Tarea 4opti - Ejercicios de optimización

Optimización (Universidad Autónoma de Nuevo León)

UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

FACULTAD DE INGENIERÍA MECÁNICA Y ELÉCTRICA

OPTIMIZACIÓN.
TAREA 04.

Catedrático: Ing. Cristina Sari Villegas Guzmán.
Alumna: Mariana Alessandra Espinosa Flores.
Carrera: IAS. Matrícula:1975291.

Semestre: ENERO-JUNIO 2022.

13 de Mayo del 2022, San Nicolás de los Garza, Nuevo León.

Ejercicio 2.

$Z_{max} = 60x_1 + 50x_2$

$x_1 + 2x_2 <= 40$

$2x_1 + 3x_2 >= 6$

$2x_1 + x_2 <= 40$

$3x_1 + 2x_2 >= 6$

$Z_{max} = 60x_1 + 50x_2 + 0s_2 + 0s_3 + 0s_1 - MA_1 - MA_2$

Sale

		60 x_1	50 x_2	0 S_2	0 S_4	0 S_1	-M A_1	0 S_3	-M A_2
$0s_1$	40	1	2	0	0	1	0	0	0
$-MA_1$	6	2	3	-1	0	0	1	0	0
$0s_3$	40	2	1	0	0	0	0	1	0
$-MA_2$	6	3	2	0	-1	0	0	0	1 (1/3)
$-12M+0$		-5M -60	-5M -50	M	M	0	0	0	0

Pivote → Entra

$-5(100) - 60 = -560$ $-5(100) - 50 = -550$

↑ valor más negativo

* No es optima ya que tienen que ser todos positivos y/o ceros.

Sale

		60 x_1	50 x_2	0 S_2	0 S_4	0 S_1	-M A_1	0 S_3	-M A_2
$0s_1$	38	0	4/3	0	+1/3	1	0	0	-1/3
$-MA_1$	2	0	5/3	-1	+2/3	0	1	0	-2/3 (3/5)
$0s_3$	36	0	-1/3	0	2/3	0	0	1	-2/3
$60x_1$	2	1	2/3	0	-1/3	0	0	0	1/3
$-2M+120$		0	5/3M -10	M	-2/3M 20	0	0	0	+5/3M +20

Pivote → Entra

$-5/3(100) - 10 = -\frac{550}{3}$ $-2/3(100) - 20 = -\frac{260}{3}$

Nuevos elementos

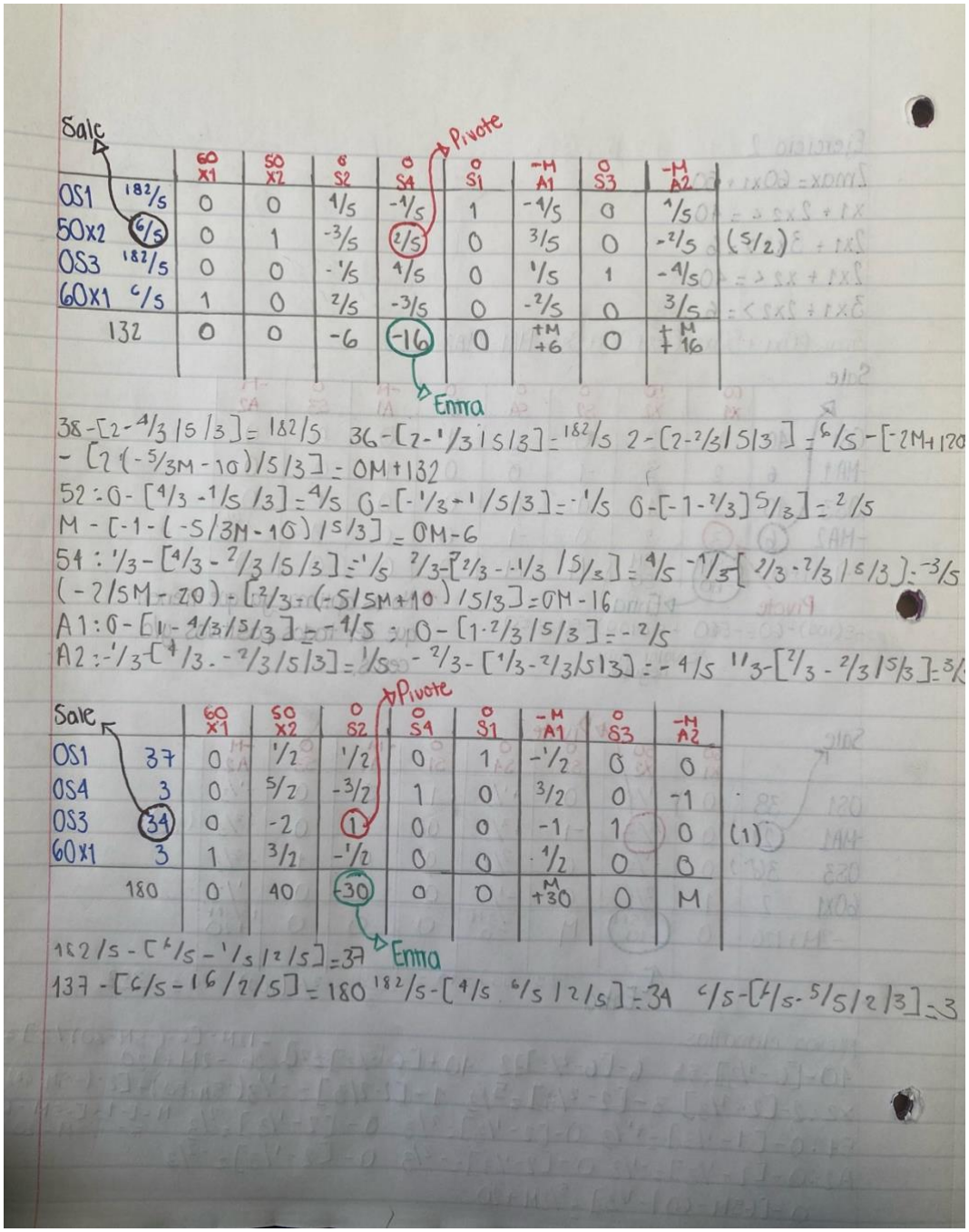
$40 - [6 - 1/3] = 38$ $6 - [6 - 2/3] = 2$ $40 - [6 \cdot 2/3] = 36$ $-12M - [6 \cdot (-5M - 60)/3] = -2M + 120$

