ECON3311

تلخيص من إعداد موقع

BZU-HUB

محتويات التلخيص ⬇️:

Chapter 1: Economics Models
Chapter 2: Utility and Choices
Chapter 3: Demand Curves
Chapter 6: Production
Chapter 7: Costs
Chapter 8: Profit Maximization and Supply
Chapter 9: Perfect Compitition in the Single Market
Chapter 10: Monopoly

ملاحظة:
التلخيص حسب المادة المطلوبة بالفصل الصيفي ٢٠٢٣ ويشمل النقاط الأساسية، يعني ادرسوه كمراجعة

Chapter 1: Economics Models

- **Economic Models:** Simple theoretical descriptions that capture the essentials of how the economy works.
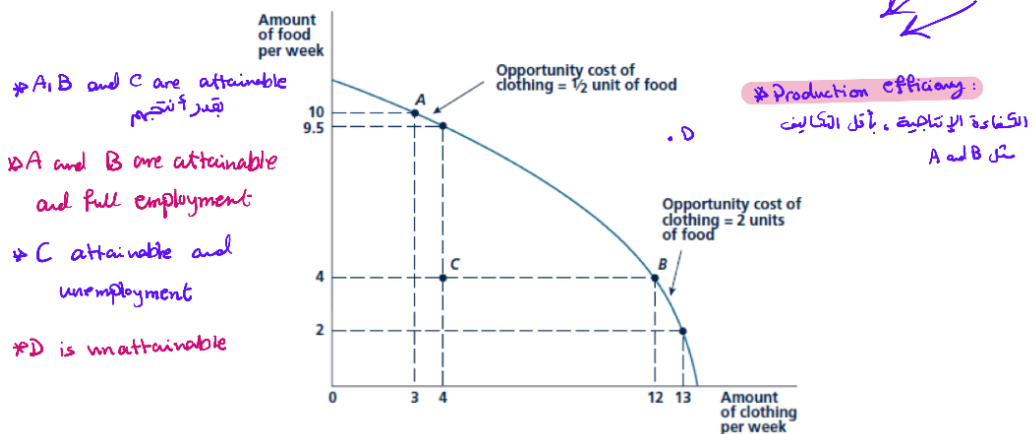
- **Basic Economic Principles**

  1 Production Possibilities Curve

  - a graph showing all possible combinations of goods that can be produced with a fixed amount of resources.

  FIGURE 1.1   Production Possibility Frontier

  * A, B and C are attainable بقدر ما نتجنب

  ▷ A and B are attainable and full employment

  * C attainable and unemployment

  * D is unattainable

  * Production efficiency: الكفاءة الإنتاجية ، بأقل التكاليف مثل A and B

  - **Opportunity Cost:** the number of units of a specific good that must be given up to obtain one more unit of another good.

  - Opportunity cost of one more unit of $A = \dfrac{\Delta B}{\Delta A}$

    ← بزيد من A

    ← لأنه slope يعني وحدة واحدة

  - **Principles:**
    1. Resources are scarce
    2. Scarcity involves opportunity costs
    3. opportunity costs are increasing

  2 The Basic Supply - Demand Model

  - To Adam Smith, the relative price of a good was determined by relative labor costs (invisible hand)
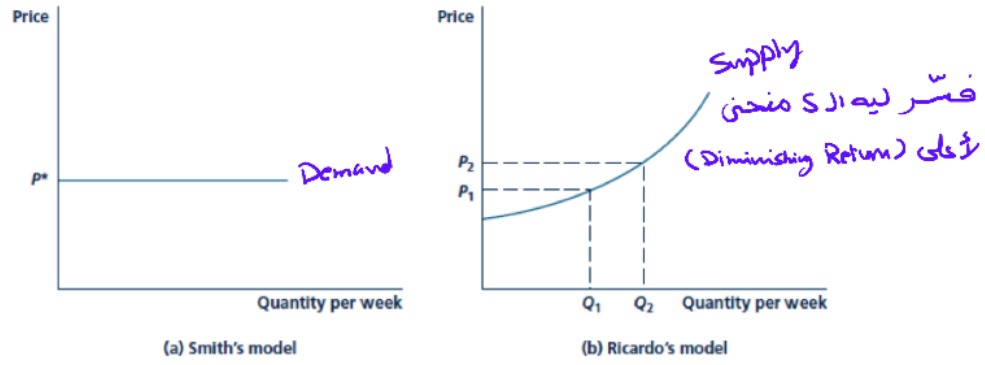
  - David Ricardo and Diminishing Returns:
    - **Diminishing Returns:** hypothesis that the cost associated with producing one more unit of a good rises as more of that good is produced. $D\uparrow$ $MC\uparrow$
    - The problem ⟶ ما حكا عن كيف نخط الأسعار

FIGURE 1.2 — Early Views of Price Determination

(a) Smith's model   (b) Ricardo's model

فسّر ليه ال S منحنى (Diminishing Return) لأعلى

• Marginalism and Marshall's Model of Supply and Demand

The negative slope of the demand curve reflects the marginalist principle: Because people are willing to pay less and less for the last unit purchased, they will buy more only at a lower price.

يعكس الميل السلبي لمنحنى الطلب المبدأ الهامشي: أن الناس على استعداد لدفع أقل وأقل مقابل آخر وحدة تم شراؤها ، فإنهم سوف يشترون أكثر بسعر أقل فقط.

The upward slope of the supply curve reflects increasing marginal cost, just as the downward slope of the demand curve reflects decreasing marginal usefulness.
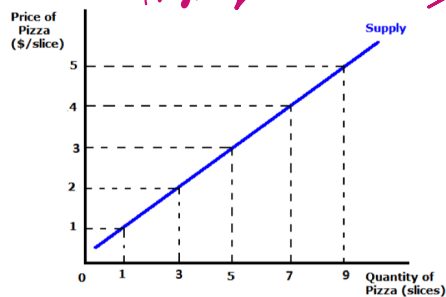
FIGURE 1.3 — The Marshall Supply-Demand Cross

ليه منحنى لأسفل ؟
↳ Diminishing utility
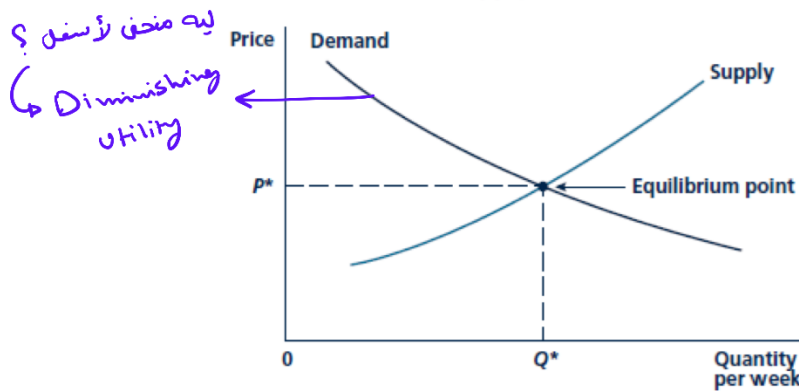
• Supply and Demand

1 The supply curve: $Q_s = Q_s(P)$

linear supply equation $\longrightarrow$ $Q_s = a + bP$

علاقة طردية ←

2 The demand Curve : $Q_D = Q_D(P)$

علاقة عكسية

linear demand equation $\longrightarrow$ $Q_D = c \ominus dP$

مثال : $Q_D = 3 - 4P$ $\longleftarrow$ إذا زاد سعر السلعة 1\$ ، تقل الكمية بـ 4 وحدات

- Normal and inferior goods
  - 1 Normal goods: income ↑ Demand ↑
  - 2 Inferior goods: income ↑ Demand ↓

- Substitute and complementary goods
  - 1 Substitute goods : goods A, B → P_A↑ , D_B↑
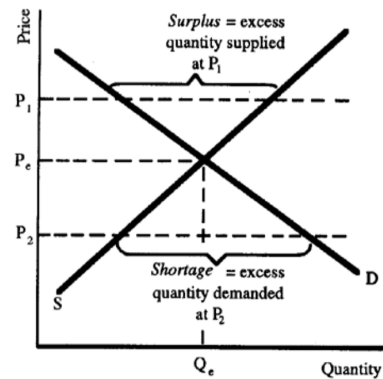 - 2 Complementary goods: goods C, D → P_C↑ , D_D↓

The demand curve also shifts to the right when an increase in the price of a substitutes good or a decrease in the price of a complementary good.

- The Market Equilibrium

  At equilibrium price : $Q_S = Q_D$
  - Surplus : $Q_S > Q_D$
  - Shortage: $Q_D > Q_S$

- Change in Market Equilibrium

  1 Shifting the Demand curve
  - D ↑ by (K):
    $Q_d' = (C+K) - dP$

  - D ↓ by (m):
    $Q_d'' = (c-m) - dP$

  2 Shifting the Supply curve
  - S ↑ by (c):
    $Q_s' = (a+c) + bP$

  - S ↓ by (d):
    $Q_s'' = (a-d) + bP$

Chapter 2: Utility and Choices
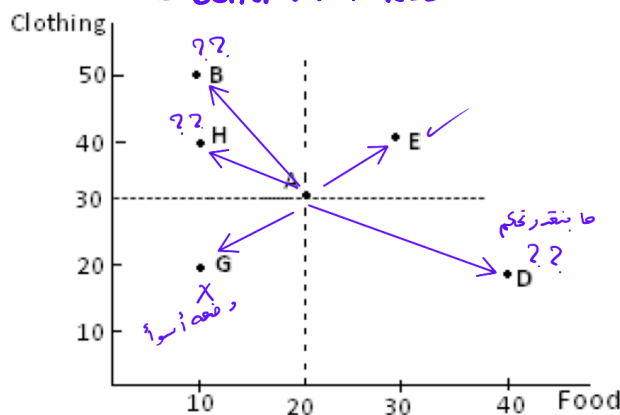
- Measuring Utility
  ↳ ordinal utility is a more realistic way to measure satisfaction.

- Consumer Preferences

  ① Completeness : Consumers can compare and rank all possible baskets. (ignoring costs)

  ② Transitivity: if A > B and B > C then A > C

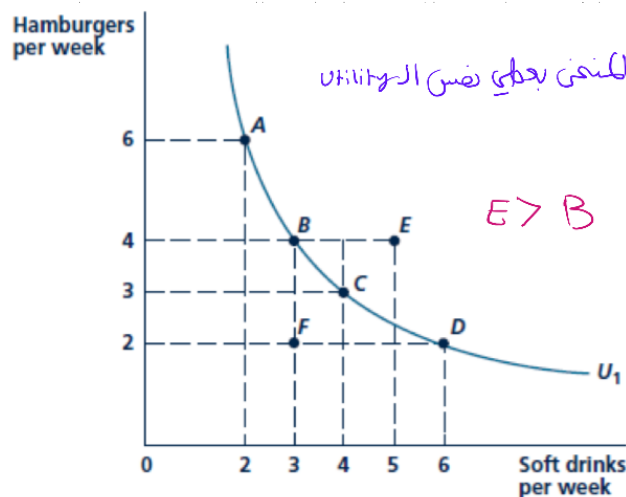 ③ More is better than less

بنزم units أكثر من السلعتين عشان ← نقول انه أفضل

- Indifference Curve منحنى السواء

A curve that shows all the combinations of goods or services (market baskets) that provides the same level of utility.

