Ejemplo

$$Z = a + 2b$$

s.a.

r1: $a + 3b \leq 15$ a+3b+h1=15
r2: $2a + b \leq 12$ 2a+b+h2=12
r3: $a \geq 0$
r4: $b \geq 0$

-

Maximizar

		a	b	h1	h2			
	h1	1	3	1	0	15	5	
	h2	2	1	0	1	12	12	
	Zj	-1	-2	0	0	0		

1/3h1	b	1/3	1	1/3	0	5	15	
-b+h2	h2	1 2/3	0	- 1/3	1	7	4	1/5
2b+Zj	Zj	- 1/3	0	2/3	0	10		

-1/3a+b	b	0	1	2/5	- 1/5	3	3/5
3/5h2	a	1	0	- 1/5	3/5	4	1/5
1/3a+Zj	Zj	0	0	3/5	1/5	11	2/5

a=	4	1/5
b=	3	3/5
h1=	0	
h2=	0	
Zj=	11	2/5

Minimizar

	a	b	h1	h2		
h1	1	3	1	0	15	5
h2	2	1	0	1	12	12
Zj	1	2	0	0	0	

a=	0
b=	0
h1=	15
h2=	12
Zj=	0

1. $Z = a + 3b$

s.a.

r1: $2a + b \leq 50$
r2: $a + 2b \leq 60$
r3: $a \geq 0$
r4: $b \geq 0$

$2a+b+h1=50$
$a+2b+h2=60$

Integrantes
Gonzalez Ordoñez Daniel
Mondragón Zarate Jesús Alejandro
Rojas Alvarado Luis Enrique

==Maximizar==

		a	b	h1	h2		
	h1	2	1	1	0	50	50
	h2	1	2	0	1	60	30
	Zj	-1	-3	0	0	0	

			a	b	h1	h2	
-1b+h1	h1		1.5	0	1	-0.5	20
1/2h2	b		0.5	1	0	0.5	30
3b+Zj	Zj		0.5	0	0	1.5	90

a=	0
b=	30
h1=	20
h2=	0
Zj=	90

$2a+b+h1=50$ 50
$a+2b+h2=60$ 60

==Minimizar==

		a	b	h1	h2		
	h1	2	1	1	0	50	50
	h2	1	2	0	1	60	30
	Zj	1	3	0	0	0	

a=	0
b=	0
h1=	50
h2=	30
Zj=	0

2. $Z = 4x + y$
s.a.
r1: $x + y \geq 8$
r2: $2x + 2y \leq 35$
r3: $x \leq 6$
r4: $x \geq 0$
r5: $y \geq 0$

-x-y+h1=-8
2x+2y+h2=35
x+h3=6

<mark>Maximizar</mark>

		x	y	h1	h2	h3		
	h1	-1	-1	1	0	0	-8	8
	h2	2	2	0	1	0	35	17.5
	h3	1	0	0	0	1	6	6
	Zj	-4	-1	0	0	0	0	0
1x+h1	h1	0	-1	1	0	1	-2	2
-2x+h2	h2	0	2	0	1	-2	23	11.5
	x	1	0	0	0	1	6	#¡DIV/0!
4x+Zj	Zj	0	-1	0	0	4	24	-24
	y	0	1	-1	0	-1	2	-2
-2y+h2	h2	0	0	2	1	0	19	9.5
	x	1	0	0	0	1	6	#¡DIV/0!
1y+Zj	Zj	0	0	-1	0	3	26	-26
1h1+y	y	0	1	0	0.5	-1	11.5	
	h1	0	0	1	0.5	0	9.5	
	x	1	0	0	0	1	6	
1h1+Zj	Zj	0	0	0	0.5	3	35.5	

<mark>Minimizar</mark>

	x	y	h1	h2	h3	
h1	-1	-1	1	0	0	-8
h2	2	2	0	1	0	35
h3	1	0	0	0	1	6
Zj	4	1	0	0	0	0

x=	0
y=	0
h1=	-8
h2=	35
h3=	6
Zj=	0

x=	6
y=	11.5
h1=	9.5
h2=	0
h3=	0
Zj=	35.5

-x-y+h1=-8   -8
2x+2y+h2=35   35
x+h3=6   6

3. $Z = \frac{1}{4}x + \frac{1}{3}y$

s.a.

r1: $2x + 3y \leq 30$ 2x+3y+h1=30
r2: $7x + y \leq 49$ 7x+y+h2=49
r3: $x - y \leq 15$ x-y+h3=15
r4: $x \geq 0$
r5: $y \geq 0$

Maximizar

	x	y	h1	h2	h3		
h1	2	3	1	0	0	30	10
h2	7	1	0	1	0	49	49
h3	1	-1	0	0	1	15	-15
Zj	-0.25	-0.33333333	0	0	0	0	

Minimizar

	x	y	h1	h2	h3	
h1	2	3	1	0	0	30
h2	7	1	0	1	0	49
h3	1	-1	0	0	1	15
Zj	0.25	0.33333333	0	0	0	0

		x	y	h1	h2	h3		
	y	2/3	1	1/3	0	0	10	15
-1y+h2	h2	6 1/3	0	- 1/3	1	0	39	6.15789474
1y+h3	h3	1 2/3	0	1/3	0	1	25	15
1/3y+Zj	Zj	- 1/36	0	1/9	0	0	3 1/3	

		x	y	h1	h2	h3	
	y	0	1	7/19	- 2/19	0	5 17/19
	x	1	0	- 1/19	3/19	0	6 3/19
-5/3x+h3	h3	0	0	8/19	- 5/19	1	14 14/19
1/36x+Zj	Zj	0	0	25/228	1/228	0	3 115/228

