3.5.8 Řešení lineárních rovnic IV

Př. 1: Vyřeš rovnice.

    a) $\dfrac{(x-2)}{3}+1=4$ b) $2x+3=3(x-1)-x$

    c) $3(2x+1)+1=2(x-1)+x$ d) $3(2x-3)-2x=2(2x+1)-11$

a) $\dfrac{(x-2)}{3}+1=4$ $/-1$

$\dfrac{(x-2)}{3}=3$ $/\cdot 3$

$x-2=9$ $/+2$

$x=11$ $K=\{11\}$

b) $2x+3=3(x-1)-x$

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

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

$2x=2x-6$ $/-2x$

$0x=-6$ rovnice nemá řešení $K=\varnothing$

c) $3(2x+1)+1=2(x-1)+x$

$6x+3+1=2x-2+x$

$6x+4=3x-2$ $/-4$

$6x=3x-6$ $/-3x$

$3x=-6$ $/:3$

$x=-2$ $K=\{-2\}$

d) $3(2x-3)-2x=2(2x+1)-11$

$6x-9-2x=4x+2-11$

$4x-9=4x-9$ $/-4x+9$

$0x=0$ $K=R$

Př. 2: Vyřeš rovnice:

    a) $\dfrac{x}{2}=x+3$ b) $\dfrac{x}{3}-1=\dfrac{2}{3}-\dfrac{x}{2}$

    c) $\dfrac{x+1}{3}-2=\dfrac{2x+3}{4}+2x$ d) $\dfrac{x-1}{3}-\dfrac{x}{6}=3\cdot\dfrac{x+2}{2}+\dfrac{2}{3}$

a) $\dfrac{x}{2}=x+3$ $/\cdot 2$

$2\cdot\dfrac{x}{2}=2\cdot(x+3)$

$x=2x+6$ $/-x$

$0=x+6$ $/-6$

$x=-6$ $K=\{-6\}$

b) $\dfrac{x}{3}-1=\dfrac{2}{3}-\dfrac{x}{2}$ $/\cdot 6$

$6\cdot\left(\dfrac{x}{3}-1\right)=6\cdot\left(\dfrac{2}{3}-\dfrac{x}{2}\right)$

$2x-6=4-3x$ $/+3x$

$5x-6=4$ $/+6$

$5x=10$ $/:5$

$x=2$ $K=\{2\}$

c) $\dfrac{x+1}{3}-2=\dfrac{2x+3}{4}+2x$ $/\cdot 12$

d) $\dfrac{x-1}{3}-\dfrac{x}{6}=3\cdot\dfrac{x+2}{2}+\dfrac{2}{3}$ $/\cdot 6$

$$12 \cdot \left(\frac{x+1}{3} - 2 \right) = 12 \cdot \left(\frac{2x+3}{4} + 2x \right) \qquad\qquad 6 \cdot \left(\frac{x-1}{3} - \frac{x}{6} \right) = 6 \cdot \left(3 \cdot \frac{x+2}{2} + \frac{2}{3} \right)$$

$$4(x+1) - 24 = 3(2x+3) + 24x \qquad\qquad\qquad 2(x-1) - x = 9 \cdot (x+2) + 4$$

$$4x + 4 - 24 = 6x + 9 + 24x \qquad\qquad\qquad\quad 2x - 2 - x = 9x + 18 + 4$$

$$4x - 20 = 30x + 9 \quad / -4x \qquad\qquad\qquad\quad x - 2 = 9x + 22 \quad / -x - 22$$

$$-20 = 26x + 9 \quad / -9 \qquad\qquad\qquad\qquad\quad -24 = 8x \quad / : 8$$

$$26x = -29 \quad / : 26 \qquad\qquad\qquad\qquad\qquad x = -3 \qquad\qquad K = \{-3\}$$

$$x = -\frac{29}{26} \qquad K = \left\{ -\frac{29}{26} \right\}$$

Př. 3: Vyřeš rovnice.

a) $(x-2)^2 = (x+1)^2$ 　　　　　　　　　b) $(x-1)^2 + 3x = (x-2)(x+3)$

c) $(2x-1)(x+3) = (1+x)(2x+1)$ 　　　d) $(2x+3)(3x-1) - (2x+3)^2 = (2x+3)(x-3)$

a) $(x-2)^2 = (x+1)^2$ 　　　　　　　　　b) $(x-1)^2 + 3x = (x-2)(x+3)$

$$x^2 - 4x + 4 = x^2 + 2x + 1 \quad / -x^2 \qquad x^2 - 2x + 1 + 3x = x^2 + 3x - 2x - 6 \quad / -x^2$$

$$-4x + 4 = 2x + 1 \quad / +4x \qquad\qquad 1 + x = x - 6 \quad / -x$$

$$4 = 6x + 1 \quad / -1 \qquad\qquad\qquad\quad 1 = -6 \qquad\qquad\qquad K = \varnothing$$

$$3 = 6x \quad / : 6$$

$$x = \frac{1}{2} \qquad\qquad K = \left\{ \frac{1}{2} \right\}$$

c) $(2x-1)(x+3) = (1+x)(2x+1)$ 　　　d) $(2x+3)(3x-1) - (2x+3)^2 = (2x+3)(x-3)$

$$2x^2 + 6x - x - 3 = 2x + 1 + 2x^2 + x \quad / -2x^2 \quad 6x^2 - 2x + 9x - 3 - (4x^2 + 12x + 9) = 2x^2 - 6x + 3x - 9$$

$$5x - 3 = 3x + 1 \quad / -3x \qquad\qquad\qquad\quad 2x^2 - 5x - 12 = 2x^2 - 3x - 9 \quad / -2x^2$$

$$2x - 3 = 1 \quad / +3 \qquad\qquad\qquad\qquad\quad -5x - 12 = -3x - 9 \quad / +5x$$

$$2x = 4 \quad / : 2 \qquad\qquad\qquad\qquad\qquad\quad -12 = 2x - 9 \quad / +9$$

$$x = 2 \qquad\qquad K = \{2\} \qquad\qquad\qquad\quad -3 = 2x \quad / : 2$$

$$x = -\frac{3}{2} \qquad\qquad K = \left\{ -\frac{3}{2} \right\}$$

Shrnutí: