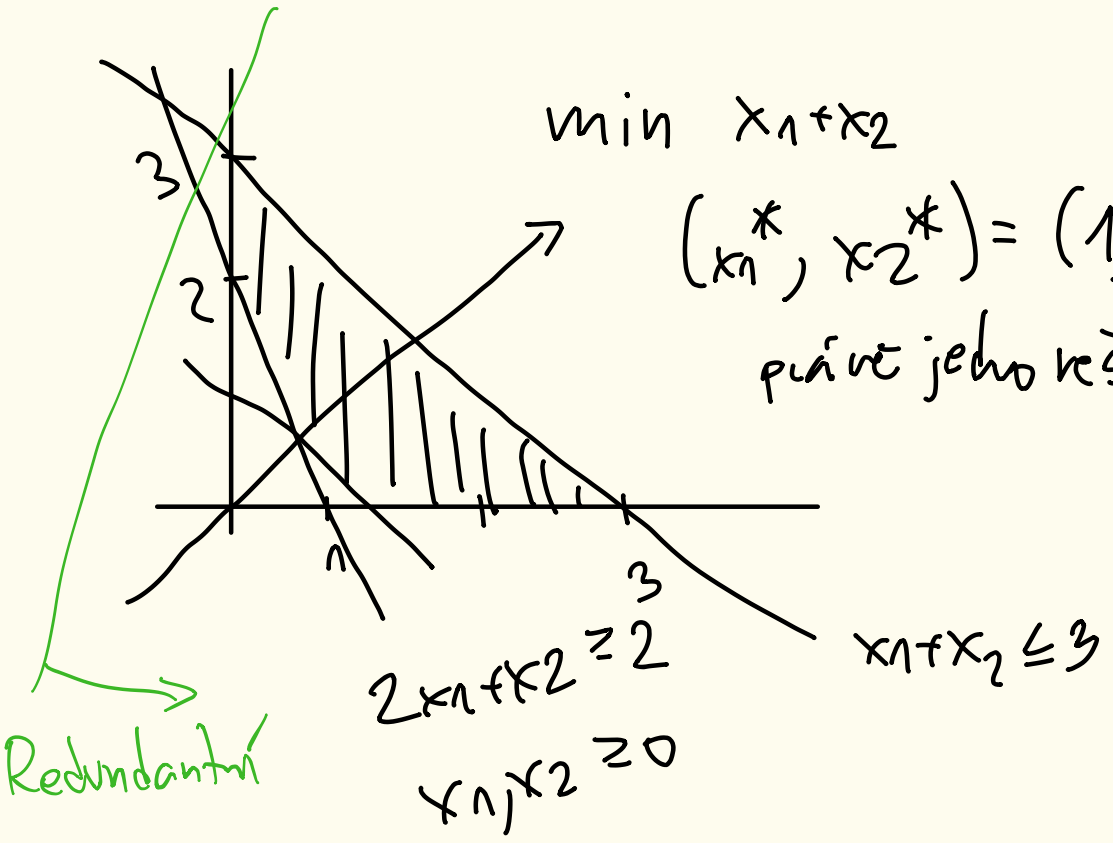
$2x_1 - 3x_2 \leq 3 \quad | \cdot(-1)$

$-2x_1 + 3x_2 \geq -3$

$x_1 - 2x_2 = 7$

$\geq$

$\leq$



$\min x_1 + x_2$

$(x_1^*, x_2^*) = (1, 0)$

právě jeho řeš.

