2-Labaratoriya
2-Variant

$F(x) = 200x_1+240x_2 \rightarrow max$

$$\begin{cases} 1.2x_1 + 0.2x_2 \le 50 \\ 0.4x_1 + 0.8x_2 \le 30 \end{cases}$$

$\Rightarrow$

$F(x) = 50x_1+30x_2 \rightarrow min$

$$\begin{cases} 1.2x_1 + 0.4x_2 \ge 200 \\ 0.2x_1 + 0.8x_2 \ge 240 \end{cases}$$

$F(x) = 50x_1+30x_2 \rightarrow min$

$$\begin{cases} 1.2x_1 + 0.4x_2 \ge 200 \\ 0.2x_1 + 0.8x_2 \ge 240 \end{cases}$$

$\Rightarrow$

$F(x) = 50x_1+30x_2+0x_3+0x_4+Mx_5+Mx_6 \rightarrow min$

$$\begin{cases} 1.2x_1 + 0.4x_2 - x_3 + x_5 = 200 \\ 0.2x_1 + 0.8x_2 - x_4 + x_6 = 240 \end{cases}$$

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	Q
			50	30	0	0	M	M	
x_5 ←	M	200	1.2	0.4	-1	0	1	0	166.67
x_6	M	240	0.2	0.8	0	-1	0	1	1200
min		440M	1.4M-50	1.2M-30	-M	-M	0	0	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	Q
			50	30	0	0	M	M	
x_1	50	166.67	1	0.33	-0.83	0	0.83	0	500
x_6 ←	M	206.67	0	0.73	0.17	-1	-0.17	1	281.82
min		206.67M+8333.33	0	0.73M-13.33	0.17M-41.67	-M	-1.17M+41.67	0	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	Q
			50	30	0	0	M	M	
x_1	50	72.73	1	0	-0.91	0.45	0.91	-0.45	
x_2	30	281.82	0	1	0.23	-1.36	-0.23	1.36	
min		12090.91	0	0	-38.64	-18.18	-M+38.64	-M+18.18	

F* = 12090.91

X* = (72.73; 281.82)

2.1

$F(x) = 2x_1+2x_2+3x_3 \rightarrow max$

$$\begin{cases} -2x_1 +3x_2 -5x_3 \le 12 \\ 2x_1 -x_2 +4x_3 \le 24 \\ 3x_1 +x_2 +x_3 \le 18 \end{cases}$$

$\Rightarrow$

$F(x) = 12x_1+24x_2+18x_3 \rightarrow min$

$$\begin{cases} -2x_1 +2x_2 +3x_3 \ge 2 \\ 3x_1 -x_2 +x_3 \ge 2 \\ -5x_1 +4x_2 +x_3 \ge 3 \end{cases}$$

$F(x) = 12x_1+24x_2+18x_3 \rightarrow min$

$$\begin{cases} -2x_1 +2x_2 +3x_3 \ge 2 \\ 3x_1 -x_2 +x_3 \ge 2 \\ -5x_1 +4x_2 +x_3 \ge 3 \end{cases}$$

$\Rightarrow$

$F(x) = 12x_1+24x_2+18x_3+0x_4+0x_5+0x_6+Mx_7+Mx_8+Mx_9 \rightarrow min$

$$\begin{cases} -2x_1 +2x_2 +3x_3 -x_4 +x_7 = 2 \\ 3x_1 -x_2 +x_3 -x_5 +x_8 = 2 \\ -5x_1 +4x_2 +x_3 -x_6 +x_9 = 3 \end{cases}$$

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_7 ←	M	2	-2	2	3	-1	0	0	1	0	0	0.67
x_8	M	2	3	-1	1	0	-1	0	0	1	0	2
x_9	M	3	-5	4	1	0	0	-1	0	0	1	3
min		7M	-4M-12	5M-24	5M-18	-M	-M	-M	0	0	0	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_3	18	0.67	-0.67	0.67	1	-0.33	0	0	0.33	0	0	1
x_8	M	1.33	3.67	-1.67	0	0.33	-1	0	-0.33	1	0	-0.8
x_9 ←	M	2.33	-4.33	3.33	0	0.33	0	-1	-0.33	0	1	0.7
min		3.67M+12	-0.67M-24	1.67M-12	0	0.67M-6	-M	-M	-1.67M+6	0	0	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_3 ←	18	0.2	0.2	0	1	-0.4	0	0.2	0.4	0	-0.2	1
x_8	M	2.5	1.5	0	0	0.5	-1	-0.5	-0.5	1	0.5	1.67
x_2	24	0.7	-1.3	1	0	0.1	0	-0.3	-0.1	0	0.3	-0.54
min		2.5M+20.4	1.5M-39.6	0	0	0.5M-4.8	-M	-0.5M-3.6	-1.5M+4.8	0	-0.5M+3.6	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_1	12	1	1	0	5	-2	0	1	2	0	-1	-0.5
x_8 ←	M	1	0	0	-7.5	3.5	-1	-2	-3.5	1	2	0.29
x_2	24	2	0	1	6.5	-2.5	0	1	2.5	0	-1	-0.8
min		1M+60	0	0	-7.5M+198	3.5M-84	-M	-2M+36	-4.5M+84	0	1M-36	

B	Cb	P	x_1	x_2	x_{11}	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_1 ←	12	1.57	1	0	0.71	0	-0.57	-0.14	0	0.57	0.14	2.2
x_4	0	0.29	0	0	-2.14	1	-0.29	-0.57	-1	0.29	0.57	-0.13
x_2	24	2.71	0	1	1.14	0	-0.71	-0.43	0	0.71	0.43	2.37
min		84	0	0	18	0	-24	-12	-M	-M+24	-M+12	

B	Cb	P	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	Q
			12	24	18	0	0	0	M	M	M	
x_3	18	2.2	1.4	0	1	0	-0.8	-0.2	0	0.8	0.2	
x_4	0	5	3	0	0	1	-2	-1	-1	2	1	
x_2	24	0.2	-1.6	1	0	0	0.2	-0.2	0	-0.2	0.2	
min		44.4	-25.2	0	0	0	-9.6	-8.4	-M	-M+9.6	-M+8.4	

$F^* = 44.4$

$X^* = (0; 0.2; 2.2)$