* كل النقاط على المنحنى بعطي نفس ال utility

E > B

Points above an indifference curve are preferred to points on the curve.

Points on an indifference curve are preferred to points below it.

- ## Indifference Curve and the Marginal Rate of Substitution

This person is willing to give up 2 hamburgers' in order to get one more unit of soft drinks.

المستهلك مستعد التخلي عن وحدتين من هامبورجر مقابل الحصول على وحدة إضافية من المشروبات الغازية
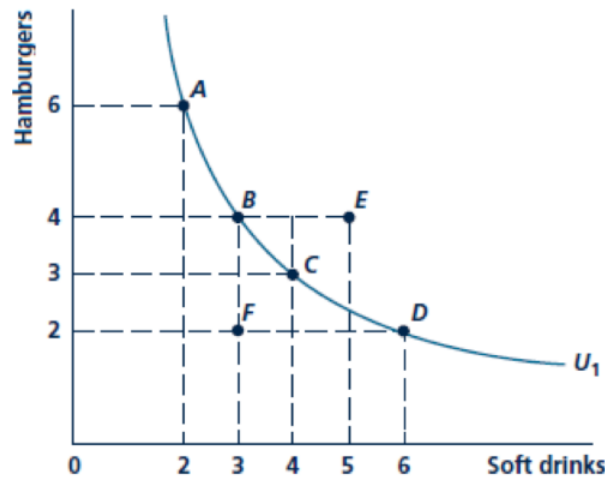
- As we move from A to D, MRS is diminishing

- indifference Curves Slope downward follows directly from our assumption that more of a good is better to less

- ## Balance in Consumption

The assumption of a diminishing MRS (or convex indifference curves) reflects the notion that people prefer variety in their consumption
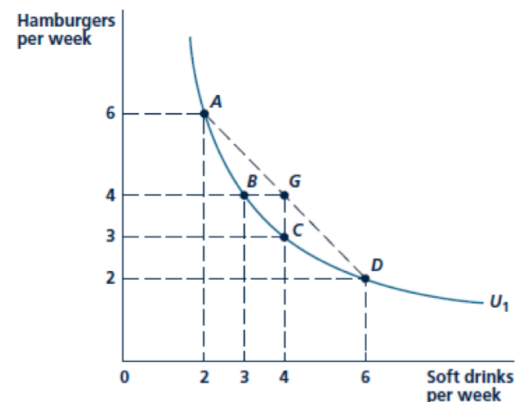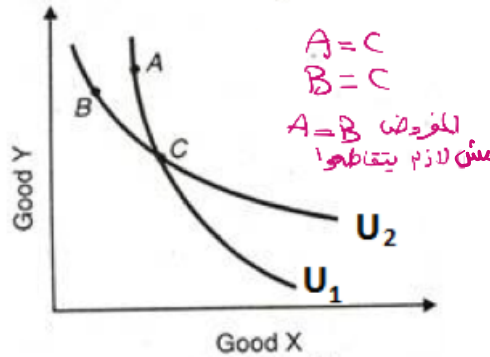
• Indifference Curve Map

Graph containing a set of indifference curves showing the market basket among which a consumer is indifferent.

خريطة منحنيات السواء هي مجموعة منحنيات السواء للمستهلك والتي تظهر تفضيله أو ذوقه تجاه السلع التي يستهلكها.
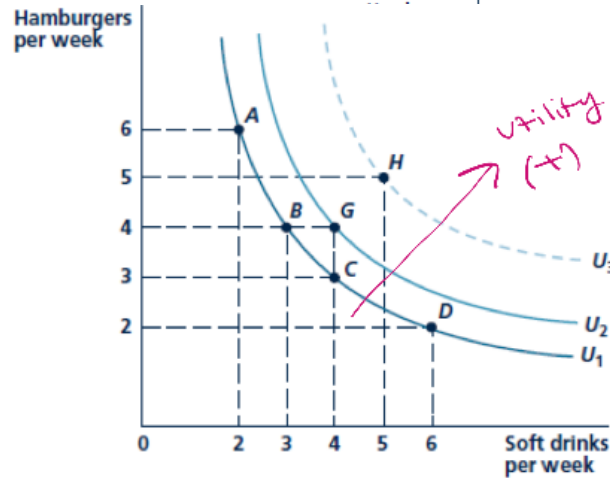
• Indifference Curves Cannot Intersect

$A = C$
$B = C$
$A = B$ المفروض
مش لازم يتقاطعوا

• Marginal Rate of Substitution and Marginal Utility

Marginal utility (MU): The additional satisfaction obtained from consuming one additional unit of a good.

The marginal utility of good X (MUX): The extra utility obtained by consuming one more unit of good X.

$$MUX = \frac{dU(X,Y)}{dx}$$ → مشتقة U بالنسبة لـ X نعتبر Y ثابت

The marginal utility of good Y (MUY): The extra utility obtained by consuming one more unit of good Y.

$$MUY = \frac{dU(X,Y)}{dY}$$

$$MRS = \frac{MUX}{MUY}$$

- Illustrating Particular Preferences
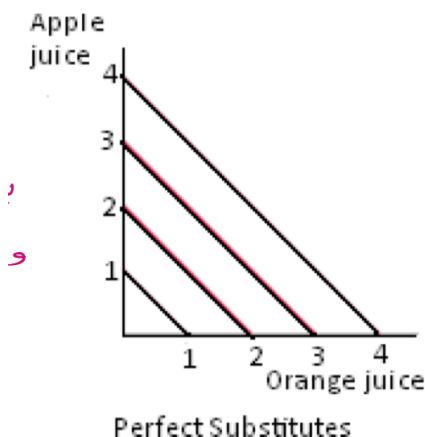
1 Perfect Substitution

The utility function for these goods: $U(X,Y) = aX + bY$

بيضل معه
وتقوّم نتم "1"

- *Perfect substitutes:* Two goods for which the marginal rate of substitution of one for the other is a constant.

فش الشي بختلفوا انم ← لسلعات بديلة

مثلًا: $2X+y$

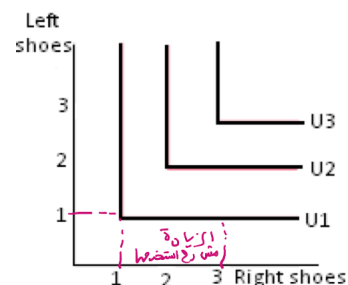Apple juice

Perfect Substitutes

2 Perfect Complements

Perfect complements: Two goods for which the MRS is infinite; the indifference curves are shaped as right angles.

The utility function for these goods: $U(X,Y) = min\{aX, bY\}$

The "min" simply means "take the minimum" of *the two values*

3 Bad Goods

Bad good: Good for which less is preferred rather than more. Less of them are preferred to more. Air pollution is a bad; asbestos in housing insulation is another.

ذباب
Houseflies per week
Bad good

كلما زاد الطعام منخفض اكثر للذباب

(b) An economic bad
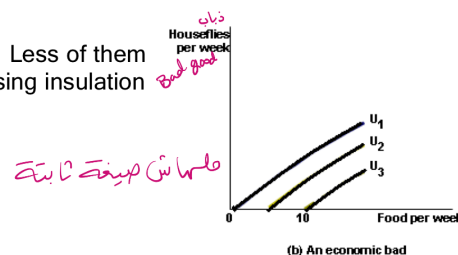
- Budget Constraints

  *Budget line equation:

  $$P_x X + P_y Y = I$$

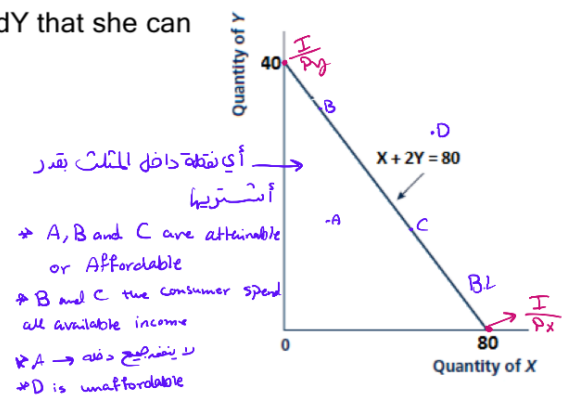The table shows various combinations of goodX and goodY that she can purchase each week with her $80.

Market Basket	goodX (X)	goodY (Y)	Total Spending
A	0	40	1*0 + 2*40 = 80
B	20	30	1*20 + 2*30 = 80
D	40	20	1*40 + 2*20 = 80
E	60	10	1*60 + 2*10 = 80
G	80	0	1*80 + 2*0 = 80

أي نقطة داخل المثلث بقدر ← أنشتريها

* A, B and C are attainable or Affordable
* B and C the consumer spend all available income
* A → دفعه صحيح لا ينفض
* D is unaffordable

The Slope of budget line:

$$P_x X + P_y Y = I$$
$$P_y Y = I - P_x X$$
$$Y = \frac{I}{P_y} \boxed{- \frac{P_x}{P_y}} X \qquad = \frac{-P_x}{P_y}$$

↳ Slope

• The Effects of Changes in Income and Prices

① Income Changes

An increase in income shifts the budget line outward

A decrease in income shifts the budget line inward

② Price Changes

A decrease in the price of food ~~to R=50~~ changes the slope of the budget line and rotates it outward.

An increase in the price of food ~~to R=2.00~~ changes the slope of the budget line and rotates it inward.
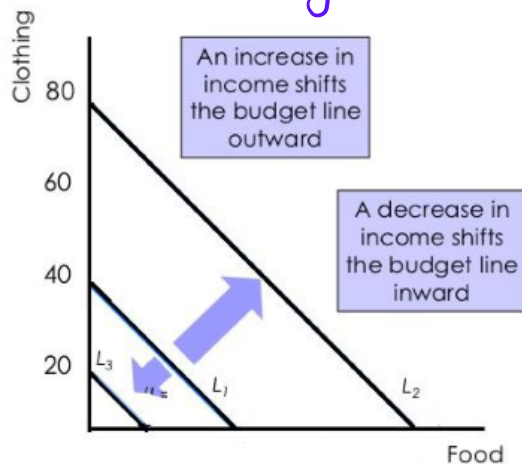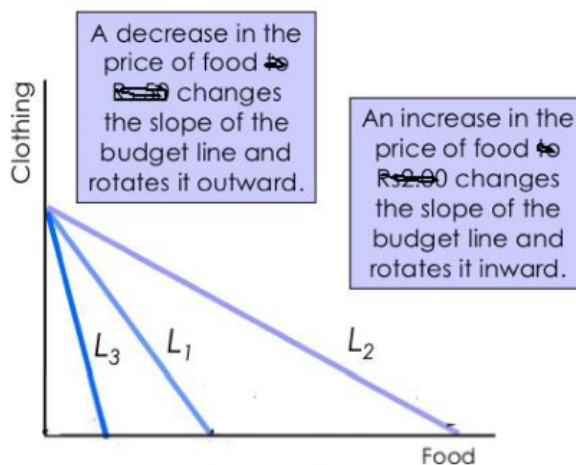
- Utility Maximization (Consumer Choice)

1. It must be located on the budget line.
2. It must give the consumer the most preferred combination of goods and services.

$$\frac{MUX}{MUY} = \frac{P_X}{P_Y} \quad \text{or} \quad \frac{MUX}{P_X} = \frac{MUY}{P_Y}$$

- من الرسمة ، النقطة A فقتها الشريطين
  Utility maximization ←
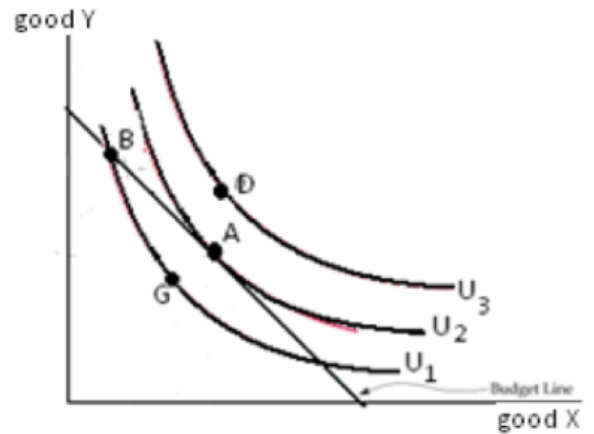
> The satisfaction (utility) is maximized at the point where: $MRS = \frac{P_X}{P_Y}$

- When utility maximization conditions not Satisfy

  1. If $\frac{MUX}{Px} > \frac{MUY}{Py}$ or $\frac{MUX}{MUY} > \frac{Px}{Py}$

  Then the Consumer Can Increase total utility by purchasing (Consuming) more of good X and less of good Y.

