IRACIONÁLNÍ ROVNICE

9.1 $K = \{6\}$ $D = \langle \frac{2}{3}; \infty)$

9.2 $K = \{2\}$ $D = \langle 1; \infty)$

9.3 $K = \{3\}$ $D = \langle -1; 4 \rangle$

9.4. $K = \{4\}$ $D = \langle 3; \infty)$

9.5 $K = \{-1\}$ $D = \langle -1; \infty)$

$x+1 \geq 0 \quad x+2 \geq 0$

$x \geq -1 \quad x \geq -2$

$4x+5 \geq 0$

$x \geq -\frac{5}{4}$ $\quad D = \langle -1; \infty)$

9.5 $\sqrt{x+1} + \sqrt{x+2} = \sqrt{4x+5}$

$x+1+2\cdot\sqrt{x+1}\sqrt{x+2}+x+2 = 4x+5$

$2\cdot\sqrt{x+1}\sqrt{x+2} = 2x+2$

$\sqrt{x+1}\sqrt{x+2} = x+1$

$(x+1)(x+2) = x^2+2x+1$

$x^2+2x+x+2 = x^2+2x+1$

$x = -1$

$K = \{-1\}$

Zk: $L = \sqrt{-1+1} + \sqrt{-1+2} = \sqrt{0} + \sqrt{1} = 1$

$P: \sqrt{4\cdot(-1)+5} = \sqrt{1} = 1$

$L = P$.

$3 > 2$

Ekvi:

$9 > 4$

$0{,}5 < 0{,}8$

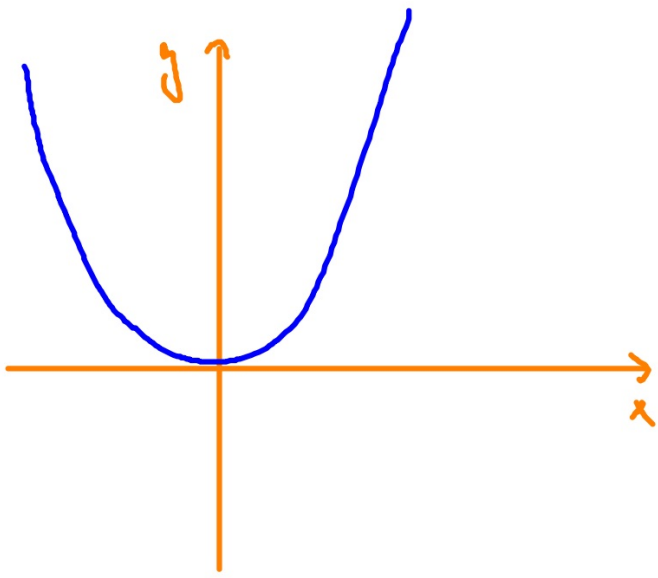
Ekvi:

$0{,}25 < 0{,}64$

$-3 < 2$

BLBĚ:

$9 < 4$



IRACIONÁLNÍ NEROVNICE

10.1 $K = \langle -15; 10 \rangle$ $D = \langle -15; \infty)$

10.2. $K = \langle 6; \infty)$ $D = \langle \frac{2}{3}; \infty)$

10.3 $K = \langle -35; 14 \rangle$ $D = \langle -35; \infty)$

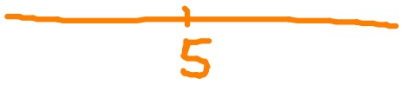
10.4. $K = \langle 8; \infty)$ $D = \langle -\frac{1}{3}; \infty)$

$\sqrt{x+15} \geqq x-5$

$x+15 \geqq 0$

$x \geqq -15$

$D = \langle -15; \infty)$



a) pro $x \in \langle -15; 5)$

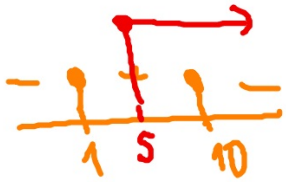
$L \geqq 0 \quad P < 0 \Rightarrow K_1 = \langle -15; 5)$