Left labels for the third tableau: -2/3x+y

Minimizar solución

x=	0
y=	0
h1=	30
h2=	49
h3=	15
Zj=	0

Maximizar solución

x=	6 3/19
y=	5 17/19
h1=	0
h2=	0
h3=	14 14/19
Zj=	3 115/228

2x+3y+h1=30   30
7x+y+h2=49   49
x-y+h3=15   15

4. $Z = 7m + 2n$

s.a.
r1: $4m + n \leq 16$
r2: $m + 5n \leq 30$
r3: $m \leq n - 12$
r4: $m \geq 0$
r5: $n \geq 0$

4m+n+h1=16
m+5n+h2=30
m-n+h3=-12

	m	n	h1	h2	h3		
h1	4	1	1	0	0	16	4
h2	1	5	0	1	0	30	30
h3	1	-1	0	0	1	-12	-12
Zj	-7	-2	0	0	0	0	

		m	n	h1	h2	h3		
	m	1	1/4	1/4	0	0	4	16
-1m+h2	h2	0	4 3/4	- 1/4	1	0	26	5.47368421
-1m+h3	h3	0	-1 1/4	- 1/4	0	1	-16	12.8
7m+Zj	Zj	0	- 1/4	1 3/4	0	0	28	

		m	n	h1	h2	h3	
-1/4n+m	m	1	0	5/19	- 1/19	0	2 12/19
	n	0	1	- 1/19	4/19	0	5 9/19
5/4n+h3	h3	0	0	- 6/19	5/19	1	-9 3/19
1/4n+Zj	Zj	0	0	1 14/19	1/19	0	29 7/19

m=	2 12/19
n=	5 9/19
h1=	0
h2=	0
h3=	-9 3/19
Zj=	29 7/19

4m+n+h1=16   16
m+5n+h2=30   30
m-n+h3=-12   -12

	m	n	h1	h2	h3	
h1	4	1	1	0	0	16
h2	1	5	0	1	0	30
h3	1	-1	0	0	1	-12
Zj	7	2	0	0	0	0

m=	0
n=	0
h1=	16
h2=	30
h3=	-12
Zj=	0

5. $Z = 3x - 5y$

s.a.
r1: $3x + 2y \leq 25$
r2: $x \leq 5$
r3: $4x \leq 36 - 3y$
r4: $x \geq -4$
r5: $y \geq 2$

3x+2y+h1=25
x+h2=5
4x+3y+h3=36
-4x+h4=4
-y+h5=-2

Maximizar

		x	y	h1	h2	h3	h4	h5		
	h1	3	2	1	0	0	0	0	25	8.33333333
	h2	1	0	0	1	0	0	0	5	5
	h3	4	3	0	0	1	0	0	36	9
	h4	-4	0	0	0	0	1	0	4	-1
	h5	0	-1	0	0	0	0	1	-2	#¡DIV/0!
	Zj	-3	5	0	0	0	0	0	0	
-3x+h1	h1	0	2	1	-3	0	0	0	10	
	x	1	0	0	1	0	0	0	5	
-4x+h3	h3	0	3	0	-4	1	0	0	16	
4x+h4	h4	0	0	0	4	0	1	0	24	
	h5	0	-1	0	0	0	0	1	-2	
3x+Zj	Zj	0	5	0	3	0	0	0	15	

x	5
y	0
h1	10
h2	0
h3	16
h4	24
h5	-2
Zj	15

3x+2y+h1=25	25
x+h2=5	5
4x+3y+h3=36	36
-4x+h4=4	4
-y+h5=-2	-2

Minimizar

		x	y	h1	h2	h3	h4	h5		
	h1	3	2	1	0	0	0	0	25	12.5
	h2	1	0	0	1	0	0	0	5	#¡DIV/0!
	h3	4	3	0	0	1	0	0	36	12
	h4	-4	0	0	0	0	1	0	4	#¡DIV/0!
	h5	0	-1	0	0	0	0	1	-2	2
	Zj	3	-5	0	0	0	0	0	0	
-2y+h1	h1	3	0	1	0	0	0	2	21	10.5
	h2	1	0	0	1	0	0	0	5	#¡DIV/0!
-3y+h3	h3	4	0	0	0	1	0	3	30	10
	h4	-4	0	0	0	0	1	0	4	#¡DIV/0!
	y	0	1	0	0	0	0	-1	2	-2
5y+Zj	Zj	3	0	0	0	0	0	-5	10	
-2h5+h1	h1	0.33333333	0	1	0	-0.6666667	0	0	1	
	h2	1	0	0	1	0	0	0	5	
	h5	1.33333333	0	0	0	0.33333333	0	1	10	
	h4	-4	0	0	0	0	1	0	4	
	y	1.33333333	1	0	0	0.33333333	0	0	12	
5h5+Zj	Zj	9.66666667	0	0	0	1.66666667	0	0	60	

x	0
y	12
h1	1
h2	5
h3	0
h4	4
h5	10
Zj	60

3x+2y+h1=25	25
x+h2=5	5
4x+3y+h3=36	36
-4x+h4=4	4
-y+h5=-2	-2