  2. If $\frac{MUX}{Px} < \frac{MUY}{Py}$ or $\frac{MUX}{MUY} < \frac{Px}{Py}$

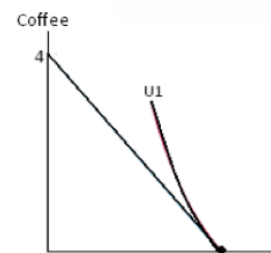 Then the Consumer Can Increase total utility by purchasing (Consuming) more of good Y and less of good X.

- Substitution and Income Effects from a Fall in price (Normal Good)

  * Q_D of X ↑
  * BL rotates Outward
  * $\frac{P_x}{P_y}$ ↓
  * Purchasing Power ↑

C	T	U(C,T) = 3C + 4T
0	4	3*0 + 4 * 4 = 16 ⇨ max
4	0	3*4 + 4*0 = 12

Ms. Caffeine should consume 4 units of tea and gets 16 utile

1 Substitution Effect
  · The new position is C
  · BL_{new} is the tanget of U_2

2 Income Effect
  · I stayed the Same
  · P and Q move in opposite directions
  · Change (+) ⟶ normal good

Chapter 3: Demand Curves

```
Individual Demand          Market Demand          Elasticity
Functions                                         Demand
```

• Individual Demand Functions

Demand function: A representation of how quantity demanded depends on prices, income, and preferences.

يعرف منحنى الطلب بأنه علاقة بين الكمية المطلوبة والعوامل المؤثرة فيها (سعر السلعة، دخل المستهلك، وذوق المستهلك)

Quantity of X demanded = $d_x (P_X, P_y, I; \text{preferences})$
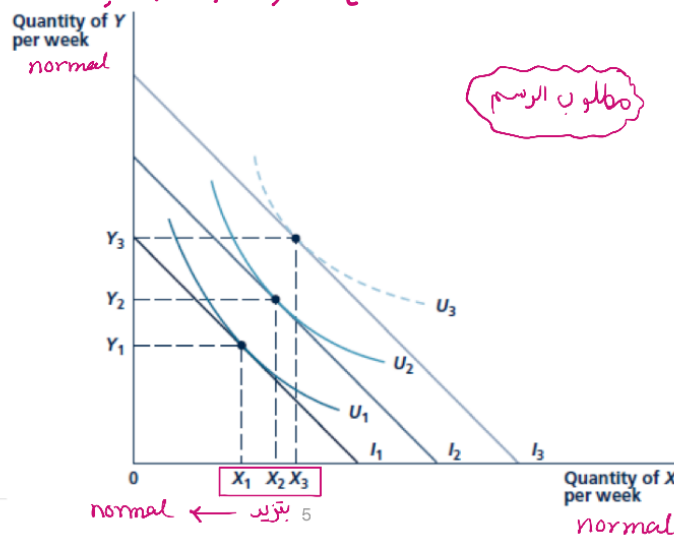
• Homogeneity

Homogeneous demand function: Quantity demanded does not change when prices and income increase in the same proportion.

تجانس منحنى الطلب : الكمية المطلوبة لا تتغيير عندما تزداد الاسعار والدخل بنفس النسبة (او القيمة). بمعنى ان الكمية المطلوبة من السلعة لا تتأثر عندما تتضاعف الاسعار والدخل.

• How a change in Consumer income and good prices affect the Consumer Choice
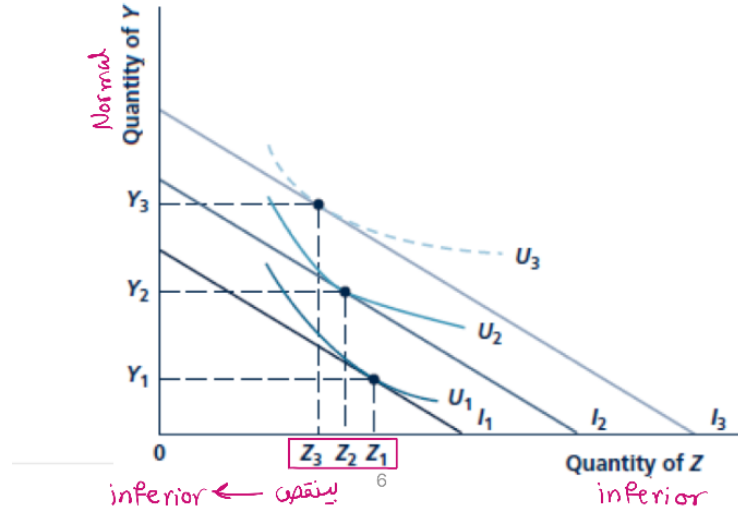
• Income Changes (Normal good)
I↑, P ثبات, Q↑

مطلوب الرسم

Quantity of Y per week normal

Y₃, Y₂, Y₁ — U₃, U₂, U₁ — I₁, I₂, I₃

X₁ X₂ X₃   Quantity of X per week normal

normal ← بتزيد   5

Luxury Good. A luxury good means an increase in income causes a bigger percent increase in demand.

- Income Changes (inferior good):
  $I\uparrow$, $P=0$, $Q\downarrow$

Normal

Quantity of Y

Y_3

Y_2

Y_1

U_3

U_2

U_1

I_1 I_2 I_3

0

Z_3 Z_2 Z_1

6

inferior ← ينقص
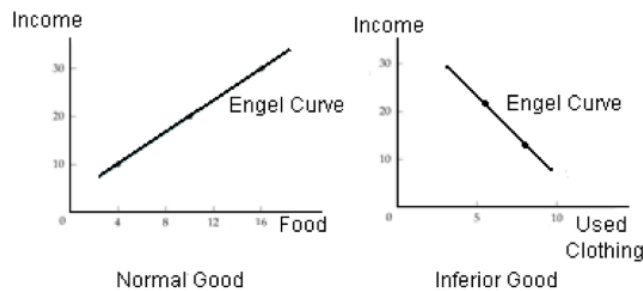
inferior

Quantity of Z

inferior

- Engel Curve

Engel curve: Curve relating the quantity of a good consumed to income.

In figure (a), food is a normal good and the Engel curve is upward sloping.

In figure(b), Used clothing is an inferior good and the Engel curve is downward sloping.

Income

30
20
10

0   4   8   12   16   Food

Engel Curve

Normal Good

Income

30
20
10

0   5   10   Used
                          Clothing

Engel Curve

Inferior Good

- How a change in a good prices affect the Consumer Choice

Substitution effect: The part of the change in quantity demanded that is caused by substitution of one good for another. A movement along an indifference curve.
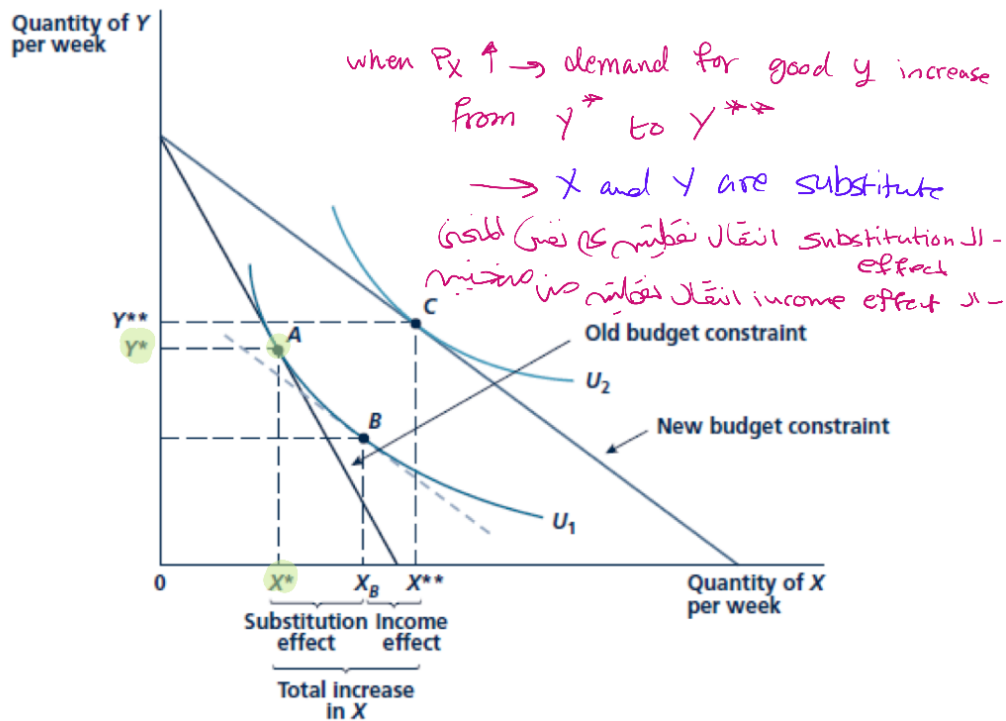
تاثير السلعة لبديلة: هو جزء من التاثير على الكمية المطلوبة ناتج عن قيام المستهلك بطلب السلعة البديلة عندما يزداد سعر السلعة. يتم تمثيلها على الرسم بالانتقال من نقطة الى نقط اخري على نفس منحنى المنفعة.

Income effect: The part of the change in quantity demanded that is caused by a change in real income. A movement to a new indifference curve.

تاثير الدخل: جزء من التاثير على الكمية المطلوبة ناتج عن تغيير في القوة الشرائية على السلعة عندما يتغيير سعرها. يتم تمثيلها على الرسم بالانتقال من نقطة على منحنى منفعة U1 الى منحنى منفعة مختلف U2.

