Домашня робота №4

ЗД 17.03

№1

$$Z = 4x_1 - 2x_2 - 5x_3 \to min$$

$$\begin{cases} 2x_1 + 3x_2 + x_3 \geq 6 \\ x_1 + 3x_2 + 4x_3 \geq 15 \end{cases}$$

в	x_1	x_2	x_3
6	2	3	1
15	1	3	4

$$B(0) = \begin{matrix} A_4 \\ A_5 \end{matrix}\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

	C^0	B^0	$B(0)$
A_4	0	6	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
A_5	0	15	

$u^0 = (0;0)$; $\Delta_1^0 = 4$; $\Delta_2^0 = -2$; $\Delta_3^0 = -5$

в	A_1	A_2	A_3	A_4	A_5
6	2	3	1	1	0
15	1	3	4	0	1
Δ^0	4	-2	(-5)	0	0
Δ^1	21/4	7/4	0	0	5/4

$$B^0 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 6 \\ 15 \end{pmatrix} = \begin{pmatrix} 6 \\ 15 \end{pmatrix}$$

$$\alpha^0 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ 4 \end{pmatrix} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$$

6/1 = 6

15/4 = 3,75 - min

$$B(1) = \begin{pmatrix} 1 & 1 \\ 0 & 4 \end{pmatrix}; \quad B^{-1}(1) = \begin{pmatrix} 1 & -1/4 \\ 0 & 1/4 \end{pmatrix}$$

$$u^1 = \underset{A_4\ A_5}{(0\ -5)}\begin{pmatrix} 1 & -1/4 \\ 0 & 1/4 \end{pmatrix} = \left(0\ -\frac{5}{4}\right)$$

$$\Delta_1^1 = 4 - \left(0\ -\frac{5}{4}\right)\begin{pmatrix} 2 \\ 1 \end{pmatrix} = 4 + \frac{5}{4} = 5{,}25; \quad \Delta_2^1 = -2 - \left(0\ -\frac{5}{4}\right)\begin{pmatrix} 3 \\ 3 \end{pmatrix} = -2 + \frac{15}{4} = \frac{7}{4}$$

$$\Delta_3^1 = -5 - \left(0\ -\frac{5}{4}\right)\begin{pmatrix} 1 \\ 4 \end{pmatrix} = 0; \quad \Delta_4^1 = 0; \quad \Delta_5^1 = 0 - \left(0\ -\frac{5}{4}\right)\begin{pmatrix} 0 \\ 1 \end{pmatrix} = \frac{5}{4}$$

$$\beta^1 = \begin{pmatrix} 1 & -\frac{1}{4} \\ 0 & 1/4 \end{pmatrix}\begin{pmatrix} 6 \\ 15 \end{pmatrix} = \begin{matrix} 9/4 \\ 15/4 \end{matrix}\begin{matrix} A_4 \\ A_5 \end{matrix}; \quad (0;0;15/4;9/4;0) \to 2 = 5 \cdot \frac{15}{4} = \frac{75}{4}$$

Відповідь

№2

$$Z = 7x_1 - 6x_2 - x_3 \to \min$$

$$\begin{cases} x_1 + 2x_2 - x_3 \geq 2 \\ x_2 + 10x_3 \geq 32 \end{cases}$$

в	x_1	x_2	x_3
2	1	2	-1
32	0	1	10

$B_{(0)} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ (A_1 A_4)

	C^0	β^0	$B_{(0)}$
A_1	0	2	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
A_4	0	32	

$u^0 = (7;0)$; $\Delta_1^0 = 0$; $\Delta_2^0 = -6 \cdot (7;0)\begin{pmatrix} 2 \\ 1 \end{pmatrix} = -20$; $\Delta_3^1 = -1 \cdot 7 = 6$

в	A_1	A_2	A_3	A_4
2	1	2	-1	0
32	0	1	10	1
Δ^0	0	(-20)	6	0
Δ^1	10	0	(-4)	0

$B_\beta^0 = \begin{pmatrix} 2 \\ 32 \end{pmatrix}$; $\alpha^0 = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$; $2/2 = 1$ — min; $32/1 = 32$

$B_{(1)} = \begin{pmatrix} 2 & 0 \\ 1 & 1 \end{pmatrix}$;

$B_{(1)}^{-1} = \begin{pmatrix} 1/2 & 0 \\ -1/2 & 1 \end{pmatrix}$;

$u^1 = (-6\ 0)\begin{pmatrix} 1/2 & 0 \\ -1/2 & 1 \end{pmatrix} = (-3\ 0)$

$\Delta_1^1 = 7 - (-3\ 0)\begin{pmatrix} 1 \\ 0 \end{pmatrix} = 7 + 3 = 10$; $\Delta_2^1 = 0$

$\Delta_3^1 = -1 - (-3\ 0)\begin{pmatrix} -1 \\ 10 \end{pmatrix} = -1 - 3 = -4$

$\beta_\beta^1 = \begin{pmatrix} 1/2 & 0 \\ -1/2 & 1 \end{pmatrix}\begin{pmatrix} 2 \\ 32 \end{pmatrix} = \begin{pmatrix} 1 \\ 31 \end{pmatrix}$; $\alpha^1 = \begin{pmatrix} 1/2 & 0 \\ -1/2 & 1 \end{pmatrix}\begin{pmatrix} -1 \\ 10 \end{pmatrix} = \begin{pmatrix} -0,5 \\ -10,5 \end{pmatrix}$

$B_{(2)} = \begin{pmatrix} 2 & -1 \\ 1 & 10 \end{pmatrix}$; $B_{(2)}^{-1} = \begin{pmatrix} 10/21 & 1/21 \\ -1/21 & 1/21 \end{pmatrix}$???