

28.01.25: (g./j.)

Nº 6. $Z = 5x_1 + 4x_2$

$$x_1 + 2x_2 \leq 8$$

$$3x_1 + x_2 \leq 10$$

$$x_1, x_2 \geq 0$$

$$x_1 + 2x_2 + x_3 = 8$$

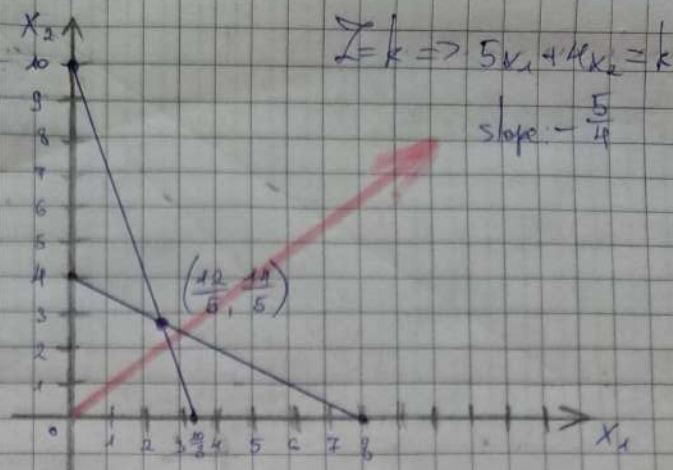
$$3x_1 + x_2 + x_4 = 10$$

$$x_1, x_2, x_3, x_4 \geq 0$$

Basis	$\overline{x_1}$	x_2	x_3	x_4	b
x_3	1	2	1	0	8
x_4	3	1	0	1	10
Z	-5	-4	0	0	0

pivot el: 3.

Basis	x_1	x_2	x_3	x_4	b
x_2	0	1	0,6	-0,2	2,8
x_1	1	1/3	0	1/3	10/3
Z	0	0	1,4	1,2	23,2



Basis	x_1	$\overline{x_2}$	x_3	x_4	b
x_3	0	5/3	1	-1/3	14/3
x_1	1	1/3	0	1/3	10/3
Z	0	-5/3	0	5/3	50/3

pivot el: 5/3.

$$x_2 = 2,8$$

$$x_1 + \frac{1}{3}x_2 = \frac{10}{3}, \quad x_1 = 2,4$$

$$2,4 \cdot 5 + 2,8 \cdot 4 = 12 + 11,2 = 23,2$$

Signale: $x_1 = 2,4; x_2 = 2,8; Z = 23,2$

Nº 8. $Z = 3x_1 + 4x_2$

$$2x_1 + 3x_2 \leq 18$$

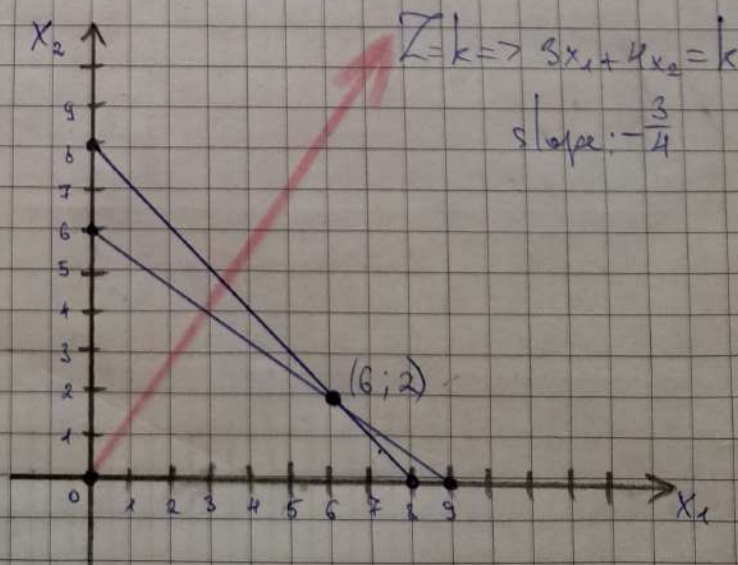
$$x_1 + x_2 \leq 8$$

$$x_1, x_2 \geq 0$$

$$2x_1 + 3x_2 + x_3 = 18$$

$$x_1 + x_2 + x_4 = 8$$

$$x_1, x_2, x_3, x_4 \geq 0$$



Basis	x_1	x_2	x_3	x_4	b
$[x_3]$	2	3	1	0	18
x_4	1	1	0	1	8
Z	-3	-4	0	0	0

pivot el.: 3

Basis	x_1	x_2	x_3	x_4	b
x_2	$\frac{2}{3}$	1	$\frac{1}{3}$	0	6
x_1	1	0	-1	3	6
Z	0	0	1	1	26

