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Max Z = 2x1 + x2 + 3x3

Batasan:

x1 + x2 + x3 ≤ 59

2x1 + 3x3 ≤ 75

x2 + 6x3 ≤ 54

x1 ≥ 0, x2 ≥ 0, x3 ≥ 0

Jawaban :

x1 + x2 + x3 ≤ 59 => **x1 + x2 + x3 + S1= 59**

2x1 + 3x3 ≤ 75 => **2x1 + 3x3 + S2 = 75**

x2 + 6x3 ≤ 54 => **x2 + 6x3 + S3 = 54**

Max Z = 2x1 + x2 + 3x3 + 0 S1 + 0 S2 + 0 S3

cj	Variabel		2	1	3	0	0	0
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3
0	S1	59	1	1	1	1	0	0
0	S2	75	2	0	3	0	1	0
0	S3	54	0	1	6	0	0	1
	zj	0	0	0	0	0	0	0
	cj - zj		2	1	3	0	0	0

Menentukan Kolom Pivot :

cj – zj = 3 (terbesar)

cj	Variabel		2	1	3	0	0	0	Kuantitas
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	/ Kol pivot
0	S1	59	1	1	1	1	0	0	59/1 = 59
0	S2	75	2	0	3	0	1	0	75/3 = 25
0	S3	54	0	1	6	0	0	1	54/6 = 9
	Zj	0	0	0	0	0	0	0	
	cj - zj		2	1	3	0	0	0	

Menentukan Baris Pivot = 9

Menentukan Nilai Pivot = 6

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
3	X3	54 /6	0/6	1/6	6/6	0/6	0/6	1/6	
0	S1								
	zj								
	cj - zj								

Memperbaiki Tabel Simpleks

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
3	X3	9	0	1/6	1	0	0	1/6	
0	S1								
	zj								
	cj - zj								

Baris S1 baru = Baris S1 lama – (nilai S1 sekolom pivot) * Baris pivot

	(59	1	1	1	1	0	0)
X1	(9	0	1/6	1	0	0	1/6)
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	(50	1	5/6	0	1	0	-1/6)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
3	X3	9	0	1/6	1	0	0	1/6	= 9/0 = ?
0	S1	50	1	5/6	0	1	0	-1/6	=50/1 = 50
0	S2								
	zj								
	cj - zj								

Baris S2 baru = Baris S2 lama – (nilai S2 sekolom pivot) * Baris pivot

	(75	2	0	3	0	1	0)
X3	(9	0	1/6	1	0	0	1/6)
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(48 2 -3/6 0 0 1 -3/6)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
3	X3	9	0	1/6	1	0	0	1/6	= 9/0 = ?
0	S1	50	1	5/6	0	1	0	-1/6	=50/1 = 50
0	S2	48	2	-3/6	0	0	1	-3/6	=48/2=24
	zj	27	0	½	3	0	0	1/2	
	cj - zj		2	1/2	0	0	0	-1/2	

Menentukan Kolom Pivot :

cj – zj = 2 (terbesar)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
3	X3	9	0	1/6	1	0	0	1/6	= 9/0 = ?
0	S1	50	1	5/6	0	1	0	-1/6	=50/1 = 50
0	S2	48	2	-3/6	0	0	1	-3/6	=48/2=24
	zj	27	0	1/2	3	0	0	1/2	
	cj - zj		2	1/2	0	0	0	-1/2	

Menentukan Baris Pivot = 24

Menentukan Nilai Pivot = 2

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	48/2	2/2	(-3/6)/2	0/2	0/2	1/2	(-3/6)/2	
0	S1	26	0	13/12	0	1	-1/2	1/12	
	zj								
	cj - zj								

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	24	1	-1/4	0	0	1/2	-1/4	
0	S1	26	0	13/12	0	1	-1/2	1/12	
	zj								
	cj - zj								

Baris S1 baru = Baris S1 lama – (nilai S1 sekolom pivot) * Baris pivot

(50 1 5/6 0 1 0 -1/6)

X1 (24 1 -1/4 0 1 -1/2 1/12)

(26 0 13/12 0 1 -1/2 1/12)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	24	1	-1/4	0	0	1/2	-1/4	
0	S1	26	0	13/12	0	1	-1/2	1/12	
3	X3								
	zj								
	cj - zj								

Baris X3 baru = Baris X3 lama – (nilai X3 sekolom pivot) * Baris pivot

(9 0 1/6 1 0 0 1/6)

X0 (24 1 -1/4 0 0 1/2 -1/4)

(9 0 1/6 1 0 0 1/6)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	24	1	-1/4	0	0	1/2	-1/4	-96
0	S1	26	0	13/12	0	1	-1/2	1/12	24
3	X3	9	0	1/6	1	0	0	1/6	54
	zj	75	2	0	3	0	0	0	
	cj - zj		0	1	0	0	-1	0	

Menentukan Baris Pivot = 24 (nilai minus tidak dianggap)

Menentukan Nilai Pivot = 13/12

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1								
1	X2	24	0	1	0	12/13	-6/13	1/13	
	zj								
	cj - zj								

Baris X1 baru = Baris X1 lama – (nilai X1 sekolom pivot) * Baris pivot

(24 1 -1/4 0 0 1/2 -1/4)

X(-1/4) (24 0 1 0 12/13 -6/13 1/13)

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(30 1 0 0 3/13 5/13 -3/13)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	30	1	0	0	3/13	5/13	-3/13	
1	X2	24	0	1	0	12/13	-6/13	1/13	
3	X3								
	zj								
	cj - zj								

Baris X3 baru = Baris X3 lama – (nilai X3 sekolom pivot) * Baris pivot

(9 0 1/6 1 0 0 1/6)

X(-1/4) (24 0 1 0 12/13 -6/13 1/13)

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(5 0 0 1 -2/13 1/13 2/13)

cj	Variabel		2	1	3	0	0	0	
	Basis	Kuantitas	X1	X2	X3	S1	S2	S3	
2	X1	30	1	0	0	3/13	5/13	-3/13	
1	X2	24	0	1	0	12/13	-6/13	1/13	
3	X3	5	0	0	1	-2/13	1/13	2/13	
	zj	99	2	1	3	12/13	7/13	1/13	
	cj - zj		0	0	0	-12/13	-7/13	-1/13	

Karena semua hasil pada baris cj – zj hasil nya 0 dan negative, maka bisa dikatakan sudah optimal

Solusi :

X1 = 2

X2 = 1

X3 = 3

Z = 99