$\min 2x_1 + x_2$

nekonečně mnoho řeš

$\max$ Z.P. $x_1 + x_2$

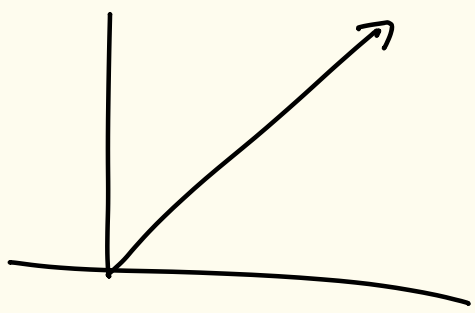
$x_1, x_2 \geq 0$

$x_1 - x_2 \leq 1$

$-2x_1 + x_2 \leq 2$

neomezená

$x_1 = x_2 = t \geq 0$



$\max 2t$

$4x_1 + x_2 \leq 4 \quad | \cdot 3$

$-x_1 + x_2 \leq 1 \quad | \cdot 2$ nepřípustná

$-2x_1 - x_2 \leq -3 \quad | \cdot 5$

$\max 3x_1 - 2x_2$

$0 \leq -1$

$\emptyset = P \subseteq \mathbb{R}^2$ $a \leq b \mid c > 0$

$ca \leq cb$

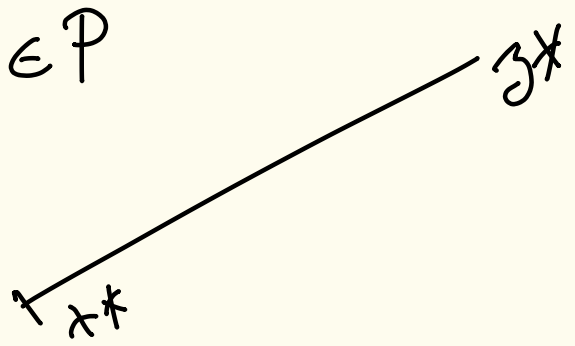
x^*, z^* optimální

$x^* \neq z^*$

f konvexní fce

$\min f(x)$

z.p. $x \in P$



$\max a^T x \Rightarrow \min -a^T x$

$\max 3x_1 - 2x_2$

z.p. $2x_1 - x_2 \leq 4 \quad x_1 \in \mathbb{R}$

$x_1 + 3x_2 \geq 5 \quad x_2 \geq 0$

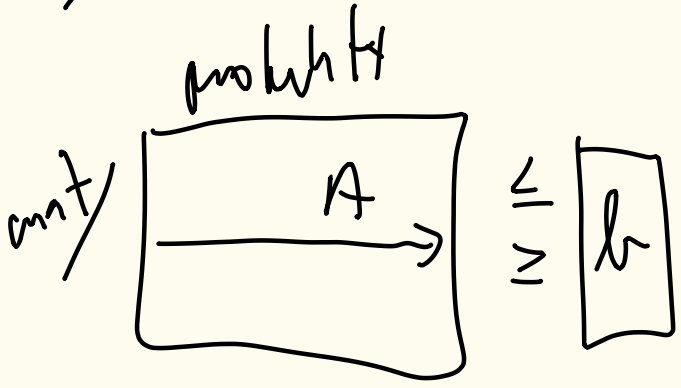
$\min 2x_2 - 3x_1$

$2x_1 - x_2 + y_1 = 4$

$-x_1 - 3x_2 + y_2 = -5$

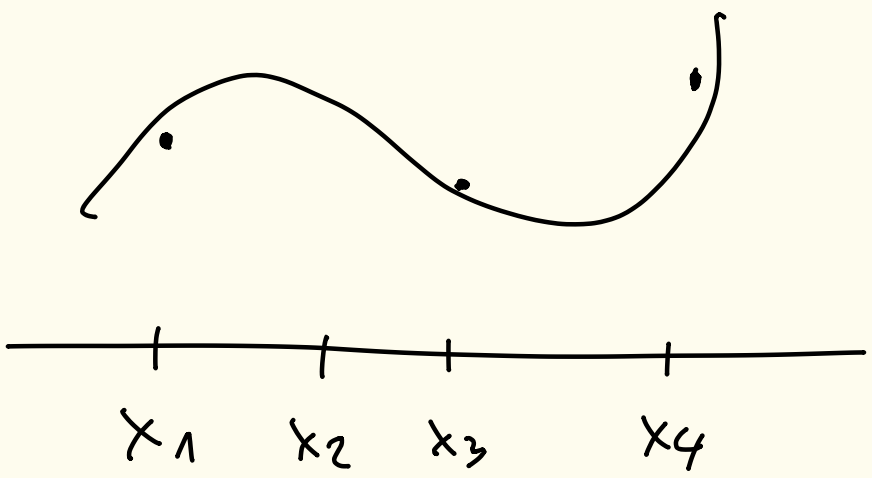
$z_1 - z_2 = x_1 \in \mathbb{R}, \; x_2 \geq 0, \; y_i \geq 0$

$\geq 0 \quad \geq 0$



error = 50

0,12



$\forall \alpha \in [0,1]$

$f((1-\alpha)x^* + \alpha y^*)$

$f(1-\alpha) f(x^*) + \alpha f(y^*)$

$= f(x^*) = f(y^*)$

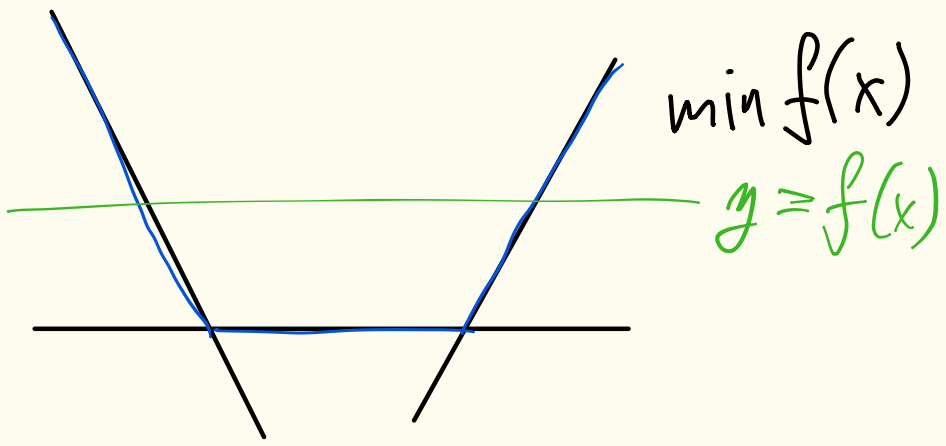
$A \in \mathbb{R}^{2 \times 5}$

$b \in \mathbb{R}^2$

$x \in (x_1, y_1, y_2, z_1, z_2)$

$Ax \approx b$

? $\|Ax - b\|_2 \to \min$



$$\min\{f(x) \mid x \in X\} =$$

$$= \min\{y \mid x \in X,\ y \geq f(x),\ (x,y) \in X \times \mathbb{R}\}$$

$$f(x) \leq y$$

$$\max_{i=1}^{k} (c^T x + d_i) \leq y$$

$$\max\{a_1, \dots, a_k\} \leq b$$

$$\Leftrightarrow$$

$$a_i \leq b \quad i = 1, \dots, k$$

$$\max_{i=1}^{m} |a_i^T x - b_i| \leq y$$

$$|a_i^T x - b_i| \leq y \quad i = 1, \dots, m$$

$$\max\{a_i^T x - b_i,\ b_i - a_i^T x\} \leq y$$

$$a_i^T x - b_i \leq y \qquad \sum_{i=1}^{m} |a_i^T x - b_i| \leq y_1 + \dots + y_m$$

$$\boxed{b_i - a_i^T x \leq y}$$

$$\min \quad \underbrace{\max\{3x + 4y + 1,\ 2x - 3y\}}_{\leq z}$$

$$\text{s.p.} \quad x + 2y \leq 14 \quad (1)$$

$$3x - y \geq 0 \quad (2)$$

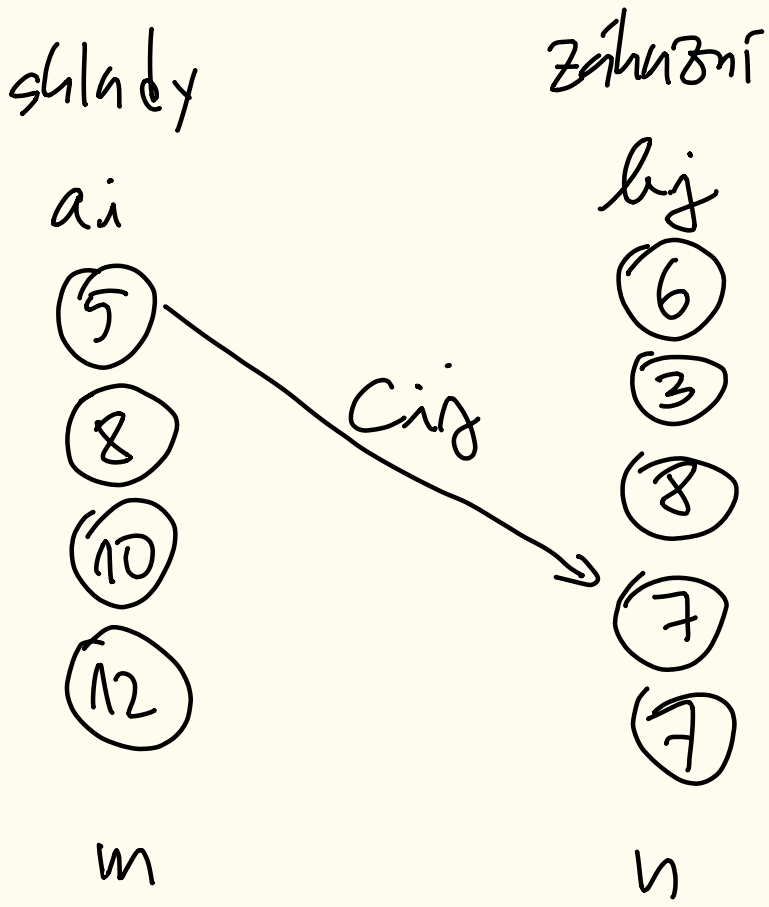
$$x - y \leq 2 \quad (3)$$

$$\min \quad z$$

$$\text{s.p.} \quad 3x + 4y - z \leq -1$$

$$2x - 3y - z \leq 0$$

$$(1), (2), (3)$$



$$\min \sum_{i=1}^{m} \sum_{j=1}^{n} c_{ij} x_{ij}$$

$$x_{ij} \geq 0$$

$$\text{z.p.} \quad \sum_{j=1}^{m} x_{ij} \leq a_i \quad \forall i$$

$$\sum_{i=1}^{n} x_{ij} \geq b_j \quad \forall j$$

R^{mn}

$$\sum_{i=1}^{m} a_i < \sum_{j=1}^{n} b_j \Rightarrow \text{nepřípustná}$$

					a_i	
5					5	x
1	3	4			8	x
		4	6		10	
			1	7	12	
b_j	6	3	8	7	7	

x x