

# EJERCICIO 10

$$\text{for } z_{\min} = 4x_1 + x_2 - M A_1 - 0 C_2 - M A_2 + 0 S_3$$

$$z_{\max} = 4x_1 - x_2 - M A_1 - 0 C_2 - M A_2 + 0 S_3$$

$$\text{Jas}$$

$$\begin{aligned} 5x_1 + x_2 + A_1 &= 3 \\ 4x_1 + 3x_2 - E_1 + A_2 &= 6 \\ x_1 + 2x_2 + 0S_3 &= 4 \end{aligned}$$

$C_j$	$x_1$	$x_2$	$A_1$	$C_2$	$A_2$	$S_3$	$z_j$
$-M A_1$	5	1	1	0	0	0	5/2
$-M A_2$	4	3	0	-1	1	1	6/1.5
$0 S_3$	1	2	0	0	0	0	4/4
$z_j$	$-4M$	$-M$	$M$	$M$	$-M$	$-M$	$-9M$
$C_j - z_j$	$4M$	$M$	0	$-M$	0	$-M$	X
$-4x_1$	0	$2/3$	$1/3$	0	0	0	1/3
$-M A_2$	0	$5/3$	$-1/3$	-1	1	1	2/1.2
$0 S_3$	1	$2/3$	$-1/3$	0	0	0	3/1.2
$z_j$	0	$-2M$	$-M/3$	$M$	$-M$	$-M$	$-6M$
$C_j - z_j$	0	$2M$	$M/3$	$-M$	0	$M$	X
$-4x_1$	0	0	$2/5$	$1/5$	$-1/5$	$-1/5$	$13/5$
$-x_2$	0	1	$-1/5$	$-3/5$	$2/5$	$3/5$	$6/5$
$0 S_3$	1	0	1	1	-1	-1	2
$z_j$	0	-1	$-2/5$	$-1/5$	$1/5$	$1/5$	$-18/5$
$C_j - z_j$	4	0	$2/5$	$1/5$	$-11/5$	$-1/5$	X

$$z = \frac{-18}{5}$$

$$x_1 = 3/5$$

$$x_2 = 6/5$$

$$A_1 = 0$$

$$A_2 = 0$$

$$C_2 = 0$$

$$S_3 = 2$$

$$U_1 = x_1$$

$$U_2 = A_1$$

$$N F_1 = \frac{F_1}{3}$$

$$N F_2 = F_2 - 0 F_1$$

$$F_2' = 4 \ 3 \ 0 \ -1 \ 1 \ 1 \ 6$$

$$(-4) F_1 = 0 \ -1/3 \ 1/3 \ 0 \ 0 \ 0 \ -4$$

$$0 \ 2/3 \ -4/3 \ -1 \ 1 \ 1 \ 2$$

$$N F_3 = F_3 - 5 F_1$$

$$F_3 = 1 \ 2 \ 0 \ 0 \ 0 \ 0 \ 4$$

$$(-1) F_1 = 0 \ -1/3 \ 1/3 \ 0 \ 0 \ 0 \ -1$$

$$1 \ 2/3 \ 1/3 \ 0 \ 0 \ 0 \ 3$$

$$N F_1 = \frac{F_2}{2/3}$$

$$N F_3 = F_3 - 5 F_2$$

$$F_1 = 0 \ 1/3 \ 1/3 \ 0 \ 0 \ 0 \ 1$$

$$(-1/3) F_2 = 0 \ -1/3 \ 2/3 \ 1/5 \ 1/3 \ 1/3 \ -2/3$$

$$0 \ 0 \ 2/3 \ 1/3 \ 1/3 \ 1/3 \ 1/3$$

$$N F_3 = F_3 - 5 F_2$$

$$F_3 = 6 \ 2/3 \ -1/3 \ 0 \ 0 \ 0 \ 4$$

$$(-2/3) F_2 = 0 \ -2/3 \ 4/3 \ 2 \ -1 \ -1 \ -2$$

$$1 \ 0 \ 2 \ 1 \ -1 \ -1 \ 2$$

# EJERCICIO 11

18: Minimize  $Z_{max} = 50x_1 + 10y_1 + 0s_1 - M A_1 - 0e_1 - M A_3$

$Z_{max} = 50x_1 + 10y_1 + 0s_1 - M A_1 - 0e_1 - M A_3$

St:  $2x_1 + 4y_1 + s_1 = 80$   
 $x_1 + y_1 + A_1 = 25$   
 $2x_1 + 6y_1 - e_1 + A_3 = 120$

	$x_1$	$y_1$	$s_1$	$A_1$	$e_1$	$A_3$	$Z_j$
$0s_1$	2	4	1	0	0	0	80/40
$-MA_1$	1	1	0	1	0	0	25/25
$-MA_3$	2	6	0	0	-1	1	120/15
$\theta_j$	0.4	0.6	0	0	0	0	-145M

C1-2:  $80, 30, 70, 10, 0, 0, -M, 0$

	$x_1$	$y_1$	$s_1$	$A_1$	$e_1$	$A_3$	$Z_j$
$0s_1$	0	1/2	1	0	1/4	-1/4	50M/5
$-MA_1$	0	1/4	0	1	1/8	-1/8	10M/15
$-50x_1$	1	2	0	0	-1/2	1/2	15
$\theta_j$	50	10	0	0	-10	10	-10M - 450

C1-2:  $0, 10, 0, 0, 1/4, 1/4, 15$

	$x_1$	$y_1$	$s_1$	$A_1$	$e_1$	$A_3$	$Z_j$
$0s_1$	0	2	1	-2	0	0	50/15
$0e_1$	0	2	0	8	1	-2	80/40
$-50x_1$	1	1	0	1	0	0	25/25
$\theta_j$	50	30	0	-30	0	0	-750

