Metode Simpleks

Aturan yang dapat digunakan untuk memudahkan penyelesaian:

Batasan	Penyesuaian Fungsi Batasan	Koefisien Fungsi Tujuan	
		Maksimisasi	Minimisasi
≤	Tambah slack variabel S	0	0
=	Tambah artificial variabel (R)	-M	M
≥	Kurang slack variabel –S Dan tambah artificial variabel (R)	0 -M	0 M

Contoh

- Minimumkan Z = 2X1 + 3X2
- Batasan:

  $\frac{1}{2}$X1 + $\frac{1}{4}$X2 ≤ 4

  X1 + 3X2 ≥ 20

  X1 + X2 =10

  X1, X2 ≥ 0

Penyelesaian

- Minimumkan Z = 2X1 + 3X2 + Ma1 + Ma2 →

  Z - 2X1 - 3X2 - Ma1 - Ma2 =0

- Batasan:

  $\frac{1}{2}$X1 + $\frac{1}{4}$X2 + S1 = 4

  X1 + 3X2 – S2 + a1 = 20

  X1 + X2 + a2 =10

	-2	-3			-M	-M	
M	2	4	0	-1	1	1	30
	2M-2	4M-3	0	-M	0	0	30M

Variabel	Z	X1	X2	S1	S2	a1	a2	NK	Indeks
Z	1	2M-2	4M-3	0	-M	0	0	30M	
S1	0	0.5	0.25	1	0	0	0	4	4*4=16
a1	0	1	3	0	-1	1	0	20	20/3
a2	0	1	1	0	0	0	1	10	10

Variabel	Z	X1	X2	S1	S2	a1	a2	NK	Indeks
Z	1	(2M-3)/3	0	0	(M-3)/3	(-4M+3)/3	0	(10M+60)/3	
S1	0	5/12	0	1	1/12	-1/12	0	7/3	7/3*12/5
X2	0	1/3	1	0	-1/3	1/3	0	20/3	20/3*3/1
a2	0	2/3	0	0	1/3	-1/3	1	10/3	10/3*3/2
		(2M-2 4M-3 0 -M 0 0 30M) -(4M-3)*(1/3 1 0 -1/3 1/3 0 20/3)							
		(1/2 1/4 1 0 0 0 4) - 1/4*(1/3 1 0 -1/3 1/3 0 20/3)							
		(1 1 0 0 0 1 10) - 1*(1/3 1 0 -1/3 1/3 0 20/3)							

Variabel	Z	X1	X2	S1	S2	a1	a2	NK	Indeks
Z	1	0	0	0	-1/2	(2M-1)/2	(-2M+3)/2	25	
S1	0	0	0	1	-1/8	1/8	-5/8	1/4	
X2	0	0	1	0	-1/2	1/2	-1/2	5	
X1	0	1	0	0	1/2	-1/2	3/2	5	
		(2M-3)/3	0	0	(M-3)/3	(-4M+3)/3	0	(10M+60)/3	-((2M-3)/3)*(1 0 0 1/2 -1/2 3/2 5)
		5/12	0	1	1/12	-1/12	0	7/3	-5/12*(1 0 0 1/2 -1/2 3/2 5)
		1/3	1	0	-1/3	1/3	0	20/3	-1/3*(1 0 0 1/2 -1/2 3/2 5)

Jadi X1 = 5, X2 = 5 dan Z = 25

Soal Latihan

- Fungsi tujuan : Minimumkan Z = 2X1 + 3X2
- Batasan:

  $\frac{1}{2}$X1 + $\frac{1}{4}$X2 ≤ 4

  X1 + 3X2 ≥ 36

  X1 + X2 =10

  X1, X2 ≥ 0