- Substitution and Income Effects from a Fall in Price (Normal Good)

* Q_D of X ↑
* BL rotates Outward
* $\frac{P_x}{P_y}$ ↓
* Purchasing Power ↑

Quantity of Y per week

when P_x ↑ → demand for good y increase from Y^* to Y^{**}

→ X and Y are substitute

- الـ substitution effect التأثير بقيس عكس (بقيس حسب)
- الـ income effect التأثير بقيس نفس اتجاه

C

Old budget constraint

U_2

Y^{**}
Y^* A

B

New budget constraint

U_1

0   X^* X_B X^{**} **Quantity of X per week**

Substitution   Income
  effect   effect

Total increase
    in X

① Substitution Effect
 · The new position is C
 · BL_{new} is the tanget of U_2

② Income Effect
 · I stayed the Same
 · P and Q move in opposite directions
 · Change (+) ⟶ normal good

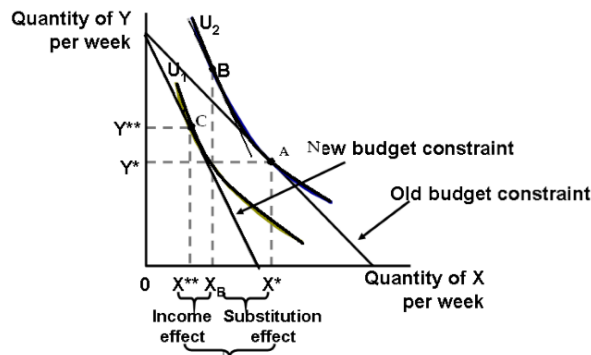Total effect (X* X**) = Substitution effect (X* X_B) + Income effect (X_B X**)

For the normal good: the direction of the substitution and income effects always the same.

- Substitution and Income Effects from an Increase in Price

  ✱ P_X ↑
  ✱ BL rotates inward
  ✱ Purchasing Power ↓
  ✱ Q_D ↓

Total effect $(X^* \, X^{**})$ = Substitution effect $(X^* \, X_B)$ + Income effect $(X_B \, X^{**})$

The substitution effect: decrease demand from X^* to X_B, and the income effect decrease demand from X_B to X^{**}. The total effects decrease demand for good X from X^* to X^{**}.

- Substitution and Income Effects for Inferior Goods

For the case of inferior goods, substitution and income effects work in opposite directions.
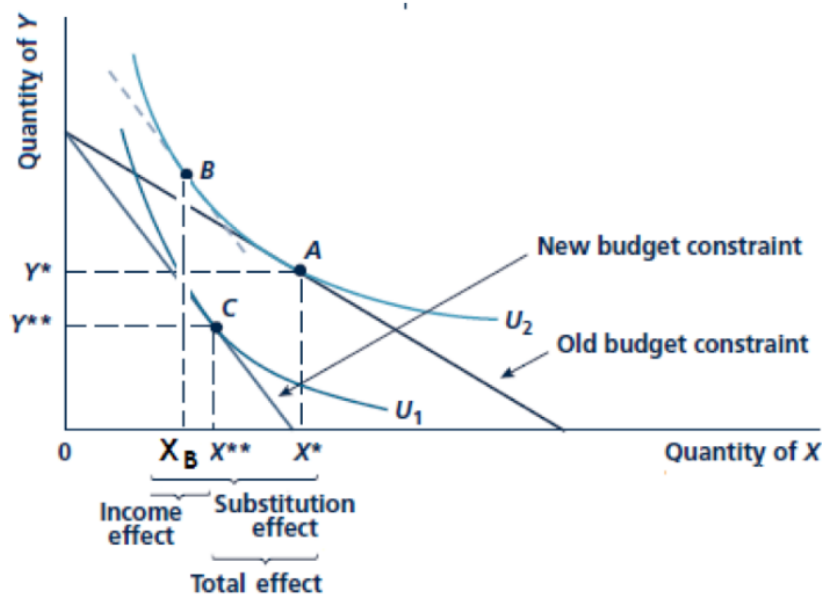
The effect of an increase in the price of good X:

The substitution effect: decrease the quantity of good X demanded from X^* to X_B

The income effect: increase in the quantity demanded of good X from X_B to X^{**}

Total effect: decrease the quantity demanded of good X from X^* to X^{**}

Total effect $(X^* \, X^{**})$ = Substitution effect $(X^* \, X_B)$ + Income effect $(X_B \, X^{**})$
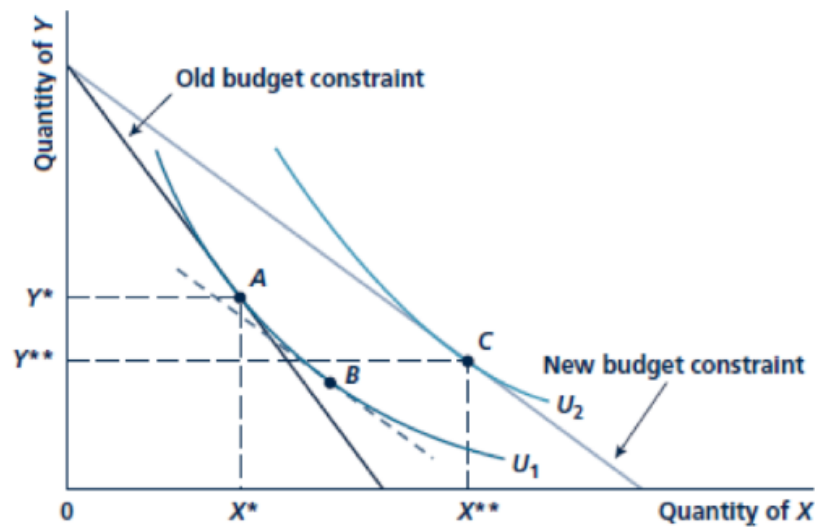
For the inferior good: the direction of the substitution and income effects work in the opposite direction

- A special Case: The Giffen Good

Giffen good: Good whose demand curve slopes upward because the income effect is larger than the substitution effect.

↳ good X is inferior
↳ income effect > Substitution effect
↳ $P_x \uparrow \longrightarrow Q_x \uparrow$

- # Changes in the Price of another Good

- When $P_x \downarrow \longrightarrow Q_y$ Changed ↓ ∴ Substitute

Complements good:

Two goods are complements if an increase in the price of one causes a decrease in the demanded of the other or a decrease in the price of one good cause an increase in the demand for the other.

Substitutes good:

Two goods such that if the price of one increase, the demand for the other rises are called substitutes. If the price of one good decreases and the demand for the other good decreases, they are also substitutes.

• Construction of Individual Demand Curves
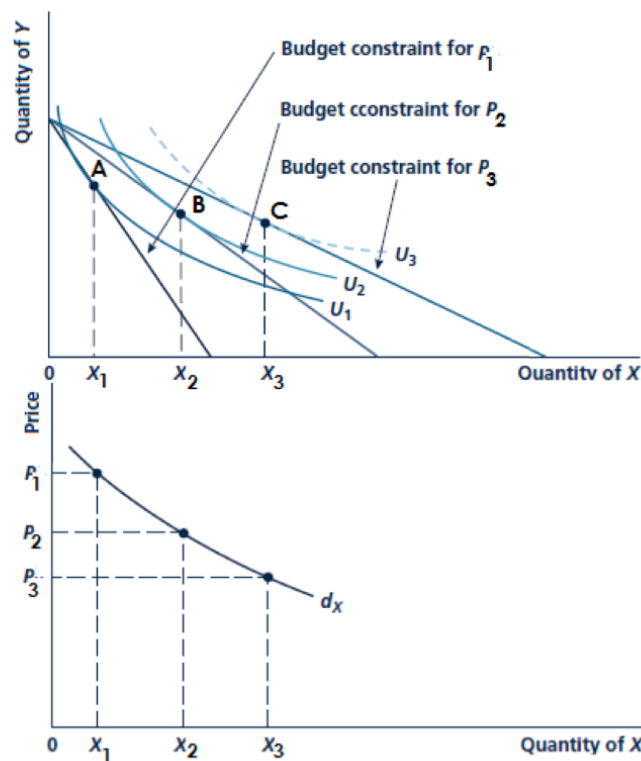
• Elasticity of Demand

Elasticity: the percentage change that will occur in one variable in response to a 1-percent increase in another variable.

$$* \, E_p = -3:$$

إذا زاد سعر السلعة بنسبة ٪1 فإن الكمية المطلوبة تقل بنسبة ٪3

$$E_p = \frac{\Delta Q}{\Delta P} * \frac{P}{Q} \quad \boxed{= \frac{dQ}{dP} * \frac{P}{Q}} \qquad \text{معامل السعر}$$

$$* \text{ if } |E_p| > 1 \implies \text{elastic}$$
$$\implies \%\Delta Q > \%\Delta P$$

$$* \text{ if } |E_p| < 1 \implies \text{inelastic}$$
$$\implies \%\Delta Q < \%\Delta P$$
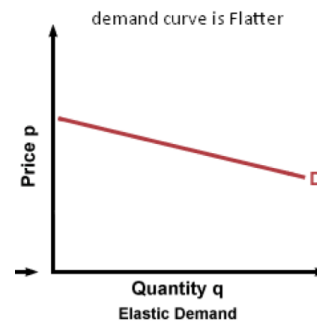
- Price Elasticity and the Shape of the Demand Curve

  - Steeper demand Curve
    $$\rightarrow \%\Delta P > \%\Delta Q$$

demand curve is steeper

Price p

D

Quantity q
Inelastic Demand

  - flatter demand Curve
    $$\rightarrow \%\Delta Q > \%\Delta P$$

demand curve is Flatter
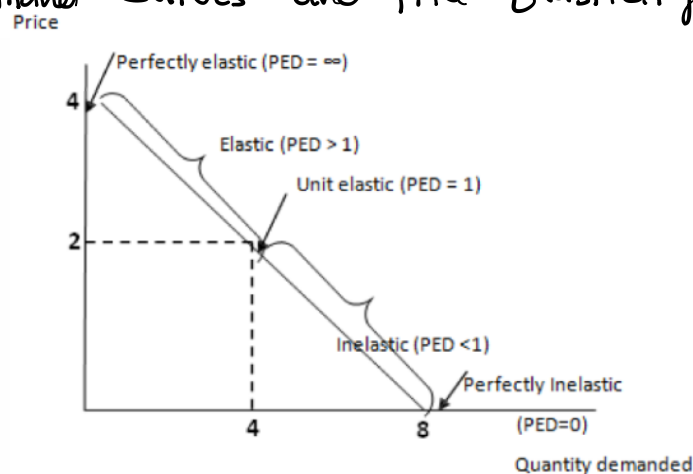
Price p

D

Quantity q
Elastic Demand
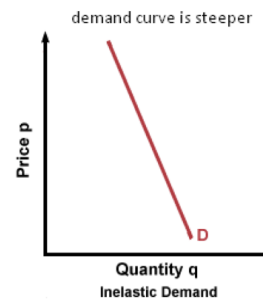
  - Flatter demand Curve is more elastic than Steeper

- Price Elasticity and the Substitution Effect

 * Many Close Substitutions $\longrightarrow$ relatively elastic

  * Few Close Substitutions $\longrightarrow$ relatively inelastic

- linear Demand Curves and Price Elasticity c

Price

Perfectly elastic (PED = ∞)

4

Elastic (PED > 1)

Unit elastic (PED = 1)

