

Linear Programming (L .P)

_____ -1

_____ -2

-

-

-

()

-

Properties of Linear Programming

_____ -3

-1

-2

-3

Limitations of L.P **-5**

:
-1

Uncertainty -2

-3

-6

Formulation of Linear Programming Problems

Product

(.. ..) . Mixed
)

(1)

:

▪
▪

.()

(1)

15	5	3	
10	2	5	
2	3	5	

= x1

= x2

= Z

. X₂ X₁

$$\text{Maxi } Z = 5X_1 + 3X_2$$

$$5X_1 + 5X_2 \leq 15$$

$$3X_1 + 5X_2 \leq 15$$

$$X_1, X_2 \geq 0$$

Standard Form of The L.P Model**-7**

$$\begin{array}{l}
 \vdots \\
 \text{: Objective Function} \\
 \text{Maxi } Z = C_1X_1 + C_2X_2 + \dots + C_nX_n \\
 \vdots \\
 a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n \leq b_1 \\
 a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n \leq b_2 \\
 a_{31}X_1 + a_{32}X_2 + \dots + a_{3n}X_n \leq b_3 \\
 \vdots \\
 \vdots \\
 \vdots \\
 a_{m1}X_1 + a_{m2}X_2 + \dots + a_{mn}X_n \leq b_m \\
 \vdots \\
 X_1, X_2, \dots, X_n \geq 0
 \end{array}$$

$$\begin{array}{l}
 \vdots \\
 \text{: Objective Function} \\
 \text{Mini } Z = C_1X_1 + C_2X_2 + \dots + C_nX_n \\
 \vdots \\
 a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n \geq b_1 \\
 a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n \geq b_2 \\
 a_{31}X_1 + a_{32}X_2 + \dots + a_{3n}X_n \geq b_3 \\
 \vdots \\
 \vdots \\
 \vdots \\
 a_{m1}X_1 + a_{m2}X_2 + \dots + a_{mn}X_n \leq b_m \\
 \vdots \\
 X_1, X_2, \dots, X_n \geq 0
 \end{array}$$

Solution of (L.P)

- 7

Algebraic Method	-1
The Graphical Method	-2
	-3

The Graphical Method -8حالة تعظيم الارباح

(1)

$$\text{Maxi } Z = 5X_1 + 3X_2$$

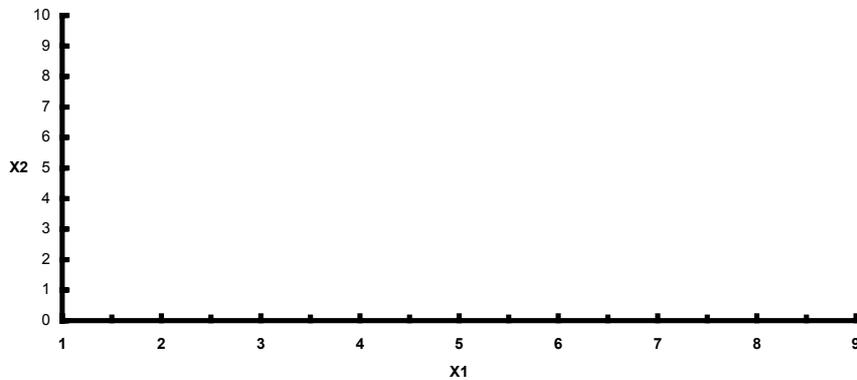
S. to :

$$5X_1 + 5X_2 \leq 15$$

$$3X_1 + 5X_2 \leq 15$$

$$X_1, X_2 \geq 0$$

رسم محاور القيود



شكل (1)

(1)

 $\therefore (X_1 = 0)$

$$3(0) + 5X_2 = 15$$

$$5X_2 = 15$$

$$X_2 = 3$$

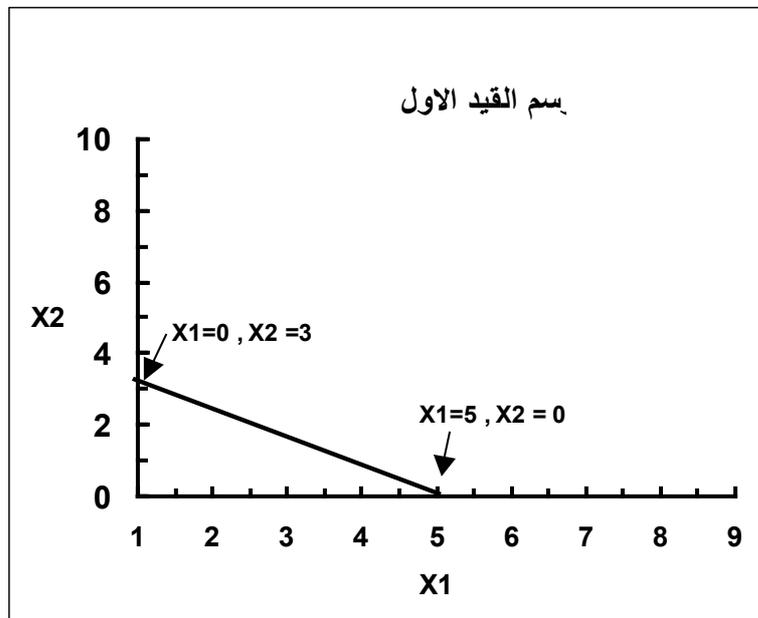
 $\therefore (X_2 = 0)$

$$3X_1 + 5(0) = 15$$

$$3X_1 = 15$$

$$X_1 = 5$$

(2)