Basis	x_1	x_2	x_3	x_4	b
x_2	$\frac{2}{3}$	1	$\frac{1}{3}$	0	6
$[x_4]$	$\frac{1}{3}$	0	$-\frac{1}{3}$	1	2
Z	$-\frac{1}{3}$	0	$\frac{4}{3}$	0	24

pivot el.: $\frac{1}{3}$

$$x_1 = 6$$

$$\frac{2}{3}x_1 + x_2 = 6, \quad x_2 = 2$$

$$3 \cdot 6 + 4 \cdot 2 = 18 + 8 = 26.$$

Bequels: $x_1 = 6; x_2 = 2; Z = 26$.

$$N \leq 10, \quad Z = 10x_1 + 15x_2$$

$$2x_1 + x_2 \leq 20$$

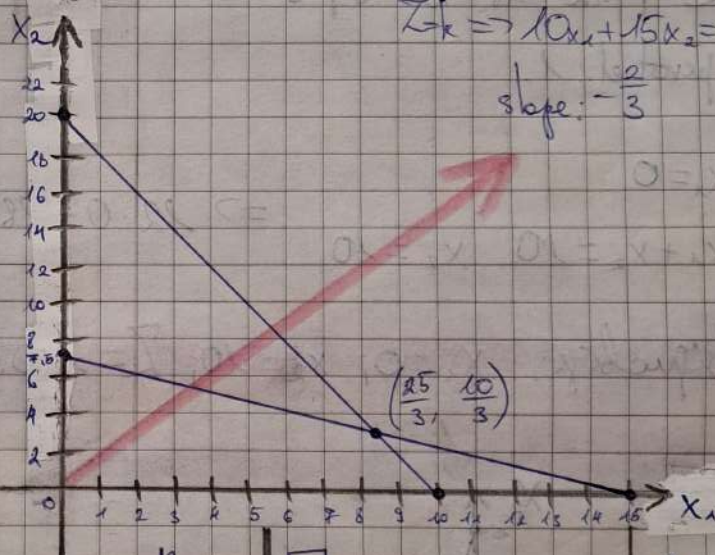
$$x_1 + 2x_2 \leq 15$$

$$x_1, x_2 \geq 0$$

$$2x_1 + x_2 + x_3 = 20$$

$$x_1 + 2x_2 + x_4 = 15$$

$$x_1, x_2, x_3, x_4 \geq 0$$



$$Z = k \Rightarrow 10x_1 + 15x_2 = k$$

slope: $-\frac{2}{3}$

Basis	x_1	x_2	x_3	x_4	b
x_3	2	1	1	0	20
$[x_4]$	1	2	0	1	15
Z	-10	-15	0	0	0

pivot el.:

Basis	x_1	x_2	x_3	x_4	b
$[x_3]$	$\frac{3}{2}$	0	1	$-\frac{1}{2}$	$\frac{25}{2}$
x_2	$\frac{1}{2}$	1	0	$\frac{1}{2}$	$\frac{15}{2}$
Z	$-\frac{5}{2}$	0	0	$\frac{15}{2}$	$\frac{225}{2}$

Basis	x_1	x_2	x_3	x_4	b
x_1	1	0	$\frac{2}{3}$	$-\frac{1}{3}$	$\frac{25}{3}$
x_2	$\frac{1}{2}$	1	0	$\frac{1}{2}$	$\frac{15}{2}$
Z	0	0	$\frac{5}{3}$	$\frac{20}{3}$	$\frac{400}{3}$

$$x_1 = \frac{25}{3}$$

$$\frac{1}{2}x_1 + x_2 = \frac{15}{2}, \quad x_2 = 3$$

$$10 \cdot \frac{25}{3} + 15 \cdot \frac{10}{3} = \frac{250 + 150}{3} = \frac{400}{3}$$

Bequels: $x_1 = \frac{25}{3}; x_2 = 3; Z = \frac{400}{3}$.

