

## Lineární rovnice

1)  $2(x+1) - 6(3-4x) = 5 - 4x$

2)  $8 - [2 - (3 - 2x)] = 8 - 5x$

3)  $8 - 3[6 - 2(5 + x)] = 2(6 - 5x)$

4)  $\frac{2}{5}(10 - 3x) + 2 - 2x = 0$

5)  $\frac{3}{4}(3 + 4x) - \frac{2}{3} - 2x = 0$

6)  $\frac{1}{3}x - \frac{3}{4}x - \frac{5}{6}x = \frac{3}{2}$

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

8)  $\frac{3x-5}{4} - \frac{2x-7}{16} = -3$

9)  $\frac{x-2}{3} - \frac{x+4}{15} = \frac{2-3x}{5}$

10)  $9x - \frac{3}{2}(5x-1) = 5x - \frac{5}{8}$

11)  $-2x - \frac{3}{4}(2-x) = 3 - \frac{2}{3}(3x+1)$

12)  $2 - \frac{3x+5}{7} = \frac{5-2x}{4}$

13)  $(2-2x)(1+6x) - (5-12x)(2+x) = 0$

14)  $(2x-1)(3-2x) = 2 - (1-2x)^2$

15)  $3(2x-4) - 3(2-3x) = 2 - 3x$

16)  $7 - [2 - (3 - 2x)] = 8 - 5x$

17)  $\frac{2}{3}(4-x) + 2 - 3x = 0$

18)  $\frac{3}{5}(3-2x) + 2x = \frac{2}{3}$

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

20)  $\frac{x+3}{4} - \frac{x-5}{3} = 2$

21)  $2(1-x) = \frac{1}{3}(11-6x)$

22)  $x - \frac{2}{3} = 1 - \frac{1}{3}(5-3x)$

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

24)  $\frac{2x+3}{4} - \frac{3x-5}{3} = 2$

25)  $\frac{x-6}{4} - \frac{2x+3}{8} = \frac{2-5x}{2}$

## Řešení

1)

$$2(x+1) - 6(3-4x) = 5 - 4x$$

$$2x + 2 - 18 + 24x = 5 - 4x$$

$$2x + 24x + 4x = 5 - 2 + 18$$

$$30x = 21 \quad /:30$$

$$x = \frac{21}{30}$$

$$x = \frac{7}{10}$$

$$P = \left\{ \frac{7}{10} \right\}$$

2)

$$8 - [2 - (3 - 2x)] = 8 - 5x$$

$$8 - [2 - 3 + 2x] = 8 - 5x$$

$$8 - 2 + 3 - 2x = 8 - 5x$$

$$-2x + 5x = 8 - 8 + 2 - 3$$

$$3x = -1 \quad /:3$$

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

$$P = \left\{ -\frac{1}{3} \right\}$$

3)

$$8 - 3[6 - 2(5 + x)] = 2(6 - 5x)$$

$$8 - 3[6 - 10 - 2x] = 12 - 10x$$

$$8 - 18 + 30 + 6x = 12 - 10x$$

$$6x + 10x = 12 - 8 + 18 - 30$$

$$16x = -8 \quad /:16$$

$$x = -\frac{8}{16}$$

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

$$P = \left\{ -\frac{1}{2} \right\}$$

4)

$$\frac{2}{5}(10-3x)+2-2x=0$$

$$\frac{20}{5}-\frac{6x}{5}+2-2x=0 \quad / \cdot 5$$

$$20-6x+10-10x=0$$

$$-16x=-30 \quad / :(-16)$$

$$x=\frac{15}{8}$$

$$P=\left\{\frac{15}{8}\right\}$$

5)

$$\frac{3}{4}(3+4x)-\frac{2}{3}-2x=0$$

$$\frac{9}{4}+\frac{12x}{4}-\frac{2}{3}-2x=0 \quad / \cdot 12$$

$$27+36x-8-24x=0$$

$$12x=-19 \quad / :12$$

$$x=-\frac{19}{12}$$

$$P=\left\{-\frac{19}{12}\right\}$$

6)

