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BSIT 2-2

1.) I Objective:

Minimize $w = 6x_1 + 2x_2 + 3x_3$

II. Constraints

$3x_1 + 2x_2 + x_3 \geq 28$

$6x_1 + x_3 \geq 24$

$3x_1 + x_2 + 2x_3 \geq 40$

$x_1, x_2, x_3 \geq 0$

Matriv

x_1	x_2	x_3	C
3	2	1	28
6	0	1	24
3	1	2	40
6	2	3	0

Transpose matrix

3	6	3	6
2	0	1	2
1	1	2	3
28	24	40	0

Dual:

I. Objective:

Maximize $z = 28y_1 + 24y_2 + 40y_3 \rightarrow -28y_1 - 24y_2 - 40y_3 + z = 0$

II. constraints

$3y_1 + 6y_2 + 3y_3 \leq 6 \rightarrow 3y_1 + 6y_2 + 3y_3 + S_1 = 6$

$2y_1 + y_3 \leq 2 \rightarrow 2y_1 + y_3 + S_2 = 2$

$y_1 + y_2 + 2y_3 \leq 3 \rightarrow y_1 + y_2 + 2y_3 + S_3 = 3$

1.)

y_1	y_2	y_3	S_1	S_2	S_3	z	C	
3	6	3	1	0	0	0	6	2
2	0	1	0	1	0	0	2	2
1	1	(2)	0	0	1	0	3	1.5 $R'_3 \times \frac{1}{2}$
-28	-24	-40	0	0	0	1	0	

2.)

3	6	3	1	0	0	0	6	$R'_1: R_1 - 3R_3$
2	0	1	0	1	0	0	2	$R'_2: R_2 - R_3$
½	½	1	0	0	½	0	1.5	
-28	-24	-40	0	0	0	1	0	$R'_4: R_4 + 40R_3$

y_1	y_2	y_3	s_1	s_2	s_3	z	C
3/2	9/2	0	1	0	-1/2	0	3/2
3/2	-1/2	0	0	1	-1/2	0	1/2
1/2	1/2	1	0	0	1/2	0	1.5
-8	-4	0	0	0	20	1	60

3/2	9/2	0	1	0	-1/2	0	3/2	1
3/2	-1/2	0	0	1	-1/2	0	1/2	1/3
1/2	1/2	1	0	0	1/2	0	1.5	3
-8	-4	0	0	0	20	1	60	

3/2	9/2	0	1	0	-1/2	0	3/2	$R_1' : R_1 - 3/2 R_2$
1	-1/3	0	0	2/3	-1/3	0	1/3	
1/2	1/2	1	0	0	1/2	0	1.5	$R_3' : R_3 - 1/2 R_2$
-8	-4	0	0	0	20	1	60	$R_4' : R_4 + 8 R_2$

0	5	0	1	-1	0	0	1	1/5
1	-1/3	0	0	2/3	-1/3	0	1/2	-3/2
0	1/4	1	0	-1/3	2/3	0	4/3	3/16
0	-20/3	0	0	16/3	68/3	1	173/3	

0	5	0	1	-1	0	0	1	$R_1' : R_1 - 5 R_3$
1	-1/3	0	0	2/3	-1/3	0	1/2	$R_2 : R_1 + 1/3 R_3$
0	1	4	0	-4/3	8/3	0	16/3	
0	-20/3	0	0	16/3	68/3	1	173/3	$R_4 : R_4 + 20/3 R_3$

0	0	-5	1	17/3	-40/3	0