FECHA: 5/4/056

HOJA: nº1

Alfano Franco

Parcial Investigación Operativa

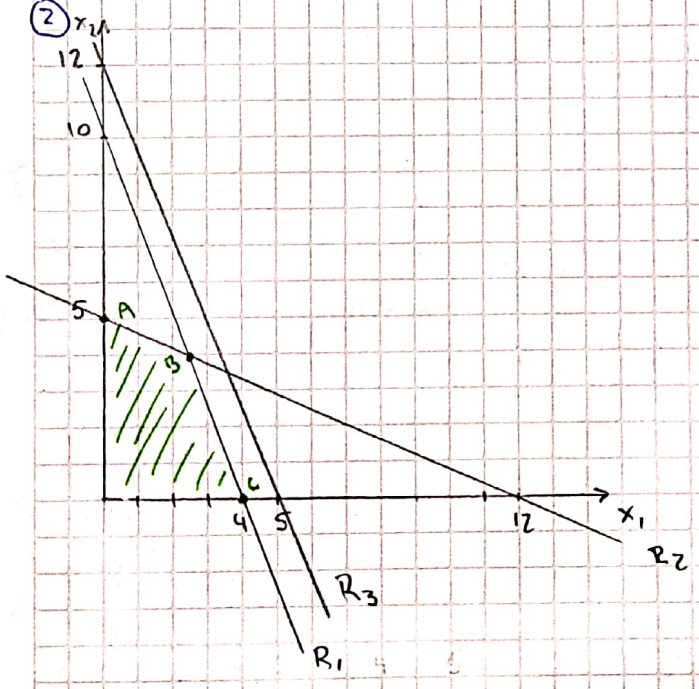
$Z = 6x_1 + 10x_2$

	x_1	x_2	Disponibilidad
Armado	20 hs	8 hs	80 hs ✓
Prueba	10 hs	24 hs	120 hs ✓
Embalaje	12 h	5 hs	60 hs ✓

(1)

$$\begin{cases} 20x_1 + 8x_2 \leq 80 & [x_1 = 4 \wedge x_2 = 10] \quad R_1 \\ 10x_1 + 24x_2 \leq 120 & [x_1 = 12 \wedge x_2 = 5] \quad R_2 \\ 12x_1 + 5x_2 \leq 60 & [x_1 = 5 \wedge x_2 = 12] \quad R_3 \end{cases}$$

(2)



(A) $x_1 = 0 \wedge x_2 = 5$

$Z = 6.0 + 10.5$

$Z = 50$ ✓

(C) $x_1 = 4 \wedge x_2 = 0$

$Z = 24$ ✓

(B) $R_1 \cap R_2$

$$x_1 = \frac{\begin{vmatrix} 80 & 8 \\ 120 & 24 \end{vmatrix}}{\begin{vmatrix} 20 & 8 \\ 10 & 24 \end{vmatrix}} = \frac{12}{5}$$

$$x_2 = \frac{\begin{vmatrix} 20 & 80 \\ 10 & 120 \end{vmatrix}}{\begin{vmatrix} 20 & 8 \\ 10 & 24 \end{vmatrix}} = 4$$

$Z = 54,4$ ✓

Conclusión: Se genera la mayor ganancia Produciendo 12/5 de x_1 y 4 de x_2, generando un beneficio de 54,4

NOTA:

(3)

$$\begin{cases} 20x_1 + 8x_2 + S_1 = 80 \\ 10x_1 + 24x_2 + S_2 = 120 \\ 12x_1 + 5x_2 + S_3 = 60 \end{cases}$$

3 Alfano

Ck	Xk	B	A1	A2	A3	A4	A5
	Cj		6	10	0	0	0
0	S_1	80	20	8	1	0	0
0	S_2	120	10	24	0	1	0
0	S_3	60	12	5	0	0	1
Zj		0	0	0	0	0	0
Cj - Zj			6	10	0	0	0
0	S_1	40	50/3	0	1	-1/3	0
10	x_2	5	5/12	1	0	1/24	0
0	S_3	35	119/12	0	0	-5/24	1
Zj		50	25/6	10	0	5/12	0
Cj - Zj			11/6	0	0	-5/12	0

80/8 = 10

→ 120/24 = 5

60/5 = 12

→ 40/50/3 = 12/5 [2,4]

5/5/12 = 12

35/119/12 = 60/17 [3,53]

(4)

Ck	Xk	B	A1	A2	A3	A4	A5
6 *	x_1	12/5	1	0	3/50	-1/50	0
10 *	x_2	4	0	1	-1/40	1/20	0
0 –	S_3	56/5	0	0	-119/200	-1/100	1
Zj		54,4	6	10	11/100	19/50	0
Cj - Zj			0	0	-11/100	-19/50	0

ocupados / sobrante

La ganancia máxima es 54,4 cuando se produce 12/5 x_1 y 4 x_2; El sobrante es S_3 y sobra 56/5 (5), los recursos saturados son * y los sobrantes –

(6)

Ck	Yk	Bk	A1	A2	A3	A4	A5
	Bj		80	120	60	0	0
120	y_2	19/50	0	1	1/100	-1/20	1/50
80	y_1	11/100	1	0	119/200	1/40	-3/50
Zj		54,4	80	120	244/5	-4	-12/5
Bj - Zj			0	0	56/5	4	12/5

solo no son los recursos saturados, son la cantidad de x_1 y x_2 que se fabrican

los saturados son S_1 y S_2

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FECHA:

NOTA:

⑦ Simplex:

$C_3 - Z_3 \leq 0$

$C_3 - |\Delta c_3| \leq C_3 \leq C_3 + |\Delta c_3| \Rightarrow \boxed{\frac{25}{6} \leq C_1 \leq 25}$ ✓

4,16 ✓

$\Delta c_3 = \frac{-11/100}{3/50} = -11/6\ (-1,83)$

$\Delta c_4 = 19$

Dual:

$B_1 - |\Delta B_1| \leq B_1 \leq B_1 + |\Delta B_1|$

$\boxed{40 \leq B_1 \leq 240}$ ✓

$\Delta B_3 = 1120$

$\Delta B_4 = -80$

$\Delta B_5 = 120$