

Neznámá pod odmocninou

$$\sqrt{x+1} = 2 \quad |^2$$

$$x+1 = 4$$

$$\underline{x = 3}$$

$$\sqrt{x+1} = -2 \quad |^2$$

$$x+1 = 4$$

$$\underline{x = 3}$$

NEEKVIVALENTNÍ

ZKOUŠKA

$$zk: L: \sqrt{3+1} = \sqrt{4} = 2$$

$$P: 2$$

$$L = P$$

$$K = \{3\}$$

$$zk: L: \sqrt{3+1} = \sqrt{4} = 2$$

$$P: -2$$

$$L \neq P$$

$$K = \{\}$$

2 1-8:14

$$\sqrt{x-2} = x-4 \quad |^2$$

$$x-2 = x^2 - 8x + 16$$

$$0 = x^2 - 9x + 18$$

$$0 = (x-6)(x-3)$$

podezřelí z kořene:

$$x_1 = 6$$

$$\cancel{x_2 = 3}$$

$$\underline{K = \{6\}}$$

$$zk(6): L: \sqrt{6-2} = 2$$

$$P: 6-4 = 2$$

$$\underline{L = P}$$

$$zk(3): L: \sqrt{3-2} = 1$$

$$P: 3-4 = -1$$

$$\underline{L \neq P}$$

2 1-8:17

$$\sqrt{2x-5} = \sqrt{1-x} \quad |^2$$

$$2x-5 = 1-x$$

$$3x = 6$$

$$\underline{x=2}$$

$$zk: L: \sqrt{4-5} = \sqrt{-1} \quad \text{Ne/žp}$$

$$K = \{\}$$

2 1-8:31

$$-\sqrt{10+x-x^2} = 1-x \quad |^2$$

$$10+x-x^2 = 1-2x+x^2$$

$$0 = 2x^2 - 3x - 9$$

$$x_{1,2} = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \cdot 2 \cdot (-9)}}{2 \cdot 2}$$

$$x_1 = 3$$

$$x_2 = -\frac{3}{2}$$

$$zk: \begin{matrix} L = -2 \\ P = -2 \end{matrix} \quad L=P$$

$$zk: \begin{matrix} L = -\frac{5}{2} \\ P = +\frac{5}{2} \end{matrix} \quad L \neq P$$

$$\underline{\underline{K = \{3\}}}$$

2 1-8:33

$$167/6.15$$

2 1-8:42

$$\begin{aligned}
 2\sqrt{x-1} - \sqrt{x+4} &= 1 \quad |^2 \\
 4(x-1) - 4\sqrt{(x-1)(x+4)} + (x+4) &= 1 \\
 5x-1 - 4\sqrt{x^2+3x-4} &= 0 \\
 5x-1 &= 4\sqrt{(x-1)(x+4)} \quad |^2 \\
 25x^2 - 10x + 1 &= 16(x^2 + 3x - 4) \\
 9x^2 - 58x + 65 &= 0 \\
 x_{1,2} &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\
 x_1 &= 5 \\
 x_2 &= \frac{13}{9}
 \end{aligned}$$

2 2-9:06

$$2\sqrt{x-1} - \sqrt{x+4} = 1$$

$$\text{Zk.: } L(5) = 2\sqrt{5-1} - \sqrt{5+4} = \underline{1}$$

$$P(5) = \underline{1}$$

$$\underline{L = P}$$

$$L\left(\frac{13}{9}\right) = 2\sqrt{\frac{13-9}{9}} - \sqrt{\frac{13+9}{9}} =$$