2

Inelastic (PED < 1)

Perfectly Inelastic

4   8   (PED=0)

Quantity demanded

* Slope is Constant because price is high and

Quantity is Small . While we move down
Elasticity ↓

- Infinitely Elastic & Completely Inelastic Demand

Perfectly Elastic Demand

(1) infinitely

Perfectly Inelastic Demand
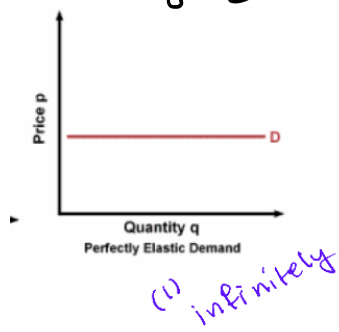
- Other Demand Elasticities

$$E_I = \frac{\Delta Q}{\Delta I} * \frac{I}{Q} \quad = \frac{dQ}{dI} * \frac{I}{Q}$$

* Normal Goods $\longrightarrow$ E_I is Positive

* Inferior Goods $\longrightarrow$ E_I is Negative

- Cross - Price Elasticity of Demand

$$E_{QA\ PB} = \frac{dQ_A}{dP_B} * \frac{P_B}{Q_A}$$

* Substitute Goods $\longrightarrow$ $E_{Q_A P_B}$ is Positive (+)

* Complements Goods $\longrightarrow$ $E_{Q_A P_B}$ is negative (−)

* Independent Goods $\longrightarrow$ $E_{Q_A P_B}$ is 0

Chapter 6 : Production

Production function: *The mathematical relationship between inputs and outputs.*

- Average and Marginal Products

  * Average Product: Output per unit of a particular input

    $\longrightarrow$ $APL = \dfrac{\text{output}}{\text{input (labor)}} = \dfrac{q}{L}$

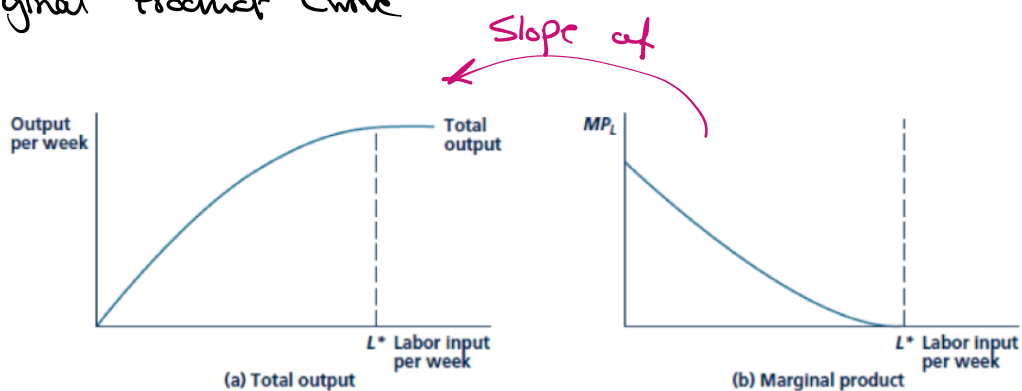 * Marginal Product: Additional output produced as an input is increased by one unit

    $\longrightarrow$ $MPL = \dfrac{\Delta q}{\Delta \text{input } (\Delta L/\Delta k)} = \dfrac{dq}{d \text{ input}}$

  Marginal product of capital (MPK) is the extra output obtained by using one more machine while holding the number of workers constant.

- Diminishing Marginal Product

  * Concave Shape $\longrightarrow$ Principle of diminishing MP
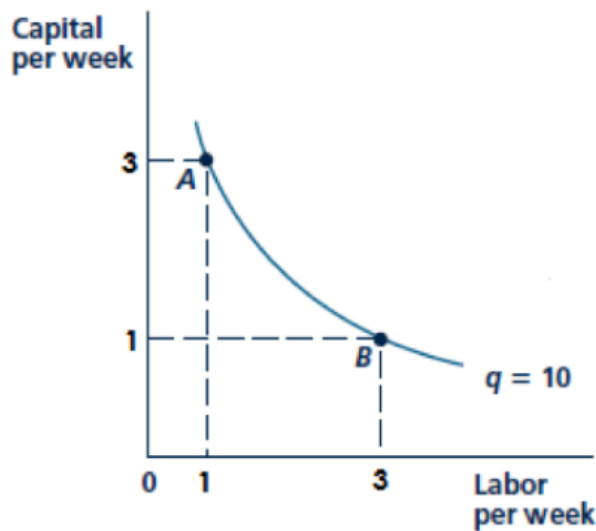
- Marginal Product Curve

  Slope of

(a) Total output — Output per week, Total output, L* Labor input per week

(b) Marginal product — MP_L, L* Labor input per week

الزيادة بسبب الـ output
labor input قل

MPL ↓ while labor input ↑

• Isoquant

Capital per week

$q = 10$

0 1 3 **Labor per week**

Isoquant map

Graph combining a number of isoquants, used to describe a production function.

Capital per week

K_A A

K_B B

$q = 30$

$q = 20$

$q = 10$

بزيد

0 L_A L_B **Labor per week**
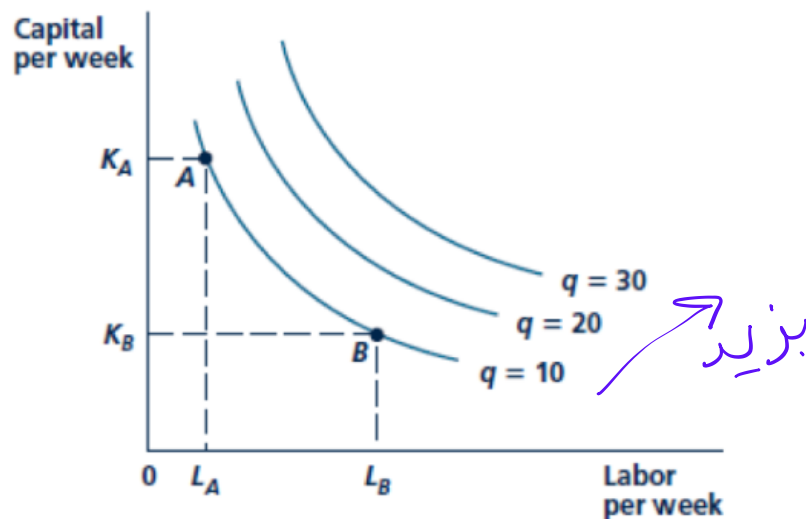
• Marginal rate of technical Substitution (RTS)

The amount by which one input can be reduced when one more unit of another input is added while holding output constant. The negative of the slope of an isoquant.

$$RTS = \frac{- \text{Change in capital input}}{\text{Change in labor input}} = \frac{-\Delta K}{\Delta L} \text{ for a fixed level of q}$$

The isoquant has a negative slope) because the firm can decrease its use of capital if one more unit of labor is employed.

- Diminishing RTS

 * Along any isoquant, the (negative) slope become flatter and the RTS diminishes

The diminishing MRTS tells us that the productivity of any one input is limited. As more and more labor is added to the production process in place of capital, the productivity of labor falls.
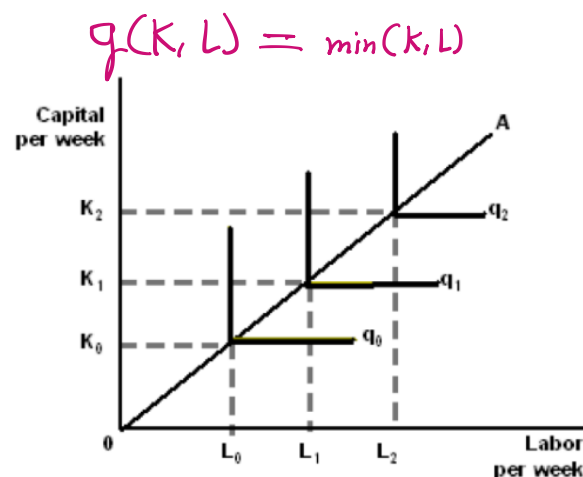
- The RTS and Marginal Products

منحنى تساوي المنتج
تغير =

 * Additional output from increased use of labor = $MP_L * \Delta L$

 * Reduction in output from decreased use of capital = $MP_K * \Delta K$

$$\frac{MPL}{MPK} = \frac{-\Delta K}{\Delta L} = RTS$$

- Production Functions - Two special Cases

① Fixed - proportion production function

$$q(K, L) = min(K, L)$$

② Isoquants with Inputs are perfect Substitutes

$$q(K, L) = aL + bK$$
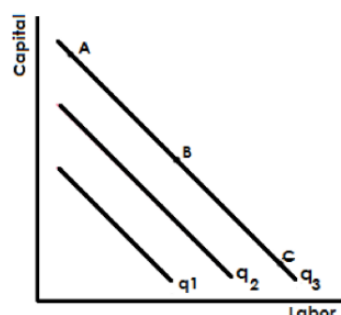
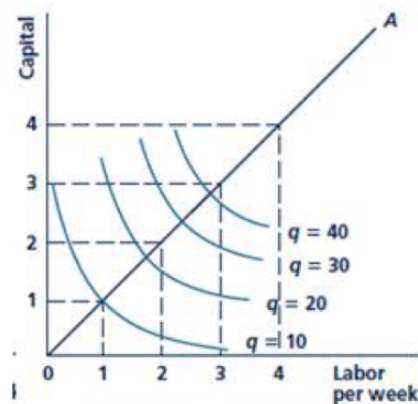- ## Changes in Technology

  Technical progress is a shift in the production function that allows a given output level to be produced using fewer inputs.
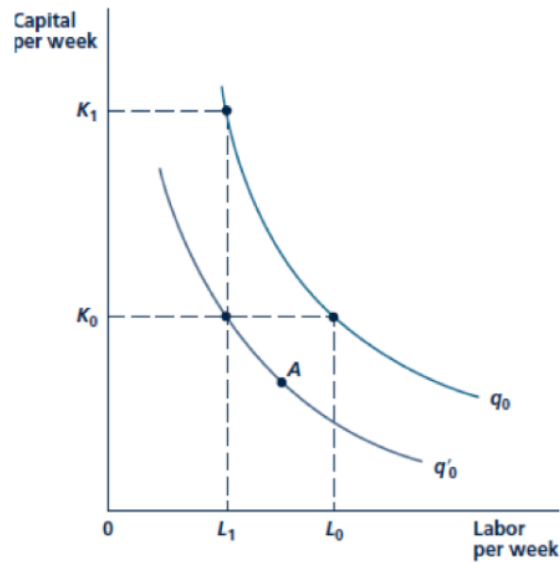
- ## Return to Scale

  Returns to scale is the rate at which output increases in response to proportional increases in all inputs.
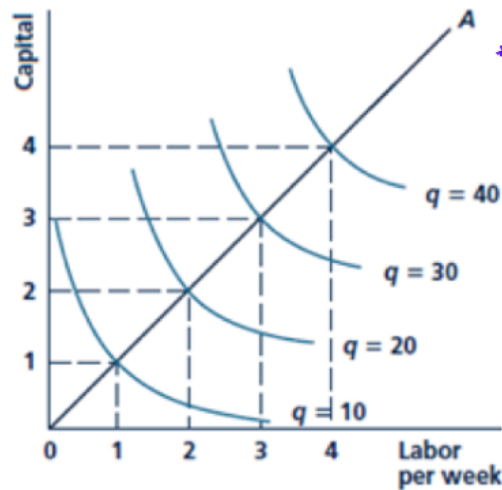
1 Increasing Return to Scale

