

EJEMPLO APLICACIÓN 2 METODO DE RAMIFICACIÓN Y ACOTAMIENTO

	X1	X2	RHS	Equation form
Maximize		8	5	Max $8X1 + 5X2$
Constraint 1		2	$3 \leq$	$8 \quad 2X1 + 3X2 \leq 8$
Constraint 2		4	$3 \leq$	$10 \quad 4X1 + 3X2 \leq 10$

	X1	X2	X3	X4	
z-c	0	1	0	2	20
X3	0	$1 \frac{1}{2}$	1	$-\frac{1}{2}$	3
X1	1	$\frac{3}{4}$	0	$\frac{1}{4}$	$2 \frac{1}{2}$

SUB PROBLEMA 1

$X1 \leq 2$

	X1	X2	X3	X4	S1	
z-c	0	1	0	2	0	20
X3	0	$1 \frac{1}{2}$	1	$-\frac{1}{2}$	0	3
X1	1	$\frac{3}{4}$	0	$\frac{1}{4}$	0	$2 \frac{1}{2}$
S1	1	0	0	0	1	2
Z	0	1	0	2	0	20
X3	0	$1 \frac{1}{2}$	1	$-\frac{1}{2}$	0	3
X1	1	$\frac{3}{4}$	0	$\frac{1}{4}$	0	$2 \frac{1}{2}$
S1	0	$-\frac{3}{4}$	0	$-\frac{1}{4}$	1	$-\frac{1}{2}$
Z	0	0	0	$1 \frac{2}{3}$	$1 \frac{1}{3}$	$19 \frac{1}{3}$
X3	0	0	1	-1	2	2
X1	1	0	0	0	1	2
X2	0	1	0	$\frac{1}{3}$	$-1 \frac{1}{3}$	$\frac{2}{3}$

$-1 \frac{1}{3} \quad -8$

SUB PROBLEMA 1A

$X2 \leq 0$

	X1	X2	X3	X4	S2	
Z	0	0	0	$1 \frac{2}{3}$	$1 \frac{1}{3}$	0
X3	0	0	1	-1	2	0
X1	1	0	0	0	1	0
X2	0	1	0	$\frac{1}{3}$	$-1 \frac{1}{3}$	0

$\frac{2}{3}$

S2	0	1	0	0	0	1	0
Z	0	0	0	$1 \frac{2}{3}$	$1 \frac{1}{3}$	0	$19 \frac{1}{3}$
X3	0	0	1	-1	2	0	2
X1	1	0	0	0	1	0	2
X2	0	1	0	$\frac{1}{3}$	$-1 \frac{1}{3}$	0	$\frac{2}{3}$
S2	0	0	0	$-\frac{1}{3}$	$1 \frac{1}{3}$	1	$-\frac{2}{3}$
Z	0	0	0	0	8	5	16
X3	0	0	1	0	-2	-3	4
X1	1	0	0	0	1	0	2
X2	0	1	0	0	0	1	0
X4	0	0	0	1	-4	-3	2

-5

SUB PROBLEMA 1B

$X_2 \geq 1$

	X1	X2	X3	X4	S1	S3	
Z	0	0	0	1 2/3	1 1/3	0	19 1/3
X3	0	0	1	-1	2	0	2
X1	1	0	0	0	1	0	2
X2	0	1	0	1/3	-1 1/3	0	2/3
S3	0	-1	0	0	0	1	-1
Z	0	0	0	1 2/3	1 1/3	0	19 1/3
X3	0	0	1	-1	2	0	2
X1	1	0	0	0	1	0	2
X2	0	1	0	1/3	-1 1/3	0	2/3
S3	0	0	0	1/3	-1 1/3	1	- 1/3
Z	0	0	0	2	0	1	19
X3	0	0	1	- 1/2	0	1 1/2	1 1/2
X1	1	0	0	1/4	0	3/4	1 3/4
X2	0	1	0	0	0	-1	1
S1	0	0	0	- 1/4	1	- 3/4	1/4

SUB PROBLEMA 1B A

X1<=1

	X1	X2	X3	X4	S1	S3	S4	
Z	0	0	0	2	0	1	0	19
X3	0	0	1	- 1/2	0	1 1/2	0	1 1/2
X1	1	0	0	1/4	0	3/4	0	1 3/4
X2	0	1	0	0	0	-1	0	1
S1	0	0	0	- 1/4	1	- 3/4	0	1/4
S4	1	0	0	0	0	0	1	1
Z	0	0	0	2	0	1	0	19
X3	0	0	1	- 1/2	0	1 1/2	0	1 1/2
X1	1	0	0	1/4	0	3/4	0	1 3/4
X2	0	1	0	0	0	-1	0	1
S1	0	0	0	1/4	1	- 3/4	0	1/4
S4	0	0	0	- 1/4	0	- 3/4	1	- 3/4
Z	0	0	0	1 2/3	0	0	1 1/3	18
X3	0	0	1	-1	0	0	2	0
X1	1	0	0	0	0	0	1	1
X2	0	1	0	1/3	0	0	-1 1/3	2
S1	0	0	0	1/2	1	0	-1	1
S3	0	0	0	1/3	0	1	-1 1/3	1

SUB PROBLEMA 1B B

$X1 \geq 2$

	X1	X2	X3	X4	S1	S3	S5	
Z	0	0	0	2	0	1	0	19
X3	0	0	1	- 1/2	0	1 1/2	0	1 1/2
X1	1	0	0	1/4	0	3/4	0	1 3/4
X2	0	1	0	0	0	-1	0	1
S1	0	0	0	- 1/4	1	- 3/4	0	1/4
S5	-1	0	0	0	0	0	1	-2
Z	0	0	0	2	0	1	0	19
X3	0	0	1	- 1/2	0	1 1/2	0	1 1/2
X1	1	0	0	1/4	0	3/4	0	1 3/4
X2	0	1	0	0	0	-1	0	1
S1	0	0	0	- 1/4	1	- 3/4	0	1/4
S5	0	0	0	1/4	0	3/4	1	- 1/4

SUB PROBLEMA 2

X1 >= 3

	X1	X2	X3	X4	S1	
z-c	0	1	0	2	0	20
X3	0	1 1/2	1	- 1/2	0	3
X1	1	3/4	0	1/4	0	2 1/2
S1	-1	0	0	0	1	-3
Z	0	0	0	2	0	20
X3	0	1 1/2	1	- 1/2	0	3
X1	1	3/4	0	1/4	0	2 1/2
S1	0	3/4	0	1/4	1	- 1/2