

Primer Examen Cordo

Programación Lineal

Problema #1

Maximizar: $Z = 8x_1 + 12x_2$

Sujeto a: $6x_1 + 3x_2 \leq 180$

$5x_1 + 7x_2 \leq 210$

$2x_1 + 6x_2 \leq 120$

$3x_2 \leq 10$

$x_1, x_2 \geq 0$

Simplex; Solución \rightarrow Matriz Inicial Iteración 1:

Base	x_1	x_2	s_1	s_2	s_3	s_4	R
s_1	6	0	1	0	0	-1	170
s_2	5	0	0	1	0	-7/3	560/3
s_3	2	0	0	0	1	-2	100
x_2	0	1	0	0	0	1/3	10/3
Z	-8	0	0	0	0	4	40

Gl pivote

$e = 6$

Iteración 2:

Base	x_1	x_2	s_1	s_2	s_3	s_4	R
s_1	1	0	1/6	0	0	-1/6	85/3
s_2	0	0	-5/6	1	0	-3/2	45
s_3	0	0	-1/3	0	1	-5/3	130/3
x_2	0	1	0	0	0	1/3	10/3
Z	0	0	4/3	0	0	8/3	800/3

La Solución óptima es: $Z = \frac{800}{3}$

$x_1 = \frac{85}{3}$; $x_2 = \frac{10}{3}$; $s_1 = 0$; $s_2 = 45$; $s_3 = \frac{130}{3}$; $s_4 = 0$

Problema # 2

Maximize

$$Z = 2x_1 + 3x_2$$

Subject to:

$$1) 3x_1 + 2x_2 \leq 60$$

$$2) x_1 + 3x_2 \geq 30$$

$$3) x_1 \leq 15$$

$$4) x_1, x_2 \geq 0$$

Para \rightarrow Subject to:

$$3x_1 + 2x_2 + 1s_1 + 0s_2 + 0s_3 + 0A_1 = 60$$

$$0x_1 + 3x_2 + 0s_1 - 1s_2 + 0s_3 + 1A_1 = 30$$

$$1x_1 + 0x_2 + 0s_1 - 0s_2 + 1s_3 + 0A_1 = 15$$

$$x_1, x_2, s_1, s_2, s_3, A_1 \geq 0$$

Solution: Matrix initial

Base	x_1	x_2	s_1	s_2	s_3	A_1	R
s_1	3	2	1	0	0	0	60
A_1	0	(3)	0	-1	0	1	30
s_3	1	0	0	0	1	0	15
Z	-2	3/1-3	0	-1	0	0	30M

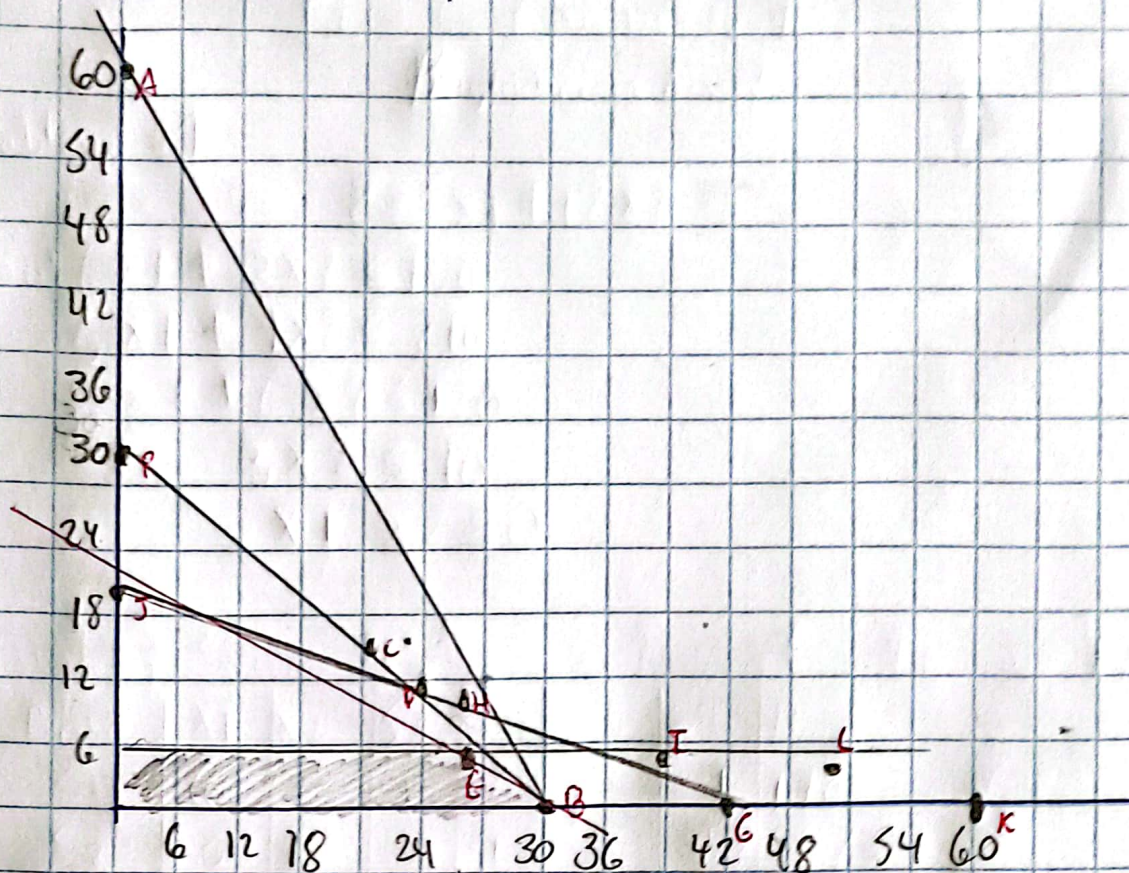
Iteration 1:

Base	x_1	x_2	s_1	s_2	s_3	A_1	R
s_1	3	0	1	2/3	0	-2/3	40
x_2	0	1	0	-1/3	0	1/3	10
s_3	1	0	0	0	1	0	15
Z	-2	0	0	-1	0	-1/3	30

La Solution optimale est $Z = 30$

$$x_1 = 0; x_2 = 10; s_1 = 40; s_2 = 0; s_3 = 15; A_1 = 0$$

Soluciona Problema 1 por medio de Método Gráfico



Punto	Coordenada X	Coordenada Y	
O	0	0	0
A	30	60	720
B	30	0	240
C	23.333333	13.333333	346.666666667
D	20	12	336
E	26.333333	3.333333	286.666666667
F	30	30	360
G	42	0	336
H	32.25	11.25	345
I	37.333333	3.333333	338.666666667
J	60	20	240
K	60	0	480
L	60	33.333333	440
M	0	3.333333	40