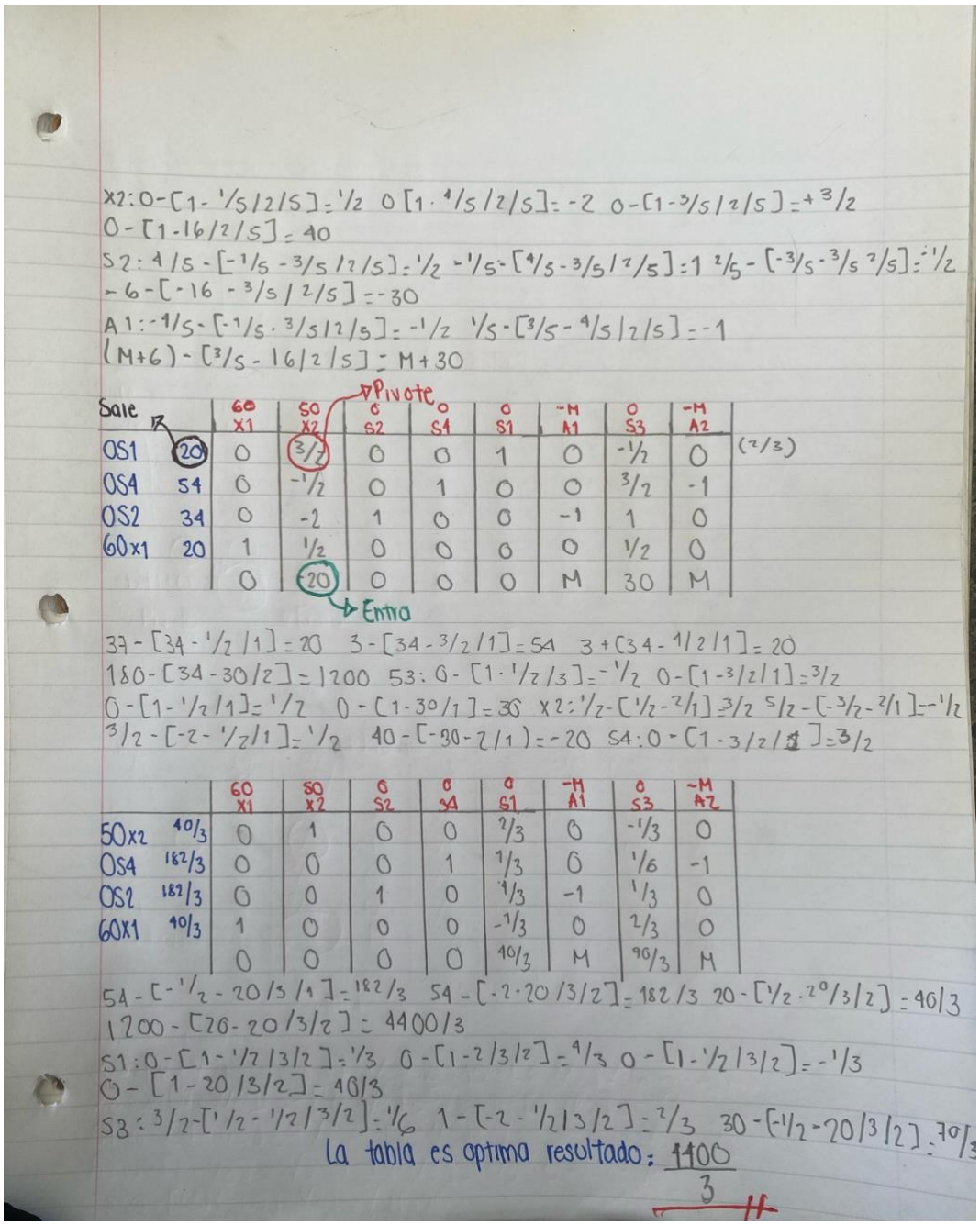
$x_2 : 2 - [2 - 1/3]$ $3 - [2 - 2/3] = 5/3$ $1 - [2 \cdot 2/3] = -1/3$ $(-5A \cdot 50) - [2 \cdot (-5M - 60)]/3$