(c) Increasing returns to scale

* When all input doubled, output more than doubles

* For example: if inputs increase by 5% → output increase by 10

2 Constant Return to Scale

(a) Constant returns to scale

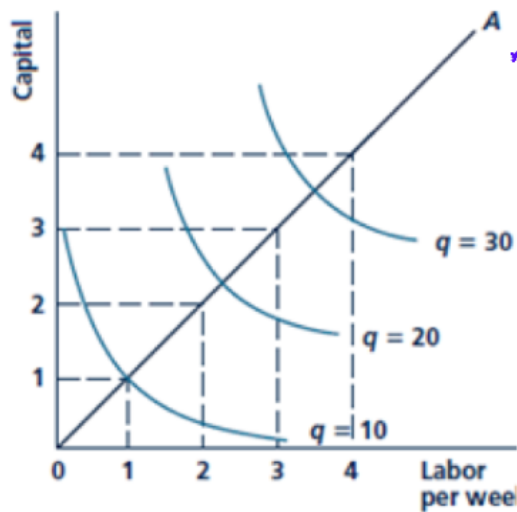* when all inputs doubled, output will be doubled.
  └ if all inputs increase by %5
     → output increase by %5

3 Decreasing Return to Scale

(b) Decreasing returns to scale

* when all input doubled, output less than doubles
  └ if all inputs increase by %5 → output increase by 2%

Chapter 7: Costs

• Basic Concepts of Costs

* Opportunity Cost: Implicit Cost : أشياء ما بضحيت بين ضحيت فيها
* Accounting Cost: Explicit Cost : التكاليف الفعلية
* Economic Cost: Implicit Cost + Explicit Cost

* Labor Costs: wage rate (w): The cost of hiring one worker for one hour
* Capital Costs: Rental rate (v): The cost of hiring one machine for one hour

• Economic Profits and Cost Minimization

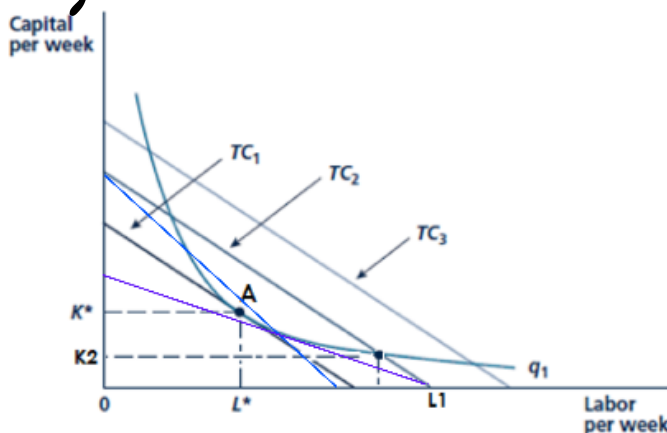* Total Costs: $TC = wL + vK$
* Economic Profits $= TR - TC$
$$= P*q - wL - vK$$

• The Isocost line

↳ Graph showing all possible combinations of labor and capital that can be purchased for a given total cost

* The Isocost line has a slope of $\dfrac{\Delta K}{\Delta L} = \dfrac{-w}{v}$

• Choosing Inputs

* W ↑   Cost ↓
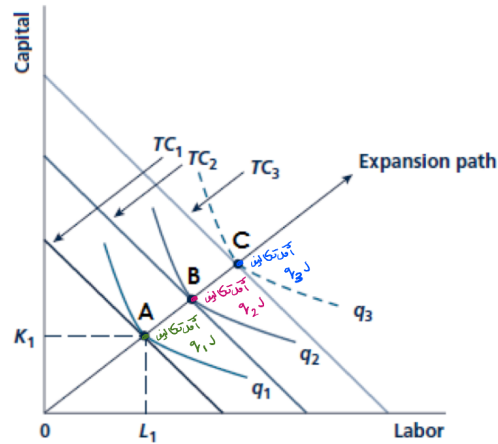   Steeper

* V ↑   TC ↓

* To min Cost: $\dfrac{MPL}{MPK} = \dfrac{w}{v}$

* If $\dfrac{MPL}{w} > \dfrac{MPK}{v}$: Should employing more labor and less capital

* If $\dfrac{MPL}{w} < \dfrac{MPK}{v}$: Should employing more capital and less labor

• The Firm's Expansion Path

↳ Set of cost-minimizing input combinations (The lowest-cost to each output)
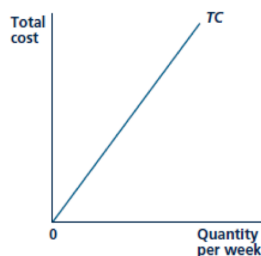

• Input Substitution with an input price changes

* When the expenditure on all inputs increase, the Slope of Isocost line does not Change because the prices of the inputs have not Changed, but the intercept will increase (isocost line Shift to the right)
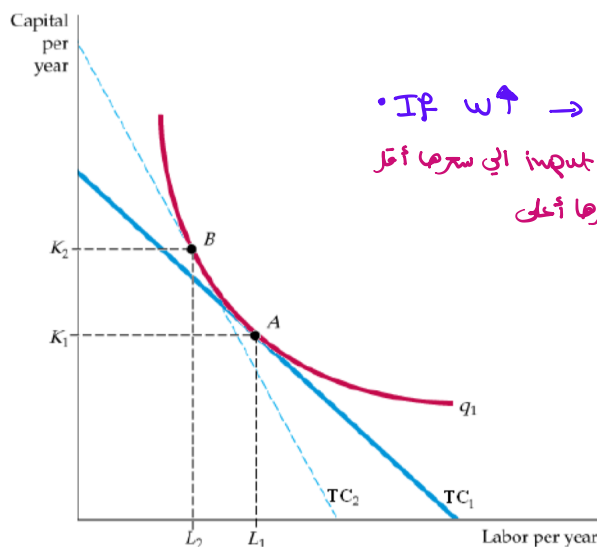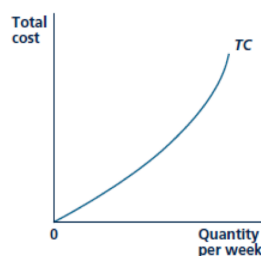

• If w↑ → TC↑ بعد فترة
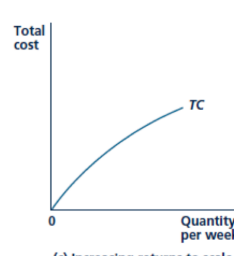• يعتمد أكثر عال input الي سعرها أقل
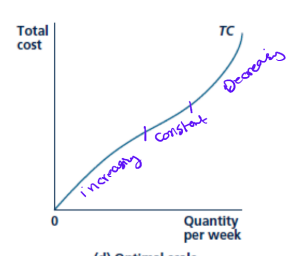وال output الي سعرها أعلى

• Cost Curves

(a) Constant returns to scale
(b) Decreasing returns to scale
(c) Increasing returns to scale
(d) Optimal scale

- بيرجع الى النقطة

* Average Costs (AC) = $\frac{TC}{q}$ (cost per unit)

* Marginal Cost (MC) = $\frac{\Delta TC}{\Delta q}$ = $\frac{dTC}{dq}$ (slope of TC)

• The Relationship Between the Short Run and the Long Run Cost

*The Short Run $\longrightarrow$ inputs are fixed
*The long Run $\longrightarrow$ inputs are Variable

* Labor is the only input the firm can vary

* Short Run Total Cost (STc) = wL + vK₁

$$STC = wL + vK_1$$

• Fixed Cost and Variable Cost

*TC = FC + VC $\longrightarrow$ Cost that Varies as output Varies
  $\hookrightarrow$ it must be paid even if there is no output
  $\hookrightarrow$ The only way that a firm can eliminate its Fixed Costs is by Shutting down

* AFC = $\frac{FC}{q}$
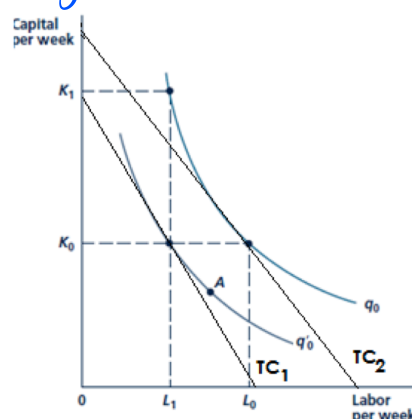* AVC = $\frac{VC}{q}$
* ATC = AFC + AVC

• Shifts in Cost Curves

① Changes in Input Prices

increase in Input price $\longrightarrow$ increase total cost $\longrightarrow$ Shift Cost curves to the right

decrease in Input price $\longrightarrow$ decrease total cost $\longrightarrow$ Shift Cost curves to the left

② Technological Innovation

Same level of output with less of all inputs
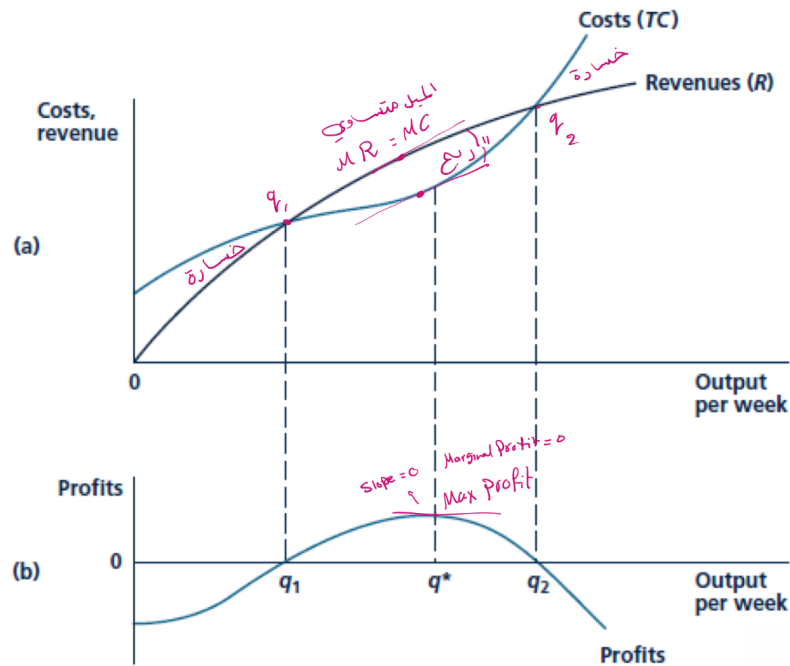$\downarrow$
Shift the costs curve to the left

Chapter 8: Profit Maximization and Supply

- ## Firms' Goals and Profit Maximization

  * Marginalism
    ↳ Marginal Profit: The additional profit from producing one more unit of output

- ## The output Decision

- ## The Marginal Revenue / Marginal Cost Rule

  * If output level where $MR > MC$, the firm can increase its profit by increasing Production

