

Lineární rovnice

$$\frac{6-4x}{2} = -x - (2+x)$$

100

$$\frac{y-4}{9} = \frac{5y-2}{6} - \frac{y-1}{3}$$

300

$$\frac{1}{x-2} - \frac{1}{x-3} = \frac{3x-10}{(2-x)(3-x)}$$

500

$$(x-1)^2 - (x+1)^2 + 6x = 5$$

Prémie
(700)

Lineární nerovnice

$$-2x + 3 \leq x$$

$$\frac{1-2x}{x+1} \geq 0$$

$$\frac{x+1}{1-x} \geq 1$$

Rovnice s neznámou ve jmenovateli

$$\frac{2}{x} - \frac{3}{x+2} = \frac{1}{x}$$

100

$$\frac{(2n-1)^2}{n-1} = 4n + \frac{1}{n-1}$$

200

$$\frac{2}{x+3} - \frac{3}{3-x} = \frac{x}{x^2-9}$$

400

$$\frac{(x-5)(x+5)}{25-x^2} = 0$$

Prémie
(500)

Soustavy rovnic

$$2x - 3y = 6$$

$$x - 2y = 4$$

$$\frac{x}{2} + \frac{y}{3} = 2$$

$$\frac{x}{4} - \frac{y}{2} = 3$$

$$\frac{x+1}{3} - \frac{y+2}{4} = \frac{2(x-y)}{5}$$

$$\frac{x-3}{4} - \frac{y-3}{3} = 2y - x$$

$$5 \cdot (x+3) - 12 \cdot (y-2) = 7$$

$$3 \cdot (x-y) - 2 \cdot (4x+7y) = 3$$

Lineární rovnice

$$\frac{6-4x}{2} = -x - (2+x)$$

$$x \in \emptyset$$

$$\frac{y-4}{9} = \frac{5y-2}{6} - \frac{y-1}{3}$$
$$y = -\frac{8}{7}$$

$$\frac{1}{x-2} - \frac{1}{x-3} = \frac{3x-10}{(2-x)(3-x)}$$

$$x \in \emptyset$$

$$(x-1)^2 - (x+1)^2 + 6x = 5$$

$$x = 2,5$$

100

300

500

Prémie
(700)

Lineární nerovnice

$$-2x + 3 \leq x \quad \underline{\underline{K = \langle 1; \infty \rangle}}$$

$$\frac{1-2x}{x+1} \geq 0 \quad \underline{\underline{K = \left(-1; \frac{1}{2} \right)}}$$

$$\frac{x+1}{1-x} \geq 1 \quad \underline{\underline{K = \langle 0; 1 \rangle}}$$

Rovnice s neznámou ve jmenovateli

$$\frac{2}{x} - \frac{3}{x+2} = \frac{1}{x}$$

$$x = 1$$

$$\frac{(2n-1)^2}{n-1} = 4n + \frac{1}{n-1}$$

$$n \in \mathbb{R} - \{1\}$$

$$\frac{2}{x+3} - \frac{3}{3-x} = \frac{x}{x^2-9}$$

$$x = -\frac{3}{4}$$

$$\frac{(x-5)(x+5)}{25-x^2} = 0$$

$$\underline{\underline{x \in \emptyset}}$$

Soustavy rovnic

100

$$2x - 3y = 6$$

$$x - 2y = 4$$

$$[0, -2]$$

300

$$\frac{x}{2} + \frac{y}{3} = 2$$

$$\frac{x}{4} - \frac{y}{2} = 3$$

$$[6, -3]$$

500

$$\frac{x+1}{3} - \frac{y+2}{4} = \frac{2(x-y)}{5}$$

$$\frac{x-3}{4} - \frac{y-3}{3} = 2y - x$$

$$[11, 6]$$

Prémie
(700)

