$$\text{Max } z = 500x_1 + 300x_2$$

$$20x_1 + 10x_2 \leq 1000$$

$$3x_1 + 2x_2 \leq 180$$

$$\text{Min } z = 1000y_1 + 180y_2$$

$$20y_1 + 3y_2 \geq 500$$

$$10y_1 + 3y_2 \geq 300$$

$$20y_1 + 3y_2 - s_1 + A_1 = 500$$

$$10y_1 + 2y_2 - s_2 + A_2 = 300$$

$$1000y_1 + 180y_2 - 0s_1 - 0s_2 + MA_1 + MA_2$$

$$1000y_1 - 180y_2 + 0s_1 + 0s_2 - MA - MA_2 = 0$$

z	Y_1	Y_2	S_1	S_2	A_1	A_2	Solución
1	-180	-180	0	0	-M	-M	0
0	20		-1	0	1	0	500
0	10	2	0	-1	0	1	300

0	20M	3M	-M	0	M	0	500M
0	10M	2M	0	-M	0	M	300M
0	30M	5M	-M	-M	M	M	800M
1	-1000	-180	0	0	-M	-M	0
		-180+5M					
1	-1000+30M		-M	-M	0	0	800M

BASE	Z	Y_1	Y_2	S_1	S_2	A_1	A_2	Solución
Z	1	-1000+30M	-180+5M	-M	-M	0	0	800M
A_1	0	20	3	-1	-1	1	0	500/20 = 25
A_2	0	10	2	0	0	0	1	300/10 = 30

0/20	20/20	3/20	-1/20	0/20	1/20	0/20	500/20
0	1	0,15	-0.05	0	0,05	0	25

FV - (CP . FN)

Z FV =	1	-1000+30M	-180+5M	-M	-M	0	0	800M
CP =		-1000+30M						
FN =	0	1	0.15	-0.05	0	0.05	0	25
	1	0	-30+0.5M	-50+6.5M	-M	50-1.5M	0	25000+50M

A_2 FV=	0	10	2	0	-1	0	1	300
CP =	10	10	10	10	10	10	10	10
FN =	0	1	0.15	-0.05	0	0.05	0	25
	0	0	0.5	0.5	-1	-0.5	1	50

BASE	Z	Y_1	Y_2	S_1	S_2	A_1	A_2
Z	1	0	-30+0.5M	-50+0.5M	-M	50-1.5M	0
Y_1	0	1	0.15	-0.05	0	0.05	0
A_2	0	0	0.5	0.5	-1	-0.5	1

Solucion

$25000 + 50M$

$25/0.15 = 16$
6

$50/0.5 = 100$

0/0.5	0/0.5	0.5/0.5	-1/0.5	1/0-5	50/0.5
0	0	1	-2	2	100 Fila Nueva

Z FV=	1	0	-30+0.5M	-50+0.5M	-M	50-1.5M	0
CP=				-30+0.5M			
FN=	0	0	1	1	-2	-1	100

$25000 + 50M$

FN = 100

Y_1 FV=	0	1	0.15	-0.05	0	0	25
CP=	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	0	1	0	-0.2	0.3	-0.3	10

BASE	Z	Y_1	S_1	S_2	A_1	A_2	Solución
Z	1	0	-20	-60	20-M	60-M	2800060-
Y_1	0	1	-0.2	0.3	0.2	-0.3	10
Y_2	0	0	1	-2	-1	2	100

MIN $Z = 1000 Y_1 + 180 Y_2$

$28000 = 1000(10) + 180(100)$

$28000 = 28000$

BASE	Z	X_1	X_2	S_1	S_2	Solución
Z	1	0	0	10	100	28000
X_1	0	1	0	0.2	-1	20
X_2	0	0	1	-0.3	2	60

MAX $Z = 500X_1 + 300X_2$

$28000 = 500(20) + 300(60)$

$28000 = 28000$

PROBLEMA 2

F.O. $\quad Min.\ Z = 4X_1 + 12X_2 + 18X_3$

S.A $\quad X_1 + 3X_3 \geq 3$

$2X_2 + 2X_3 \geq 5$

$X_1, X_2, X_3 \geq 0$

F.O. $\quad Max.\ Z = -4X_1 - 12X_2 - 18X_3$

S.A $\quad -X_1 - 3X_3 \leq -3$

$-2X_2 - 2X_3 \leq -5$

$X_1, X_2, X_3 \geq 0$

F.O. $Z + 4X_1 + 12X_2 + 18X_3 = 0$

$-X_1 - 3X_3 + S_1 = -3$

$-2X_2 - 2X_3 + S_2 = -5$

S_1 y S_2

X_1, X_2, y X_3

Variable Básica	Variables					Solución
	X_1	X_2	X_3	S_1	S_2	
S_1	-1	0	-3	1	0	-3
S_2	0	-2	-2	0	1	-5
Z	4	12	18	0	0	0
Razón		-6	-9	-	0	

Fila Pivote

0	-2	-2	0	1	-5	Fila pivote
-2	-2	-2	-2	-2	-2	Elemento pivote
0	1	1	0	-0,5	2,5	Nueva Fila Pivote

Fila S_1

-1	0	-3	1	0	-3	Fila anterior
0	0	0	0	0	0	Cociente
0	1	1	0	-0,5	2,5	Nuevo Pivote
-1	0	-3	1	0	-3	Nueva Fila

Nueva FILA 2

4	12	18	0	0	0
12	12	12	12	12	12
0	1	1	0	-0,5	2,5
4	0	6	0	6	30

Variable Basica	Variables x_1	x_2	x_3	S_1	S_2	Solución
S_1	-1	0	-3	1	0	-3
x_2	0	1	1	0	-1	2,5
Z	4	0	6	0	6	-30
-	-4		-2	0		

...

Variable Básica	Variables x_1	x_2	x_3	S_1	S_2	Solución
x_3	0,33	0	1	-0,33	0	1
x_2	-0,33	1	0	0,33	-0,5	1,5
Z	2	0	0	2	6	-36

R/ Valor mínimo $x_2 = 3/2$, $x_3 = 1$ y $Z = 36$