C1-2:  $0, 20, 0, 50, -M, 0, -M$

	$x_1$	$y_1$	$s_1$	$A_1$	$e_1$	$A_3$	$Z_j$
$-10y_1$	0	1	1/2	-1	0	0	15
$0e_1$	0	0	-1	10	1	-1	50
$-50x_1$	1	0	-1/2	2	0	0	25
$\theta_j$	50	10	10	-50	0	0	-450

C1-2:  $0, 0, -10, 50, 0, 0, 0$

	$x_1$	$y_1$	$s_1$	$A_1$	$e_1$	$A_3$	$Z_j$
$0s_1$	0	0	-10	50	0	0	0

$Z = -450$

$x_1 = 10$

$y_1 = 15$

$s_1 = 10$

$A_1 = 50$

$e_1 = 50$

$A_2 = 0$

$A_3 = 0$

$U_0 = X$   $U_0 = A_3$

$NT_0 = \frac{F_1}{2}$

$NT_0 = F_1 - 50 F_2$

$F_1: 1 \ 1 \ 0 \ 1 \ 0 \ 0 \ 25$

(-1)  $F_2: -1 \ -1/2 \ 0 \ 0 \ 1/2 \ -1/2 \ -15$

$0 \ 1/2 \ 0 \ 1 \ 1/2 \ -1/2 \ 10$

$NT_0 = F_1 - 50 F_2$

$F_1: 2 \ 4 \ 1 \ 0 \ 0 \ 0 \ 80$

(-2)  $F_2: -2 \ -1 \ 0 \ 0 \ 1/2 \ -1/2 \ -30$

$0 \ 1/2 \ 1 \ 0 \ 1/2 \ -1/2 \ 50$

$NT_0 = \frac{F_1}{2}$

$NT_0 = F_1 - 50 F_2$

$F_1: 0 \ 1/2 \ 1 \ 0 \ 1/2 \ -1/2 \ 50$

(-1/2)  $F_2: 0 \ -1/2 \ 0 \ -2 \ -1/4 \ 1/4 \ -25$

$0 \ 2 \ 1 \ -2 \ 0 \ 0 \ 50$

$NT_0 = F_1 - 50 F_2$

$F_1: 1 \ 1/4 \ 0 \ 0 \ -1/2 \ 1/2 \ 15$

(1/2)  $F_2: 0 \ 1/4 \ 0 \ 1 \ 1/2 \ -1/2 \ 10$

$1 \ 1 \ 0 \ 1 \ 0 \ 0 \ 25$

$NT_0 = \frac{F_1}{2}$

$NT_0 = F_1 - 50 F_2$

$F_1: 0 \ 2 \ 0 \ 2 \ 1 \ -1 \ 80$

(-1)  $F_2: 0 \ -2 \ -1 \ 2 \ 0 \ 0 \ -30$

$0 \ 0 \ -1 \ 0 \ 1 \ -1 \ 50$

$NT_0 = F_1 - 50 F_2$

$F_1: 1 \ 1 \ 0 \ 1 \ 0 \ 0 \ 85$

(-1)  $F_1: 0 \ -1 \ -1/2 \ 1 \ 0 \ 0 \ -15$

$1 \ 0 \ -1/2 \ 0 \ 0 \ 0$



# EJERCICIO 12

$Z_{\min} = 1,5x_1 + 2x_2 + 0,5s_1 - 0,0e_1 - M A_2$   
 $Z_{\max} = -1,5x_1 + 2x_2 + 0,5s_1 - 0,0e_1 - M A_2$

$S_0:$   
 $2x_1 + 2x_2 + s_1 = 8$   
 $2x_1 + 6x_2 + e_1 + A_2 = 12$

	$x_1$	$x_2$	$s_1$	$e_1$	$A_2$	$Z_i$
$C_1$	$-1,5$	$-2$	$0$	$0$	$-M$	
$0,1$	$2$	$2$	$1$	$0$	$0$	$8/4$
$-M A_2$	$2$	$6$	$0$	$-1$	$1$	$12/2$
$Z$	$-2M$	$-6M$	$0$	$M$	$-M$	$-12M$
$C_1 - Z_i$	$2M - 1,5$	$6M - 2$	$0$	$-M$	$0$	$X$
$0,1$	$4/3$	$0$	$1$	$1/3$	$-1/3$	$4$
$-2x_2$	$1/3$	$2$	$0$	$-1/6$	$1/6$	$2$
$Z$	$-2/3$	$-2$	$0$	$1/3$	$-1/3$	$-4$
$C_1 - Z_i$	$-1/6$	$0$	$0$	$-1/3$	$1/3$	$X$

$b_2 = x_2$        $b_3 = A_2$   
 $v_{F_2} = \frac{F_2}{6}$   
 $N F_1 = F_1 - 5e F_2$   
 $F_1 \begin{matrix} 2 & 2 & 1 & 0 & 0 & 8 \end{matrix}$   
 $(-2) \begin{matrix} F_2 & -\frac{2}{3} & -2 & 0 & \frac{1}{3} & -\frac{1}{3} & -4 \end{matrix}$   
 $\begin{matrix} \frac{4}{3} & 0 & 1 & \frac{1}{3} & -\frac{1}{3} & 4 \end{matrix}$

$Z = -4$   
 $x_1 = 0$   
 $x_2 = 2$   
 $s_1 = 0$   
 $A_2 = 0$