— SIMPLEX [TYPE II]

(3) $Z = 10x_1 + x_2 + x_3$

SUB, $x_1 + x_2 - 3x_3 \leq 10$

$4x_1 + x_2 + x_3 \leq 20$

WHERE, $x_1, x_2, x_3 \geq 0$

CONVERTING TO STD. FORM

$Z = 10x_1 + x_2 + x_3 + 0s_1 + 0s_2$

$Z - 10x_1 - x_2 - x_3 - 0s_1 - 0s_2 = 0$

$x_1 + x_2 - 3x_3 + s_1 = 10$

$4x_1 + x_2 + x_3 + s_2 = 20$

WHERE $x_1, x_2, x_3, s_1, s_2 \geq 0$

$X - \frac{self}{circle} . Y$

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BASIC VAR	x_1	x_2	x_3	s_1	s_2	SOL	RATIO	FORMULA
Z	-10	-1	-1	0	0	0	—	$X = -10/4 . Y$
s_1	1	1	-3	1	0	10	10	$X - 1/4 . Y$
s_2	4	1	1	0	1	20	5	$Y/4$
Z	0	3/2	3/2	0	5/2	50	—	ALL POSITIVE
s_1	0	3/4	-13/4	1	-1/4	5		
x_1	1	1/4	1/4	0	1/4	5		

→ $Z_{max} = 50$

$x_1 = 5$

$x_2 = 0$

$x_3 = 0$

(6) MAX, $Z = 7x_1 + 5x_2$

SUB, $-x_1 - 2x_2 \geq -6$

$4x_1 + 3x_2 \leq 12$

WHERE, $x_1, x_2 \geq 0$

FLIP SIGNS OF FIRST CONSTRAINTS

$x_1 + 2x_2 \leq 6$

CONVERTING TO STD. FORM

$Z = 7x_1 + 5x_2 + 0s_1 + 0s_2$

$Z - 7x_1 - 5x_2 + 0s_1 + 0s_2 = 0$

$x_1 + 2x_2 + s_1 = 6$

$4x_1 + 3x_2 + s_2 = 12$

WHERE $x_1, x_2, s_1, s_2 \geq 0$

ITERATION	BASIC VAR.		x_1	x_2	s_1	s_2	SOL	RATIO	FORMULA
0	Z	-7	-5	0	0	0	-		X - -7/4 Y
	s_1	1	2	1	0	6	6		X -1/4 Y
	s_2	4	3	0	1	12	3		Y/4
1	Z	0	1/4	0	7/4	21	-		ALL POSITIVE
	s_1	0	5/4	1	-1/4	3			
	x_1	1	3/4	0	1/4	3			

→ $Z_{max} = 21$

$x_1 = 3$

$x_2 = 0$

(14) MAX, $Z = 3x_1 + 2x_2 + 5x_3$

SUB, $x_1 + 2x_2 + x_3 \leq 430$

$3x_1 + 2x_3 \leq 460$

$x_1 + 4x_2 \leq 420$

WHERE, $x_1, x_2, x_3 \geq 0$

CONVERTING TO STD. FORM.

$Z = 3x_1 + 2x_2 + 5x_3 + 0s_1 + 0s_2 + 0s_3$

$Z - 3x_1 - 2x_2 - 5x_3 - 0s_1 - 0s_2 - 0s_3 = 0$

$x_1 + 2x_2 + x_3 + s_1 = 430$

$3x_1 + 0x_2 + 2x_3 + s_2 = 460$

$x_1 + 4x_2 + 0.x_3 + s_3 = 420$

WHERE, $x_1, x_2, x_3, s_1, s_2, s_3 \geq 0$

ITERA.	BASIC VAR.	x_1	x_2	x_3	s_1	s_2	s_3	SOLUTION	RATIO	FORMULA
0	Z	-3	-2	-5	0	0	0	0	—	$X - 5/2\,Y$
	s_1	1	2	1	1	0	0	430	430	$X - 1/2\,Y$
	s_2	3	0	2	0	1	0	460	230	$Y/2$
	s_3	1	4	0	0	0	1	420	—	—
1	Z	9/2	-2	0	0	5/2	0	1150	—	$X - 2/2\,Y$
	s_1	-1/2	2	0	1	-1/2	0	200	100	$Y/2$
	x_3	3/2	0	1	0	1/2	0	230	—	—
	s_3	1	4	0	0	0	1	420	105	$X - 4/2\,Y$
2	Z	4	0	0	1	2	0	1350	—	ALL POSITIVE
	x_2	-1/4	1	0	1/2	-1/4	0	100		
	x_3	3/2	0	1	0	1/2	0	230		
	s_3	2	0	0	-2	1	1	20		

→ $Z_{max} = 1350$

$x_1 = 0$

$x_2 = 100$

$x_3 = 230$