$S_4 : 0 - [1 - 1/3] = +1/3$ $0 - [2 - 1/3] = 2/3$ $0 - [2 - 1/3] = 2/3$ $M - [-1 \cdot [-5M - 60)/3] = -2/3M - 20$

$A_2 : 0 - [1 - 1/3] = -1/3$ $0 - [2 \cdot 1/3] = -2/3$ $0 - [2 - 1/3] = -2/3$

$0 - [(-5M - 60) - 1/3] = 5/3M + 20$





X2: 0-[1-1/5/2/5]=1/2 0[1·4/5/2/5]=-2 0-[1-3/5/2/5]=+3/2
0-[1-16/2/5]=40
S2: 4/5-[-1/5-3/5/2/5]=1/2 -1/5-[4/5-3/5/2/5]=1 2/5-[-3/5-3/5 2/5]=-1/2
-6-[-16-3/5/2/5]=-30
A1: -4/5-[-1/5·3/5/2/5]=-1/2 1/5-[3/5-4/5/2/5]=-1
(M+6)-[3/5-16/2/5]=M+30

Pivote

Sale		60 X1	50 X2	0 S2	0 S4	0 S1	-M A1	0 S3	-M A2	
OS1	20	0	3/2	0	0	1	0	-1/2	0	(2/3)
OS4	54	0	-1/2	0	1	0	0	3/2	-1	
OS2	34	0	-2	1	0	0	-1	1	0	
60X1	20	1	1/2	0	0	0	0	1/2	0	
		0	20	0	0	0	M	30	M	

Entra

37-[34-1/2/1]=20 3-[34-3/2/1]=54 3+[34-1/2/1]=20
180-[34-30/2]=1200 53: 0-[1·1/2/3]=-1/2 0-[1-3/2/1]=3/2
0-[1-1/2/1]=1/2 0-[1-30/1]=30 X2: 1/2-[1/2-2/1]=3/2 5/2-[-3/2-2/1]=-1/2
3/2-[-2-1/2/1]=1/2 40-[-30-2/1)=-20 S4: 0-[1-3/2/1]=3/2

		60 X1	50 X2	0 S2	0 S4	0 S1	-M A1	0 S3	-M A2
50X2	40/3	0	1	0	0	2/3	0	-1/3	0
OS4	182/3	0	0	0	1	1/3	0	1/6	-1
OS2	182/3	0	0	1	0	1/3	-1	1/3	0
60X1	40/3	1	0	0	0	-1/3	0	2/3	0
		0	0	0	0	40/3	M	90/3	M

S4-[-1/2-20/3/1]=182/3 S4-[-2·20/3/2]=182/3 20-[1/2·20/3/2]=40/3
1200-[720-20/3/2]=4400/3
S1: 0-[1-1/2/3/2]=1/3 0-[1-2/3/2]=4/3 0-[1-1/2/3/2]=-1/3
0-[1-20/3/2]=40/3
S3: 3/2-[1/2-1/2/3/2]=1/6 1-[-2-1/2/3/2]=2/3 30-[-1/2-20/3/2]=70/3

La tabla es optima resultado: 1100/3