No 12. $Z = 12x_1 + 18x_2$

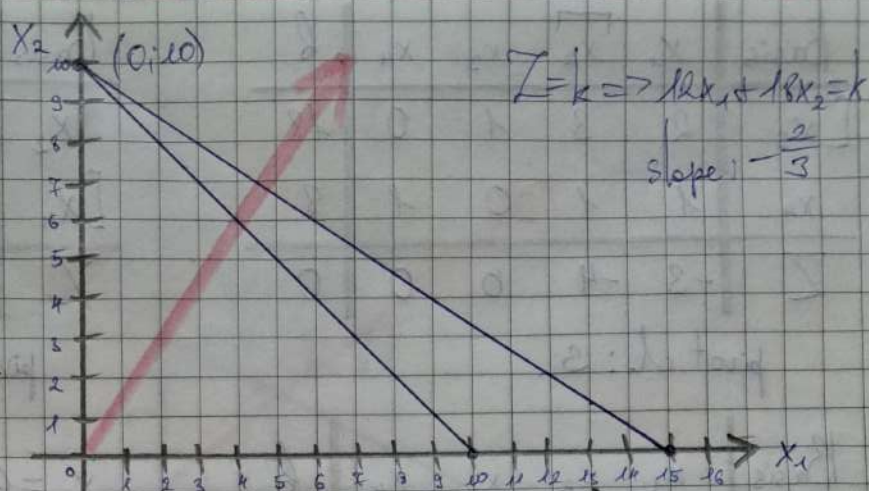
$$x_1 + x_2 \leq 10$$

$$2x_1 + 3x_2 \leq 30$$

$$x_1, x_2 \geq 0$$

$$x_1 + x_2 + x_3 = 10$$

$$2x_1 + 3x_2 + x_4 = 30$$



Basis	x_1	x_2	x_3	x_4	b
x_3	1	1	1	0	10
x_4	2	3	0	1	30
Z	-12	-18	0	0	0

Basis	x_1	x_2	x_3	x_4	b
x_2	1	1	1	0	10
x_1	-1	0	-3	1	0
Z	6	0	18	0	180

pivot el: 1.

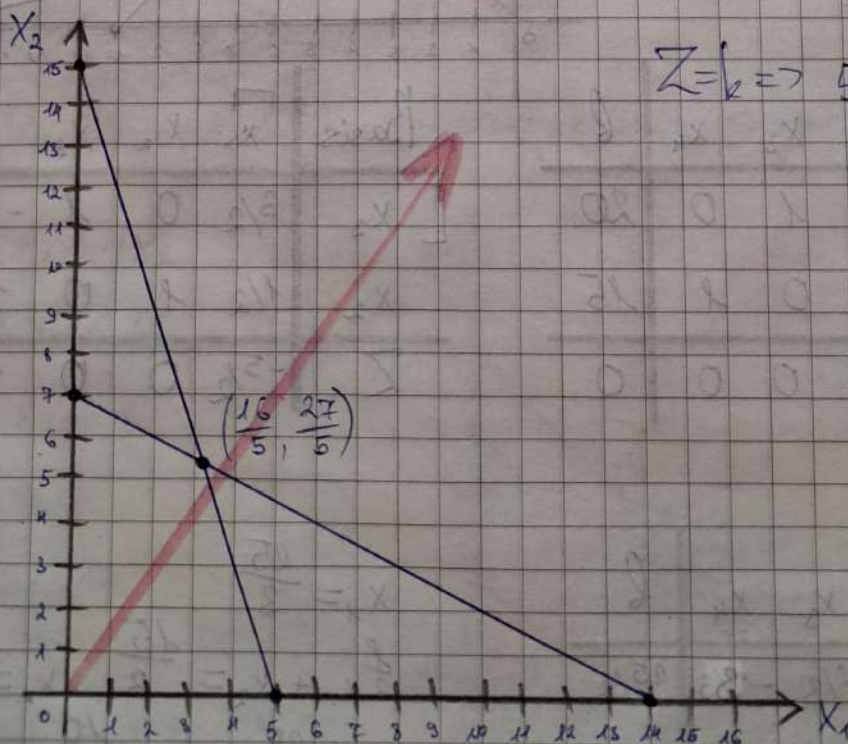
$$x_1 = 0$$

$$\Rightarrow 12 \cdot 0 + 18 \cdot 10 = 180.$$

$$x_1 + x_2 = 10, x_2 = 10$$

Optimal: $x_1 = 0; x_2 = 10; Z = 180.$

No 14.



$$N = 14. \quad Z = 5x_1 + 7x_2$$

$$x_1 + 2x_2 \leq 14$$

$$3x_1 + x_2 \leq 15$$

$$x_1, x_2 \geq 0$$

$$x_1 + 2x_2 + x_3 = 14$$

$$3x_1 + x_2 + x_4 = 15$$

Basis	x_1	x_2	x_3	x_4	b
x_3	1	2	1	0	14
x_4	3	1	0	1	15
Z	-5	-7	0	0	0

pivot el.: 2.

Basis	x_1	x_2	x_3	x_4	b
x_2	1/2	1	1/2	0	7
x_1	1	0	-1/5	2/5	16/5
Z	0	0	11/4	6/10	53,8

* успех: непрерывный успех

Basis	x_1	x_2	x_3	x_4	b
x_2	1/2	1	1/2	0	7
x_1	5/2	0	-1/2	1	8
Z	-3/2	0	7/2	0	49

pivot el.: $\frac{5}{2}$.

$$x_1 = 3,2$$

$$\frac{1}{2}x_1 + x_2 = 7, \quad x_2 = 5,4$$

$$5 \cdot 3,2 + 7 \cdot 5,4 = 16 + 37,8 = 53,8.$$

Результат: $x_1 = 3,2, x_2 = 5,4; Z = 53,8.$