b) pro $x \in \langle 5; \infty)$

$L \geqq 0 \quad P \geqq 0 \Rightarrow$ lze umocnit

$x+15 \geqq x^2 - 10x + 25$

$x^2 - 11x + 10 \leqq 0$



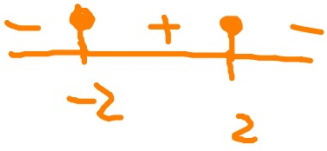
$K_2 = \langle 5; 10 \rangle$

$K = \langle -15; 10 \rangle$

10.5 $\sqrt{4-x^2} \leqq x$ $\quad K = \langle \sqrt{2}; 2 \rangle$

$4 - x^2 \geq 0$

$(2-x)(2+x) \geq 0$

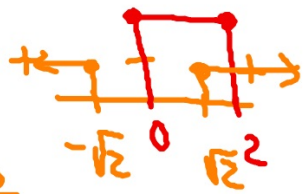


$D = \langle -2; 2 \rangle$

a) $x \in \langle -2; 0)$

$L \geq 0$
$P < 0$
$\Big\}$ $K_1 = \emptyset$

b) $x \in \langle 0, 2 \rangle$



$L \geq 0$
$P \geq 0$

$4 - x^2 \leqq x^2$

$2(2 - x^2) \leqq 0$ $\quad K_2 = \langle \sqrt{2}; 2 \rangle$

$2(\sqrt{2} - x)(\sqrt{2} + x) \leq 0$

SOUSTAVY ROVNIC

10.1 $K = \{[4; 2; 3]\}$

10.2 $K = \{[1; 2; 3; 4]\}$

10.3 $K = \{[2; -1]; [4; 1]\}$

11.1. Gaussova eliminační metoda

$$x+y-z=3 \quad (1)$$
$$x-3y+z=1 \quad (2)$$
$$x-y-2z=-4 \quad (3)$$

(1) $x+y-z=3$ (1)

(2)-(1) $-4y+2z=-2$ (2)

(3)-(1) $-2y-z=-7$ (3)

(1) $x+y-z=3 \Rightarrow x=4$

$-\frac{1}{2}\cdot$(2) $2y-z=1 \Rightarrow y=2$

2.(3)-(2) $-4z=-8 \Rightarrow z=3$

$K=\{[4;2;3]\}$

$$
\begin{array}{lll}
2a+b+c+d=11 & (1) & (1)\ a+3b-c-d=0 \\
a+3b-c-d=0 & (2) & (2)\ -10b+c+2d=-9 \\
a-5b-c+2d=-4 & (3) & (3)\ 5c+4d=31 \\
3a-b-2c-d=-9 & (4) & 5(4)+1(3)\ \ 51d=204
\end{array}
$$

$$
\begin{array}{lll}
(2)\ a+3b-c-d=0 & (1) & \Rightarrow a=1 \\
(1)-2(2)\ -5b+3c+3d=11 & (2) & \Rightarrow b=2 \\
(3)-(2)\ -8b+3d=-4 & (2) & \Rightarrow c=3 \\
(4)-3(2)\ -10b+c+2d=-9 & (4) & \Rightarrow d=4
\end{array}
$$

$$
\begin{array}{lll}
(1)\ a+3b-c-d=0 & (1) & L=\{[1,2,3,4]\} \\
(4)\ -10b+c+2d=-9 & (2) & \\
(2)-(4)\ 5c+4d=31 & (3) & \\
5(3)-4(4)\ -4c+7d=16 & (4) &
\end{array}
$$

11.4.

$$4x - p \cdot y = p - 2 \qquad \Rightarrow x = \frac{p-2+py}{4}$$
$$p \cdot x - 9y = p$$

$$p \cdot \frac{p-2+py}{4} - 9y = p$$

$$p^2 - 2p + p^2 y - 36y = 4p$$

$$y(p^2 - 36) = -p^2 + 6p$$

$$y(p-6)\cdot(p+6) = -p(p-6)$$

a) pro $p = -6$

$0 = -72$

$K_1 = \emptyset$

b) pro $p = 6$

$0 = 0$

c) pro $p \neq \pm 6$

$y = -\frac{p}{p+6}$

$x = \frac{p-2+py}{4} = \frac{p-2-\frac{p^2}{p+6}}{4} =$

$= \frac{p^2+6p-2p-12-p^2}{4(p+6)} =$

$= \frac{4(p-3)}{4(p+6)} = \frac{p-3}{p+6}$

$K_2 = \{[1+\frac{3}{2}y; y]; y \in R\}$

$\{[x; \frac{2}{3}(x-1)]; x \in R\}$

$K_3 = \{[\frac{p-3}{p+6}; \frac{-p}{p+6}]\}$

pro $p = -6$ je $K = \emptyset$

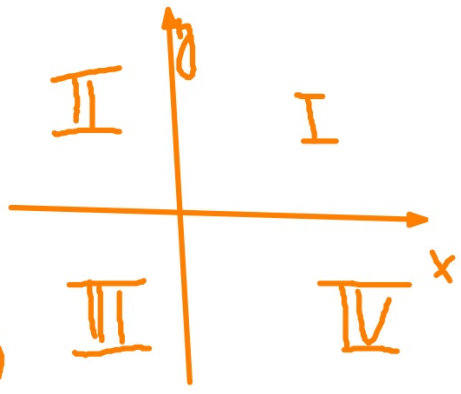
pro $p = 6$ je $K = \left\{ \left[1 + \frac{3}{2}y ; y \right] ; y \in R \right\}$

pro $p \neq -6 \wedge p \neq 6$ je $K = \left\{ \left[\frac{p-3}{p+6} ; \frac{-p}{p+6} \right] \right\}$