$$= \underline{-1}$$

$$P\left(\frac{13}{9}\right) = \underline{1}$$

$$\underline{L \neq P}$$

$$K = \{5\}$$

2 2-9:19

$$\sqrt{y+4} + 3\sqrt{y} = 7 \quad |^2$$

$$y+4 + 6\sqrt{y(y+4)} + 9y = 49$$

$$10y - 45 = -6\sqrt{y(y+4)} \quad |^2$$

$$100y^2 - 900y + 2025 = 36y^2 + 144y$$

$$64y^2 - 1044y + 2025 = 0$$

$$y_{1,2} = < \quad \text{D.Ú.}$$

2 2-9:22

$$\sqrt{y+2} + 2\sqrt{y-1} = 4 \quad |^2$$

$$y+2 + 4\sqrt{(y+2)(y-1)} + 4(y-1) = 16$$

$$5y - 18 = -4\sqrt{y^2 + y - 2} \quad |^2$$

$$25y^2 - 180y + 324 = 16y^2 + 16y - 32$$

$$9y^2 - 196y + 356 = 0$$

22. D.Ú.

$$K = D.Ú.$$

$$y_{1,2} = \frac{196 \pm \sqrt{196^2 - 4 \cdot 9 \cdot 356}}{2 \cdot 9}$$

$$y_1 = \frac{178}{9}$$

$$y_2 = 2$$

2 2-9:29

$$\sqrt{x^2 + 16} = 5$$

|^2

$$\textcircled{1} \sqrt{\quad} \geq 0$$

$$x^2 + 16 \geq 0 \quad \checkmark \text{ ok}$$

$$\textcircled{2} L \geq 0$$

$$P > 0 \quad \checkmark \text{ ok}$$

$$x^2 + 16 = 25$$

$$x_1 = -3$$

$$x_2 = +3$$

$$K = \{-3; +3\}$$

2 2-9:37

$$2 \sqrt{x^2 - 4x + 4} = 4 - 2x \quad |^2$$

$$4(x^2 - 4x + 4) = (4 - 2x)^2$$

$$0 = 0$$

$$\textcircled{1} \quad x^2 - 4x + 4 \geq 0$$

$$(x - 2)^2 \geq 0 \quad \checkmark$$

$$\textcircled{2} \quad L \geq 0$$

$$P: \quad 4 - 2x \geq 0$$

$$4 \geq 2x$$

$$x \leq 2$$

$$K = (-\infty; 2]$$

23-9:23

$$2 \sqrt{x^2 - 4x + 4} = 4 - 2x$$

$$2 \sqrt{(x - 2)^2} = 4 - 2x$$

$$2|x - 2| = 2(2 - x)$$

$$|x - 2| = 2 - x$$

$$x - 2 < 0$$

$$x < 2: \quad -x + 2 = 2 - x$$

$$0 = 0$$

$$K_1 = (-\infty; 2) \quad \text{ok}$$

$$x - 2 \geq 0$$

$$x - 2 = 2 - x$$

$$x = 2$$

$$K_2 = \{2\}$$

$$\underline{\underline{K = (-\infty; 2]}}$$

23-9:30

$$2x + \sqrt{4x^2 - 12x + 9} = \sqrt{16x^2 - 48x + 36} + 3$$

$$2x + \sqrt{(2x-3)^2} = 2\sqrt{(2x-3)^2} + 3$$

$$2x-3 = \sqrt{(2x-3)^2}$$

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

$$2x-3 < 0$$

$$x < \frac{3}{2}$$

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

$$4x = 6$$

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

$$K_1 = \{\}$$

$$x \geq \frac{3}{2}$$

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

$$0 = 0$$

$$K_2 = \left(\frac{3}{2}; \infty\right)$$

$$K = K_2 = \underline{\underline{\left(\frac{3}{2}; \infty\right)}}$$

23-9:34

$$2\sqrt{2x+3} > 7$$

$$x \in \left(-\frac{3}{2}; \infty\right):$$

$$L: 2\sqrt{} \geq 0 +$$

$$P: 7 \quad +$$

$$2x+3 \geq 0$$

$$2x \geq -3$$

$$x \geq -\frac{3}{2}$$

$$4(2x+3) > 49$$

$$x > \frac{37}{8}$$

$$K = \underline{\underline{\left(\frac{37}{8}; \infty\right)}}$$

24-8:58

$\sqrt{x^2+x+2} > x-3$ U

① PODMÍNKA
 ② ZNAČENKA KVŮLI UMOCNĚNÍ
 ③ JEDNOTLIVÁ ŘEŠENÍ

② $L > 0$ +
 $P: x-3$ +

$x-3 > 0$
 $x > 3$
 $+ > +$
 $+ > +$

$x-3 \leq 0$
 $x \leq 3$
 $+ > -$ ✓
 $K_1 = (-\infty; 3)$

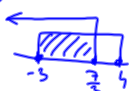
$x^2+x+2 > x^2-6x+9$
 $x > 1$

$x > 3$
 $K_2 = (3; \infty)$

$K_1 \cup K_2 = \mathbb{R}$

24-9:07

$\sqrt{x-x^2+12} < \sqrt{7-3x}$

① Podmínka
 a) $x-x^2+12 \geq 0$ b) $7-3x \geq 0$
 $D = +49$ $x \leq \frac{7}{3}$
 $x_{1,2} = \begin{matrix} -3 \\ 4 \end{matrix}$ 
 $x \in (-3; 4)$ $x \in (-3; \frac{7}{3})$

② ZNAČENKA: $L \geq 0$ $P \geq 0$
 tedy umocněním $\Rightarrow$ EKIVALENTNÍ

$x-x^2+12 < 7-3x$
 $0 < x^2-4x-5$
 $x_{1,2} = \begin{matrix} -1 \\ 5 \end{matrix}$ $(x+1)(x-5)$
 $K_1 = (-\infty; -1) \cup (5; \infty)$

$K = (-3; -1)$

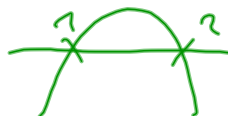
24-9:19

$$3\sqrt{3x - x^2 - 2} \geq x$$

① Podmínky

$$3x - x^2 - 2 \geq 0$$

$$x \in \langle 1; 2 \rangle$$



② ZNAMÉNKA (kvůli umocnění)

$\begin{matrix} L \dots + \\ P \dots - \end{matrix} \} \text{HOTOVÁ} \quad + \geq - \quad \text{PRO } x < 0$
NEVSTANE

$\begin{matrix} L \dots + \\ P \dots + \end{matrix} \} \text{MŮŽEME UMOCNIT}$

A NECHAT ZNAMÉNKA

$$9(3x - x^2 - 2) \geq x^2$$

$$-10x^2 + 27x - 18 \geq 0$$

D.Ú.