  * If output level where $MR < MC$, the firm can increase its profit by decreasing Production

  * If output level where $MR = MC$, the firm maximizing profit   (Marginal profit = 0)

- ## Marginal Revenue

  * If a firm's output decisions do not affect market price, marginal revenue is equal to price
  * Price taker: A firm or individual whose decisions regarding buying or selling have no effect on the prevailing market price of a good (competitive firm)
  * A price-taking firm: $MR = P$
  * The demand curve is horizontal, because the firm's Sales will have no effect on price

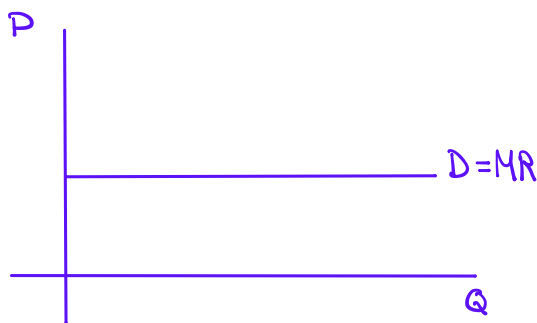- Profit Maximization by a competitive Firm

  - $MC = MR = P$

- Marginal Revenue for a Downward-Sloping Demand Curve
  - A firm that is not a price taker faces a downward sloping demand curve for its product
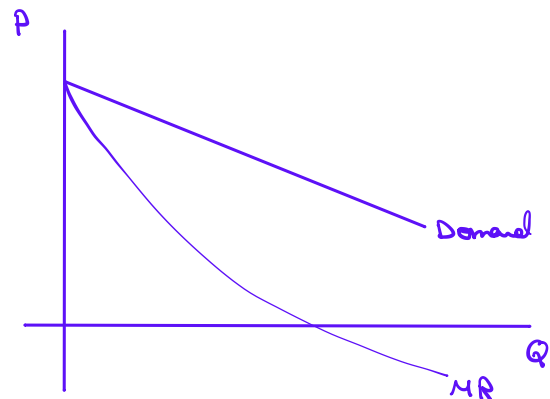 - These firms must reduce their selling price in order to sell more goods, in this case $MR < P$

Competitive Market (Price Taker)

- $MR = P$

- to max profit: $MC = MR = P$
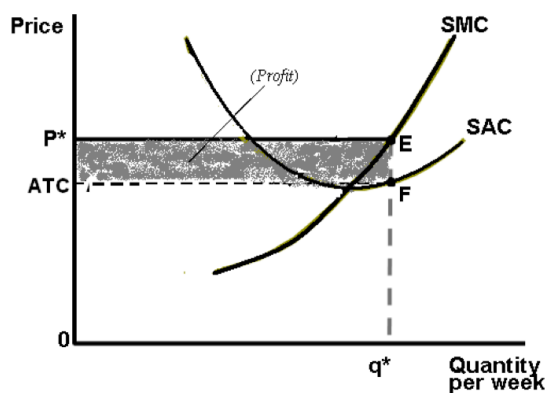 $$\therefore MC = P$$

monopoly (downward sloping demand)

- $MR \neq P \longrightarrow MR < P$

- to max profit $MR = MC$

- Short Run Profit maximization by a competitive Firm : Graphical Analysis

- Profit $= TR - TC$
  - Profit $= q(P - ATC)$

• Marginal Revenue and Price Elasticity

• $e_{Q,P} = \dfrac{\Delta q}{\Delta P}$

• The Relationship between $e_{Q,P}$ and TR:

1. If demand facing the firm is inelastic $(0 < e < 1)$, a rise in price will ↑TR
2. If demand facing the firm is elastic $(e > 1)$, a rise in price will ↓TR
3. If demand facing the firm is unit elastic $(e = 1)$, a rise in price will no change

• The connection between the price elasticity of the demand and marginal revenue:

1. $e > 1$, elastic ⟶ MR is positive $(MR > 0)$
2. $e < 1$, inelastic ⟶ MR is negative $(MR < 0)$
3. $e = 1$, unit elastic ⟶ MR is zero $(MR = 0)$

$$MR = P\left(1 + \frac{1}{e}\right)$$

*If demand is infinitely elastic $(e = \infty)$, MR will equal the price

• Marginal Revenue Curve

↳ in the case of a downward-sloping curve, the MR curve will lie down the demand curve because, at any level of output, MR is less than price

Price

P_1

Demand (average revenue)

0   q_1 Quantity per week

Marginal revenue
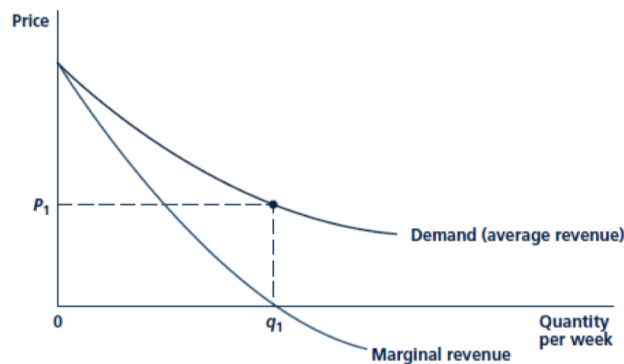
• When Should the Firm Shutdown?

• The Shutdown Decision
↳ The firm will Produce when: $TR > SVC \xrightarrow{\div q} \dfrac{P*q}{q} > \dfrac{SVC}{q}$

$\boxed{P > SAVC}$

- The Firm will Shutdown When:
  - TR < SVC
  - P < SAVc

- Shutdown Price:
  ↳ is the price below which the firm will choose to produce no output in the Short-run

  - The firm will still produce if P < SAc as long as it can cover its fixed costs. However, if price is less than the Shutdown price, the firm will have smaller losses if it shutsdown
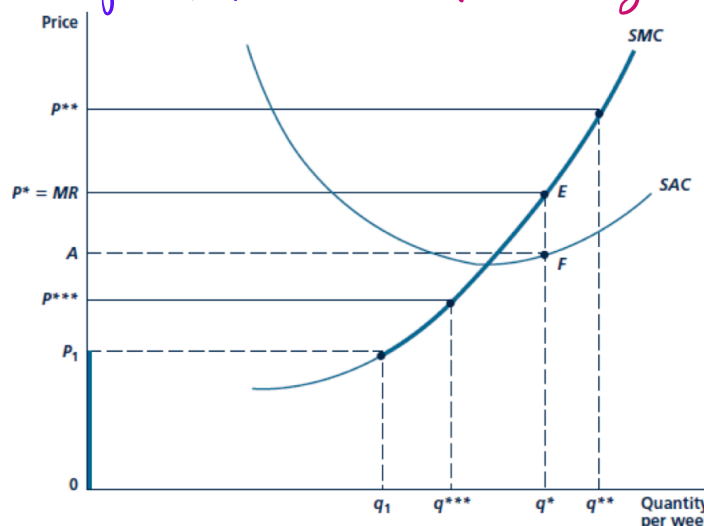
  - Shutdown Price = min of AVC

  - Shutdown Price occurs when MC = AVc
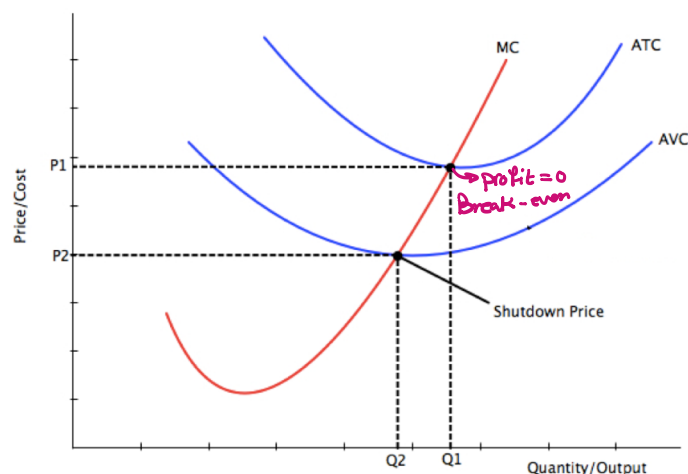
- The Firm's Short-Run Supply Curve
  ↳ The firm's supply curve is the portion of the MC curve for which MC is greater than AVC (price-taking firm)

A competitive firm has the following short run cost function: TC = q^3 - $8q^2$+ 30q+5.

a. At what range of prices will the firm supply zero of output?

Competitive firms will shut down (supply zero output) if price is below average variable cost. The firm will shut down when P< min AVC

At shut down price : MC = AVC

VC = q^3 - $8q^2$+ 30q   →   AVC = $\frac{VC}{q}$ = q^2 - 8q+ 30

MC = $\frac{\partial TC}{\partial q}$ = $3q^2$ - 16q + 30

MC = AVC   → $3q^2$ - 16q + 30 = q^2 - 8q+ 30   → $2q^2$ - 8q = 0   → q - 4 = 0 → q = 4

AVC = q^2 - 8q+ 30 = $(4)^2$ - 8(4) + 30 = 14

the firm will shut down and supply zero of output when $p \leq 14$

b. What is the short run supply curve?

Firm's short-run supply curve is the positively sloped portion of the short-run marginal cost curve above the average variable cost curve.

VC = q^3 - $8q^2$+ 30q ⇨   AVC = $\frac{VC}{q}$ = q^2 - 8q+ 30

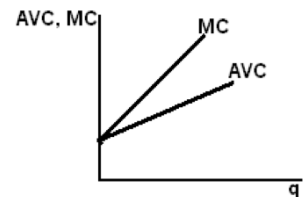MC = $3q^2$ - 16q + 30

Supply curve: P = MC ⇨   P = $3q^2$ - 16q + 30

c. At what price would the firm supply exactly 6 units of output?