$$5 \cdot (x+3) - 12 \cdot (y-2) = 7$$

$$3 \cdot (x-y) - 2 \cdot (4x+7y) = 3$$

$$[-4, 1]$$

Lineární rovnice za 100

Řeš rovnici v R: $\frac{6-4x}{2} = -x - (2+x)$

$$3 - 2x = -x - 2 - x$$

$$3 - 2x = -2x - 2 \quad /+ 2x \quad /- 3$$

$$-2x + 2x = -2 - 3$$

$$0x \neq -5$$

$$x \in \emptyset$$

Lineární rovnice za 300

Řeš rovnici v Z:
$$\frac{y-4}{9} = \frac{5y-2}{6} - \frac{y-1}{3}$$

$$\frac{y-4}{9} = \frac{5y-2}{6} - \frac{y-1}{3} \quad / \cdot 18$$

$$2y - 8 = 15y - 6 - 6y + 6$$

$$2y - 8 = 9y \quad / - 9y \quad / + 8$$

$$-7y = 8 \quad / : (-7)$$

$$y = -\frac{8}{7} = -1\frac{1}{7}$$

$$y \in \emptyset$$

Lineární rovnice za 500

Řeš rovnici v R:
$$\frac{1}{x-2} - \frac{1}{x-3} = \frac{3x-10}{(2-x)(3-x)}$$

$$\frac{1}{x-2} - \frac{1}{x-3} = \frac{3x-10}{(2-x)(3-x)}$$

$$-\frac{1}{2-x} + \frac{1}{3-x} = \frac{3x-10}{(2-x)(3-x)}$$

$$-3 + x + 2 - x = 3x - 10$$

$$-1 = 3x - 10$$

$$-3x = -9$$

$$x = 3$$

$$\cdot (2-x)(3-x)$$

$$/-3x \quad /+1$$

$$/:(-3)$$

Podmínky:

$$x - 2 \neq 0$$

$$x \neq 2$$

$$x - 3 \neq 0$$

$$x \neq 3$$

$$x \in \emptyset$$

Lineární rovnice – prémie

Řeš rovnici v \mathbb{R} : $(x-1)^2 - (x+1)^2 + 6x = 5$

$$x^2 - 2x + 1 - (x^2 + 2x + 1) + 6x = 5$$

$$x^2 - 2x + 1 - x^2 - 2x - 1 + 6x = 5$$

$$2x = 5 \quad / : 2$$

$$x = 2,5$$

Zkouška: $P = 5$

$$\begin{aligned} L &= (2,5 - 1)^2 - (2,5 + 1)^2 + 6 \cdot 2,5 = 1,5^2 - 3,5^2 + 15 = \\ &= 2,25 - 12,25 + 15 = 5 \end{aligned}$$

$$L = P$$

Nerovnice za 100

Řeš v \mathbb{R} nerovnici:

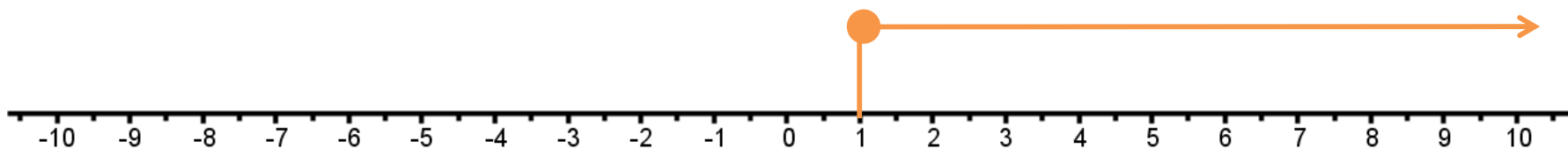
$$-2x + 3 \leq x$$

$$-2x + 3 \leq x$$

$$-2x - x \leq -3$$

$$-3x \leq -3$$

$$x \geq 1$$



$$\underline{\underline{K = \langle 1; \infty \rangle}}$$

Nerovnice za 300

$$\frac{1-2x}{x+1} \geq 0$$

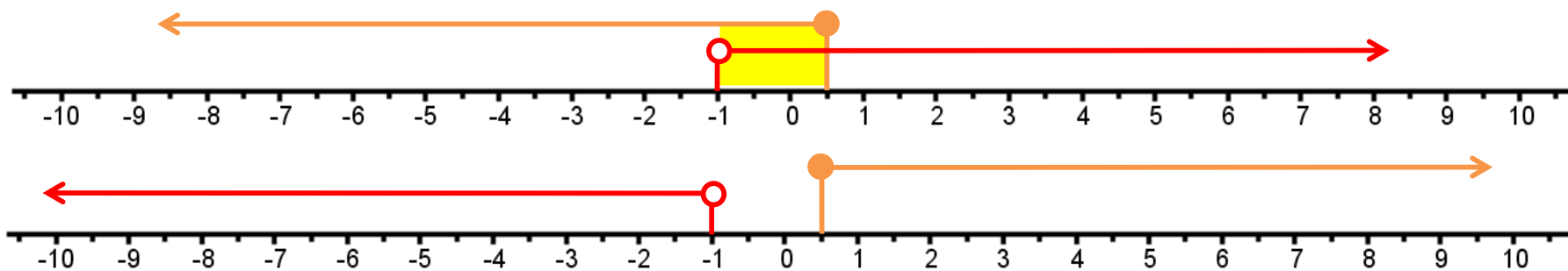
Vyřeš v \mathbb{R} nerovnici:

$$\frac{1-2x}{x+1} \geq 0$$

$$(1-2x \geq 0 \wedge x+1 > 0) \vee (1-2x \leq 0 \wedge x+1 < 0)$$

$$(-2x \geq -1 \wedge x > -1) \vee (-2x \leq -1 \wedge x < -1)$$

$$\left(x \leq \frac{1}{2} \wedge x > -1\right) \vee \left(x \geq \frac{1}{2} \wedge x < -1\right)$$



$$\underline{\underline{K = \left(-1; \frac{1}{2}\right)}}$$

Nerovnice – prémie

$$\frac{x+1}{1-x} \geq 1$$

Vyřeš v \mathbb{R} nerovnici:

$$\frac{x+1}{1-x} - 1 \geq 0$$

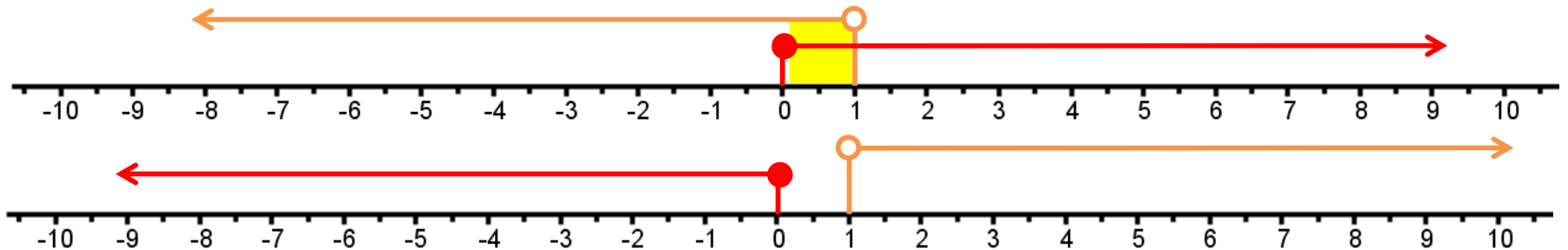
$$\frac{x+1-1+x}{1-x} \geq 0$$

$$\frac{2x}{1-x} \geq 0$$

$$(2x \geq 0 \wedge 1-x > 0) \vee (2x \leq 0 \wedge 1-x < 0)$$

$$(x \geq 0 \wedge -x > -1) \vee (x \leq 0 \wedge -x < -1)$$

$$(x \geq 0 \wedge x < 1) \vee (x \leq 0 \wedge x > 1)$$



$$\underline{\underline{K = \langle 0; 1 \rangle}}$$

Rovnice s neznámou ve jmenovateli za 100

Řeš rovnici v R: $\frac{2}{x} - \frac{3}{x+2} = \frac{1}{x}$

$$\frac{2}{x} - \frac{3}{x+2} = \frac{1}{x} \quad / x \cdot (x+2)$$

$$2 \cdot (x+2) - 3 \cdot x = x+2$$

$$2x+4-3x = x+2$$

$$-x+4 = x+2 \quad / -x \quad / -4$$

$$-x-x = 2-4$$

$$-2x = -2 \quad / :(-2)$$

$$x = 1$$

Zkouška: $L = \frac{2}{1} - \frac{3}{1+2} = 2 - 1 = 1$

$$P = \frac{1}{1} = 1 \quad \dots \quad L = P$$

Podmínky:

$$x \neq 0$$

\wedge

$$x+2 \neq 0$$

$$x \neq -2$$

Rovnice s neznámou ve jmenovateli za 300

Řeš v R rovnici:
$$\frac{(2n-1)^2}{n-1} = 4n + \frac{1}{n-1}$$

$$\frac{(2n-1)^2}{n-1} = 4n + \frac{1}{n-1} \quad / \cdot (n-1)$$

$$(2n-1)^2 = 4n \cdot (n-1) + 1$$

$$4n^2 - 4n + 1 = 4n^2 - 4n + 1$$

$$0n = 0$$

Podmínky:

$$n-1 \neq 0$$

$$n \neq 1$$

$$n \in R - \{1\}$$

Rovnice s neznámou ve jmenovateli za 500

Řeš rovnici v R:
$$\frac{2}{x+3} - \frac{3}{3-x} = \frac{x}{x^2-9}$$

$$\frac{2}{x+3} - \frac{3}{3-x} = \frac{x}{x^2-9}$$

$$\frac{2}{x+3} + \frac{3}{x-3} = \frac{x}{(x+3)(x-3)} \quad / \cdot (x+3)(x-3)$$

$$2 \cdot (x-3) + 3 \cdot (x+3) = x$$

$$2x - 6 + 3x + 9 = x$$

$$5x + 3 = x \quad / -x \quad / -3$$

$$5x - x = -3$$

$$4x = -3 \quad / :4$$

$$x = -\frac{3}{4}$$

Podmínky:

$$x + 3 \neq 0$$

$$x \neq -3$$

∧

$$x - 3 \neq 0$$

$$x \neq 3$$

$$\text{Zkouška: } L = \frac{2}{-\frac{3}{4}+3} - \frac{3}{3-\left(-\frac{3}{4}\right)} = \frac{2}{-\frac{3}{4}+\frac{12}{4}} - \frac{3}{\frac{12}{4}+\frac{3}{4}} = \frac{2}{\frac{9}{4}} - \frac{3}{\frac{15}{4}} = \frac{8}{9} - \frac{12}{15} = \frac{8}{9} - \frac{4}{5} = \frac{40-36}{45} = \frac{4}{45}$$

$$P = \frac{-\frac{3}{4}}{\left(-\frac{3}{4}\right)^2 - 9} = \frac{-\frac{3}{4}}{\frac{9}{16} - 9} = \frac{-\frac{3}{4}}{\frac{9}{16} - \frac{144}{16}} = \frac{-\frac{3}{4}}{-\frac{135}{16}} = \frac{3 \cdot 16}{4 \cdot 135} = \frac{4}{45} \quad \dots \quad L = P$$

Rovnice s neznámou ve jmenovateli – prémie

Vyřeš rovnici v R:

$$\frac{(x-5)(x+5)}{25-x^2} = 0$$

$$\frac{(x-5)(x+5)}{25-x^2} = 0$$

$$\frac{(x-5)(x+5)}{(5-x)(5+x)} = 0$$

$$\frac{-1(5-x)(x+5)}{(5-x)(5+x)} = 0$$

$$-1 \neq 0$$

$$\underline{\underline{x \in \emptyset}}$$

Podmínky:

$$5-x \neq 0$$

$$x \neq 5$$

\wedge

$$5+x \neq 0$$

$$x \neq -5$$

Soustava rovnic za 100

$$2x - 3y = 6$$

Řeš v R soustavu rovnic: $x - 2y = 4$

$$2x - 3y = 6$$

$$\underline{x - 2y = 4} \quad / \cdot (-2)$$

$$2x - 3y = 6$$

$$\underline{-2x + 4y = -8}$$

$$\underline{\underline{y = -2}}$$

$$x - 2 \cdot (-2) = 4$$

$$x + 4 = 4$$

$$\underline{\underline{x = 0}}$$

Zkouška:

$$L_1 = 2 \cdot 0 - 3 \cdot (-2) = 0 + 6 = 6$$

$$P_1 = 6 \quad \dots \quad L_1 = P_1$$

$$L_2 = 0 - 2 \cdot (-2) = 0 + 4 = 4$$

$$P_2 = 4 \quad \dots \quad L_2 = P_2$$

Soustava rovnic za 300

Řeš v R soustavu rovnic:

$$\frac{x}{2} + \frac{y}{3} = 2; \quad \frac{x}{4} - \frac{y}{2} = 3$$

$$\frac{x}{2} + \frac{y}{3} = 2 \quad / \cdot 6$$

$$\frac{x}{4} - \frac{y}{2} = 3 \quad / \cdot 4$$

$$3x + 2y = 12$$

$$\underline{x - 2y = 12}$$

$$4x = 24$$

$$\underline{\underline{x = 6}}$$

$$6 - 2y = 12 \quad / -6$$

$$-2y = 6 \quad / : (-2)$$

$$\underline{\underline{y = -3}}$$

$$\text{Zkouška: } L_1 = \frac{6}{2} + \frac{-3}{3} = 3 - 1 = 2$$

$$P_1 = 2 \quad \dots \quad L_1 = P_1$$

$$L_2 = \frac{6}{4} - \frac{-3}{2} = 1,5 + 1,5 = 3$$

$$P_2 = 3 \quad \dots \quad L_2 = P_2$$

Soustava rovnic za 500

Řeš v R soustavu rovnic: $\frac{x+1}{3} - \frac{y+2}{4} = \frac{2(x-y)}{5}$; $\frac{x-3}{4} - \frac{y-3}{3} = 2y-x$

$$\frac{x+1}{3} - \frac{y+2}{4} = \frac{2(x-y)}{5} \quad / \cdot 60$$

$$\frac{x-3}{4} - \frac{y-3}{3} = 2y-x \quad / \cdot 12$$

$$20x + 20 - 15y - 30 = 24x - 24y$$

$$3x - 9 - 4y + 12 = 24y - 12x$$

$$-4x + 9y = 10 \quad / \cdot 15$$

$$15x - 28y = -3 \quad / \cdot 4$$

$$-60x + 135y = 150$$

$$60x - 112y = -12$$

$$23y = 138$$

$$\underline{\underline{y = 6}}$$

$$-4x + 9 \cdot 6 = 10$$

$$-4x = -44$$

$$\underline{\underline{x = 11}}$$

$$\text{Zkouška: } L_1 = \frac{11+1}{3} - \frac{6+2}{4} = \frac{12}{3} - \frac{8}{4} = 4 - 2 = 2$$

$$P_1 = \frac{2 \cdot (11-6)}{5} = \frac{2 \cdot 5}{5} = \frac{10}{5} = 2 \quad \dots \quad L_1 = P_1$$

$$L_2 = \frac{11-3}{4} - \frac{6-3}{3} = \frac{8}{4} - \frac{3}{3} = 2 - 1 = 1$$

$$P_2 = 2 \cdot 6 - 11 = 1 \quad \dots \quad L_2 = P_2$$

Soustava rovnic – prémie

$$5 \cdot (x + 3) - 12 \cdot (y - 2) = 7$$

Řeš v R soustavu rovnic: $3 \cdot (x - y) - 2 \cdot (4x + 7y) = 3$

$$5 \cdot (x + 3) - 12 \cdot (y - 2) = 7$$

$$3 \cdot (x - y) - 2 \cdot (4x + 7y) = 3$$

$$5x + 15 - 12y + 24 = 7$$

$$3x - 3y - 8x - 14y = 3$$

$$5x - 12y = -32$$

$$-5x - 17y = 3$$

$$-29y = -29$$

$$\underline{\underline{y = 1}}$$

$$5x - 12 \cdot 1 = -32$$

$$5x = -32 + 12$$

$$5x = -20$$

$$\underline{\underline{x = -4}}$$

Zkouška:

$$\begin{aligned} L_1 &= 5 \cdot (-4 + 3) - 12 \cdot (1 - 2) = \\ &= 5 \cdot (-1) - 12 \cdot (-1) = -5 + 12 = 7 \end{aligned}$$

$$P_1 = 7 \quad \dots \quad L_1 = P_1$$

$$\begin{aligned} L_2 &= 3 \cdot (-4 - 1) - 2 \cdot [4 \cdot (-4) + 7 \cdot 1] = \\ &= 3 \cdot (-5) - 2 \cdot (-16 + 7) = -15 - 2 \cdot (-9) = \\ &= -15 + 18 = 3 \end{aligned}$$

$$P_2 = 3 \quad \dots \quad L_2 = P_2$$