 $(x_1 = 0)$

$$5(0) + 2X_2 = 10$$

$$2X_2 = 10$$

$$X_2 = 5$$

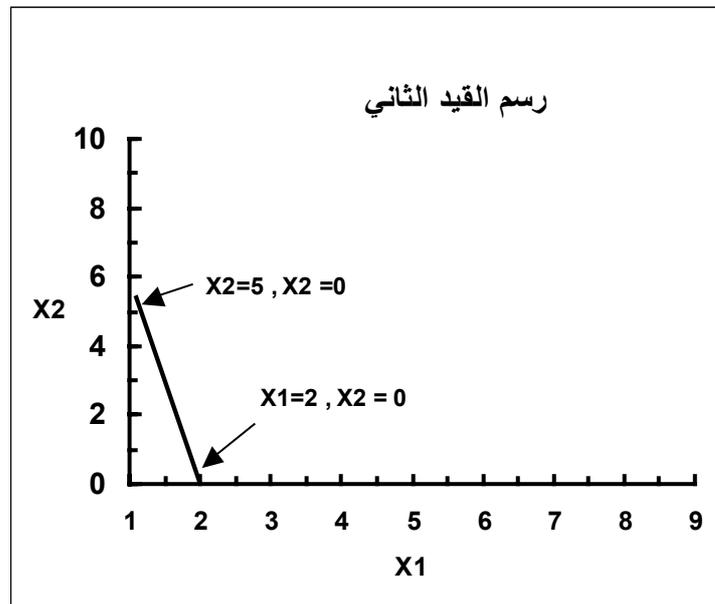
 $(X_2 = 0)$

$$5(0) + 2(0) = 10$$

$$5X_1 = 10$$

$$X_1=2$$

(3)

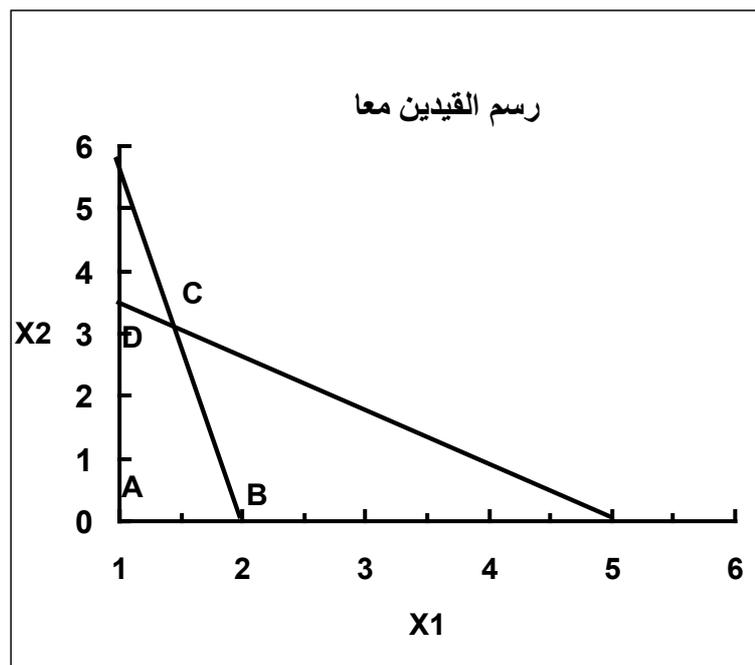


(3)

-3

()

(4)



شكل (4)

(A,B,C,D)
 Area of Feasible) (Region

() .
 ∴

The Corner Points

A,B,C,D

(4)

	X_1, X_2
	:
A	$X_2=0 \quad X_1=0$
B	$X_2 =0 \quad X_1=2$
D	$X_2=3 \quad X_1=0$
	X_1, X_2
	:

(3) (5)

$$5(3X_1 + 5X_2) = (15) \quad \dots\dots\dots(1)$$

$$3(5X_1 + 2X_2) = (10) \quad \dots\dots\dots(2)$$

$$19X_2 = 45$$

$$X_2 = 2.37$$

:

(1) X_2

$$3X_1 + 5(2.37) = 15$$

$$15 - 11.85 = 3X_1$$

$$X_1 = 1.05$$

			: X1 ,X2
	X ₁	X ₂	Z= 5X ₁ + 3X ₂
A	0	0	Z = 5(0) + 3(0) = 0
B	2	0	Z= 5 (2) + 3(0) = 10
C	1.05	2.37	Z= 5(1.05) + 3(2.37) = 12.37
D	0	3	Z= 5(0) + 3(3) = 9

(12.37)

∴ _____

-1

-2

-3

-4

والحمد لله رب العالمين
مع تحيات أخوكم : الشمري
ادعوا لنا