11.5.

ve II. kvadrantu

$x \leq 0 \wedge y \geq 0$



$$x + 2y = \mu$$
$$2x + y = 1 \quad \Rightarrow y = 1 - 2x$$

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

$$y = 1 - 2x = 1 - \frac{4-2\mu}{3} = \frac{-1+2\mu}{3}$$

$$K = \left\{\left[\frac{2-\mu}{3}; \frac{-1+2\mu}{3}\right]\right\}$$

ve II. kvadrantu

$x \leq 0 \Rightarrow \frac{2-\mu}{3} \leq 0$

$2 \leq \mu$

$y \geq 0 \Rightarrow \frac{-1+2\mu}{3} \geq 0$

$\mu \geq \frac{1}{2}$

$\mu \in \langle 2; \infty)$

12. SOUSTAVY NEROVNIC

12.1. $K = \langle -6; -1)$

12.2. $K = \langle \frac{3}{2}; \frac{7}{2})$

12.3. $K = \langle 2; 6)$

12.4. $K = (\frac{1}{3}; 2\rangle$

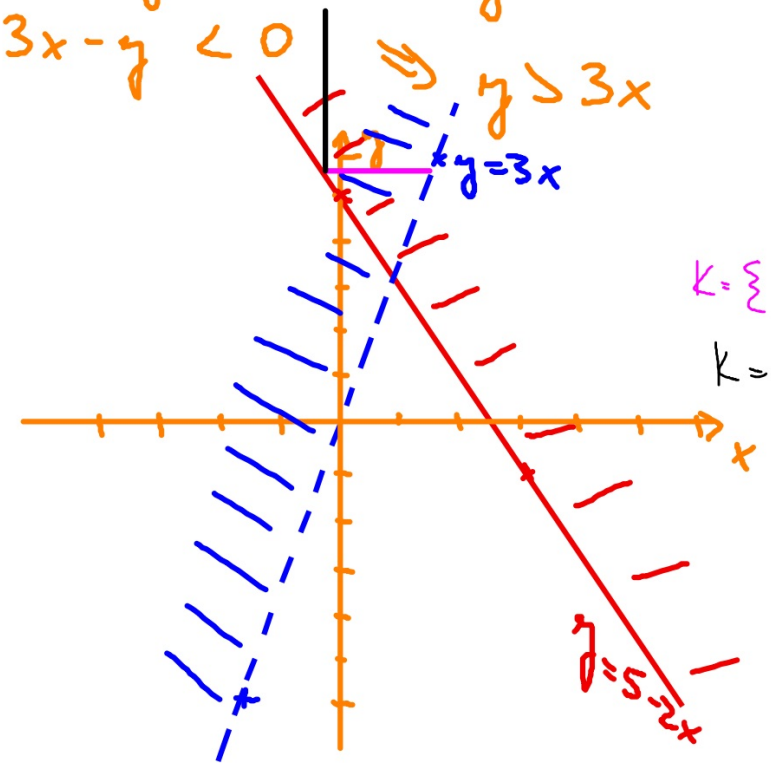
12.5. Řešte graficky soustavu

$2x + y \geq 5 \Rightarrow y \geq 5 - 2x$

$3x - y < 0 \Rightarrow y > 3x$

x	0	3
y	5	-1

x	-2	2
y	-6	6



$K = \{ [\langle \frac{5-y}{2}; \frac{y}{3}); y]; \ y \geq 3 \}$

$K = \{ [x; \langle 5-2x; \infty)]; \ x < 1$

$[x; (3x; \infty)]; \ x \geq 1 \ \}$

$$K = \left\{ \left[\left\langle \frac{5-y}{2} ; \frac{y}{3} \right) ; y \right] ; \; y \geq 3 \right\}$$

$$K = \left\{ \left[x ; \left\langle 5-2x ; \infty \right) \right] ; x < 1 \right.$$

$$\left. \left[x ; (3x ; \infty) \right] ; \; x \geq 1 \right\}$$