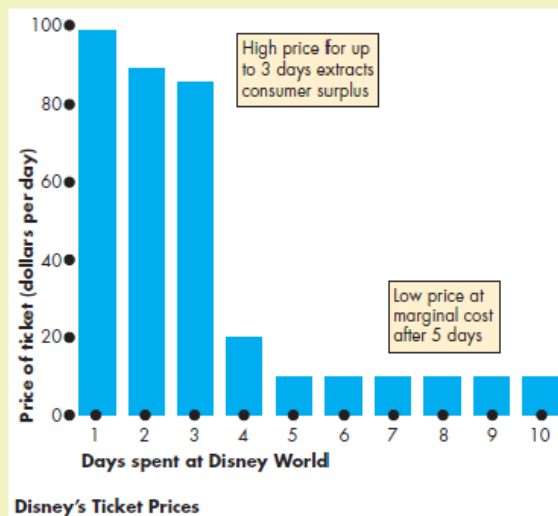
With perfect price discrimination, output increases to the point at which price equals marginal cost. This output is identical to that of perfect competition.

Economics in Action

Attempting Perfect Price Discrimination

If you want to spend a day at Disney World in Orlando, it will cost you \$99. You can spend a second consecutive day for an extra \$89. A third day will cost you \$86. But for a fourth day, you'll pay only \$20 and for more days all the way up to 10, you'll pay only \$10 a day.

The Disney Corporation hopes that it has read your willingness to pay correctly and not left you with too much consumer surplus.



$$\uparrow Q \downarrow P \Rightarrow P = MC$$

Perfect Competition

المقصد كل ما العميل اشترى تذاكر أكثر تطلع عليه
ادخل الرق اليافه

Day 1 ticket price $\Rightarrow$ \$99

Day 2 ticket price $\Rightarrow$ \$89

Day 3 ticket price $\Rightarrow$ \$20

Day 4 ticket price $\Rightarrow$ \$10

Antitrust Law regulates oligopoly firms and prevents them from behaving like monopolies.

Example:

Microsoft has violated European Union antitrust laws by bundling Teams with its other popular applications for businesses, EU officials said Tuesday, marking the bloc's latest challenge to a US tech giant.

Slack (rival) alleged that Microsoft (MSFT) had given Teams, which offers messaging, calling and video meetings, an unfair advantage by automatically including it with its Office software and thereby denying Slack an opportunity to compete on a level playing field.

According to the Commission, Microsoft has been forcing customers to acquire Teams by automatically including the tool in its Office 365 and Microsoft 365 suites.

If confirmed, the preliminary findings of an EU investigation could lead to a fine of up to 10% of Microsoft's global revenue, which totaled \$211 billion in its latest financial year.

From <<https://edition.cnn.com/2024/06/25/tech/microsoft-teams-eu-antitrust/index.html>>

May 16, 2025 (Reuters) - Microsoft (MSFT.O), opens new tab has offered to make its Office product without Teams cheaper than when sold with Teams, EU antitrust regulators said on Friday, which could spare the company a big fine and ease tensions with the United States. The European Commission said it would seek feedback from rivals and customers before deciding whether to accept the offer.

From <<https://www.reuters.com/sustainability/boards-policy-regulation/microsoft-offers-sell-office-with-teams-lower-price-eu-antitrust-probe-2025-05-16/>>

يا رب اشرح لي صدري ويسر لي أمري واحلل عقدة من لساني يفقه قلبي و افتح علي فتوح العارفين
بفضلك, اللهم لا سهل إلا ما جعلته سهلا وأنت تجعل الحزن إن شئت سهلا