 Supply curve: P = $3q^2$ - 16q + 30

P = $3(6)^2$ - 16(6) + 30 = 3x36 - 16x6 + 30 = 108 - 96 + 30 = 42

Chapter 9: Perfect Compitition in the Single Market

- **Timing of a Supply Response**

  - **Supply response:** The Change in quantity of output supplied in response to a change in demand conditions

    - The Very Short Run:
      1. no Supply response
      2. quantity supplied is fixed
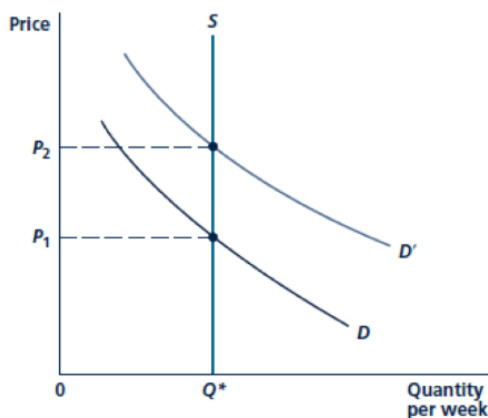
    - The Short Run:
      1. may Change the quantity
      2. no new firms Can enter the market

    - The Long Run:
      1. Can Change the quantity
      2. new firms may enter the market
      3. Very flexible supply response

- **Pricing in the Very Short Run**

  - يعني عدد ساعات العمل ضمن يوم انتاجي

 - المنتج ما بقدر يغير أي جزء من الخطة الانتاجية

  - The Supply Curve is Vertical
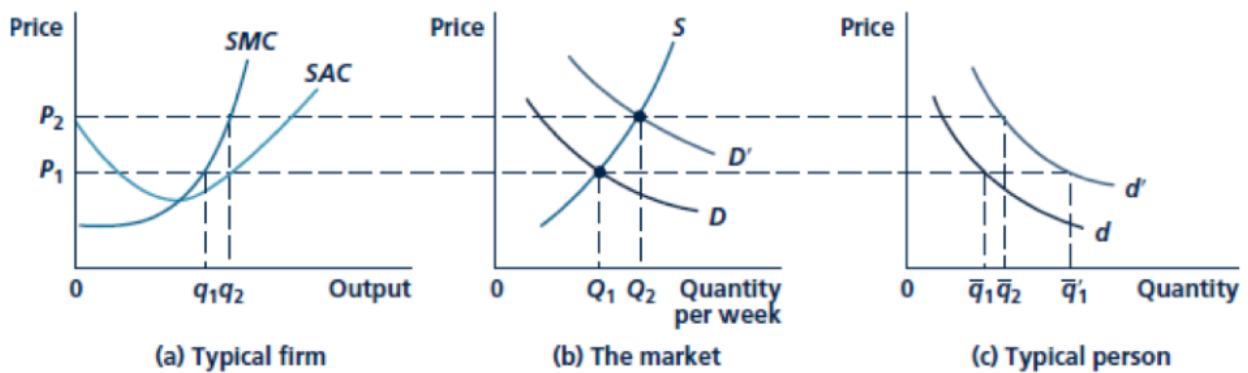
- **Short - Run Supply**

  - The number of firms in an industry is fixed, each firm act as a price taker

  - The firm's Short-run Supply Curve is Simply the positively Sloped Section of its Short-run marginal Cost Curve above the Shutdown price.

- Construction of a Short-Run Supple Curve

- Short-Run market Supply Curve: The relationship between market price and quantity supplied of a good in the short run = Sum of individual supply quantity

(a) Firm A   (b) Firm B   (c) The market
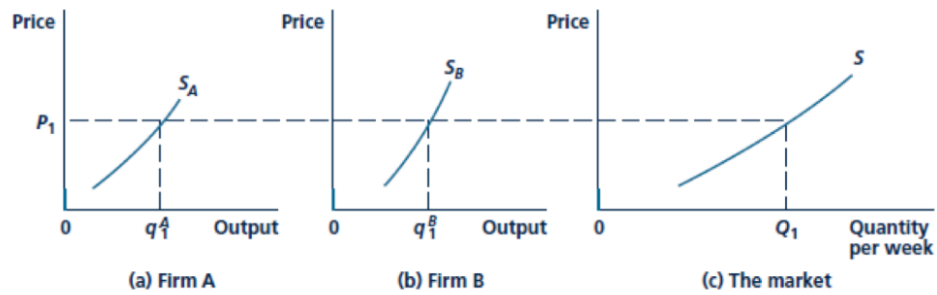
- Effect of an Increase in Market Demand

(a) Typical firm   (b) The market   (c) Typical person

- increased its profits
- increased production

- Supply-demand balance is reestablished

- The demand curve shifts outward.

- The entire market demand curve shifts

- Short-Run Supply Elasticity

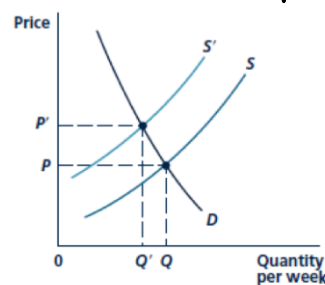- $E_s = \dfrac{dQ_s}{dP} * \dfrac{P}{Q}$

$E_s > 1$, Supply is elastic
$E_s < 1$, Supply is inelastic
$E_s = 1$, Supply is unit elastic

- Shifts in Supply Curves and the Importance of the Shape of the Demand Curve

- The shift inward causes price to increase only slightly whereas quantity contracts sharply → elastic shape

(a) Elastic demand   (b) Inelastic demand
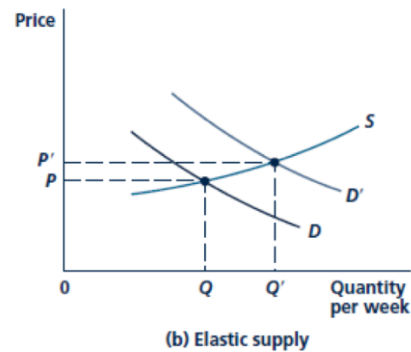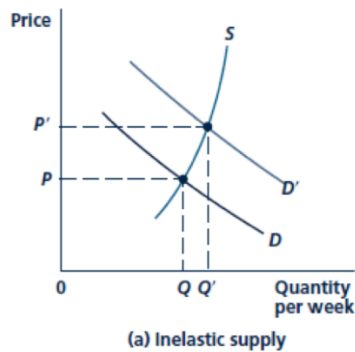
- Price increases substantially with only a slight decrease in Q → inelastic shape

• Shifts in Demand Curves and the Importance of the Shape of the Supply Curve

• A shift in demand Causes price to increase greatly with only a small increase in Q → supply is inelastic

(a) Inelastic supply — Price vs Quantity per week, with curves S, D, D', points P, P' and quantities Q, Q'

(b) Elastic supply — Price vs Quantity per week, with curves S, D, D', points P, P' and quantities Q, Q'

• Price rises only Slightly in response to a demand Shift → supply is elastic

• The Long-Run

- Firms leave a Market when Profits are negative

- If profits are positive, the entry of new firms Causes the Short run market Supply curve to Shift outward

- The equilibrium long-run position requires every firm to earn exactly Zero economic Profits

- The firms in a perfectly competitive industry may earn either positive or negative profits in the Short-Run, in the long-run only Zero profits prevail

- **A long run competitive equilibrium occurs when three conditions hold:**

  1) All firms in the industry are maximizing profit (P = MC)

  2) No firms have an incentive either to enter or exit the industry because all firms are earning zero economic profit (P = ATC)

  3) In the long-run equilibrium: MC = ATC

- $P = MC = AC$

Kim's company makes dachshund refrigerator magnets. The total cost function is $TC = 9 + 3q + q^2$, where q=packets of magnets. $MC = 3 + 2q$. The market price is $11.

a. How many packets will she supply in the short run?

Short run supply curve = MC curve ⇨ S : P = 3 + 2q

P = 3 + 2q ⇨ 11 = 3 + 2q ⇨ 2q = 8 ⇨ q = 4 packets

b. How much profit will she earn?

Profit = TR - TC = Pq - TC = 11q - 9 - 3q − q² = 8q −q² - 9

Profit = 8(4) - (4)² − 9 = 32 - 16 - 9 = 32 - 25 = $7

c. What is Kim's shut-down point?

Shut down price = when AVC = MC

VC = 3q + q² ⇨ AVC = 3 + q   MC = 3 + 2q

3 + q = 3 + 2q ⇨ q = 0

AVC = 3 + 0 = 3   →   shut down price = $3.

d. Is the price likely to stay at $11 in the long run? What will be the price in the long run equilibrium if this is a constant-cost market?

In long runs equilibrium: MC = ATC ⇨ $3 + 2q = \frac{9}{q} + 3 + q$ ⇨ $q = \frac{9}{q}$ ⇨ q² = 9 ⇨ q = 3

From supply curve: P = 3 + 2q ⇨ P = 3 + 2(3) ⇨ P = $9

In the long run the price decrease to $9.

Chapter 10: Monopoly

- **Monopoly**
  - Single producer
  - Blocked Entry
  - No Close Substitute
  - Price Maker

- **Causes of Monopoly**
 - Technical Barriers to Entry
    - Relatively large-scale firms are more efficient than small ones
    - Entry by other firms is difficult because any new firm must produce at low levels of output and therefore at high average costs
    - Barrier to entry arises naturally as a result of the technology of production
      - ↳ natural monopoly
  - Legal Barriers to Entry
    - Legal Protection provided by a patent

- **Monopoly Demand**
  - Its demand Curve is the market demand Curve
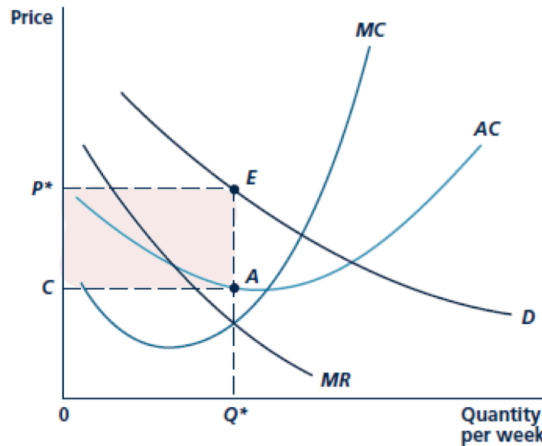 - Demand is not perfectly elastic

Pure Monopoly Demand Curve
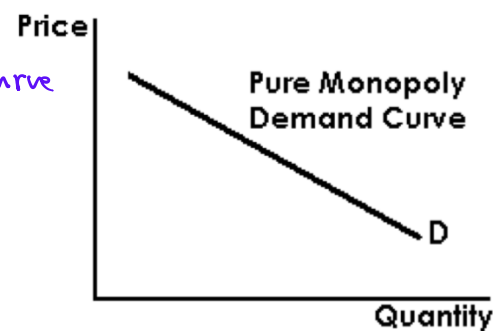
- **Average Revenue and Marginal Revenue**
  - $TR = P * q$
  - $AR = P$
  - $MR = \dfrac{\Delta TR}{\Delta q} = \dfrac{dTR}{dQ}$
  - $MR \neq P$, $MR < P$

• Profit Maximization

- To Maximize profits : MR = MC

- The demand curve is down-ward sloping so MR is less than the price

- A monopoly will produce an output level in which Price > MC
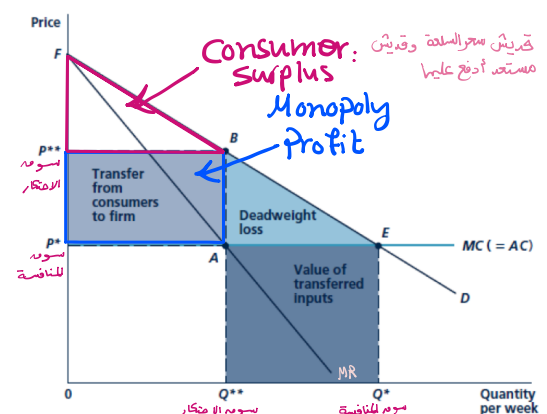

* Profit = area P^*EAC

• Monopoly Supply Curve

- The monopolist equates MR and MC to determine output

- The monopolist MR < P , because the monopolist does not equat MC and Price

- There is no Single, unique price associated with each output level that maximize profit, and So there is no Supply curve for the pure monopoly

• What's wrong with Monopoly?

Competitive Industry	Monopoly
• more output	• less output ←
• lower price	• Higher price ←
• Consumer Surplus area: FEP^* (larger)	• Consumer Surplus area: $P^{**}BF$ (smaller)
• MC = AC = P	• MR = MC
• Deadweight loss = Zero	• Deadweight loss = area ABE

Because

Profit = area $P^{**}BAP^*$