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

$$\frac{x}{3}-\frac{3x}{4}-\frac{5x}{6}=\frac{3}{2} \quad / \cdot 12$$

$$4x-9x-10x=18$$

$$-15x=18 \quad / :(-15)$$

$$x=-\frac{6}{5}$$

$$P=\left\{-\frac{6}{5}\right\}$$

7)

$$\frac{2x-3}{5} - \frac{2x+1}{4} = 2 \quad / \cdot 20$$

$$4(2x-3) - 5(2x+1) = 40$$

$$8x - 12 - 10x - 5 = 40$$

$$-2x = 57 \quad / : (-2)$$

$$x = -\frac{57}{2}$$

$$P = \left\{ -\frac{57}{2} \right\}$$

8)

$$\frac{3x-5}{4} - \frac{2x-7}{16} = -3 \quad / \cdot 16$$

$$4(3x-5) - 1 \cdot (2x-7) = -48$$

$$12x - 20 - 2x + 7 = -48$$

$$10x = -35 \quad / : 10$$

$$x = -\frac{7}{2}$$

$$P = \left\{ -\frac{7}{2} \right\}$$

9)

$$\frac{x-2}{3} - \frac{x+4}{15} = \frac{2-3x}{5} \quad / \cdot 15$$

$$5(x-2) - 1 \cdot (x+4) = 3(2-3x)$$

$$5x - 10 - x - 4 = 6 - 9x$$

$$13x = 20 \quad / : 13$$

$$x = \frac{20}{13}$$

$$P = \left\{ \frac{20}{13} \right\}$$

10)

$$9x - \frac{3}{2}(5x - 1) = 5x - \frac{5}{8}$$

$$9x - \frac{15x}{2} + \frac{3}{2} = 5x - \frac{5}{8} \quad / \cdot 8$$

$$72x - 60x + 12 = 40x - 5$$

$$-28x = -17 \quad / : (-28)$$

$$x = \frac{17}{28}$$

$$P = \left\{ \frac{17}{28} \right\}$$

11)

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

$$-2x - \frac{6}{4} + \frac{3x}{4} = 3 - \frac{6x}{3} - \frac{2}{3} \quad / \cdot 12$$

$$-24x - 18 + 9x = 36 - 24x - 8$$

$$9x = 46 \quad / : 9$$

$$x = \frac{46}{9}$$

$$P = \left\{ \frac{46}{9} \right\}$$

12)

$$2 - \frac{3x + 5}{7} = \frac{5 - 2x}{4} \quad / \cdot 28$$

$$56 - 4(3x + 5) = 7(5 - 2x)$$

$$56 - 12x - 20 = 35 - 14x$$

$$2x = -1$$

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

$$P = \left\{ -\frac{1}{2} \right\}$$

**13)**

$$(2-2x)(1+6x)-(5-12x)(2+x)=0$$

$$2+12x-2x-12x^2-(10+5x-24x-12x^2)=0$$

$$2+12x-2x-12x^2-10-5x+24x+12x^2=0$$

$$29x=8 \quad /:29$$

$$x=\frac{8}{29}$$

$$P=\left\{\frac{8}{29}\right\}$$

**14)**

$$(2x-1)(3-2x)=2-(1-2x)^2$$

$$6x-4x^2-3+2x=2-(1-4x+4x^2)$$

$$6x-4x^2-3+2x=2-1+4x-4x^2$$

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

$$x=1$$

$$P=\{1\}$$

**15)**

$$3(2x-4)-3(2-3x)=2-3x$$

$$6x-12-6+9x=2-3x$$

$$6x+9x+3x=2+12+6$$

$$18x=20 \quad /:18$$

$$x=\frac{20}{18}$$

$$x=\frac{10}{9}$$

$$P=\left\{\frac{10}{9}\right\}$$

**16)**

$$7-[2-(3-2x)]=8-5x$$

$$7-(2-3+2x)=8-5x$$

$$7-2+3-2x=8-5x$$

$$-2x+5x=8-7+2-3$$

$$3x=0 \quad /:3$$

$$x=0$$

$$P=\{0\}$$

17)

$$\frac{2}{3}(4-x) + 2 - 3x = 0$$

$$\frac{8}{3} - \frac{2x}{3} + 2 - 3x = 0 \quad / \cdot 3$$

$$8 - 2x + 6 - 9x = 0$$

$$-11x = -14 \quad / : (-11)$$

$$x = \frac{14}{11}$$

$$P = \left\{ \frac{14}{11} \right\}$$

18)

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

$$\frac{9}{5} - \frac{6x}{5} + 2x = \frac{2}{3} \quad / \cdot 15$$

$$27 - 18x + 30x = 10$$

$$12x = -17 \quad / : 12$$

$$x = -\frac{17}{12}$$

$$P = \left\{ -\frac{17}{12} \right\}$$

19)

$$\frac{5}{4}x - \frac{1}{2}x + \frac{3}{4}x = \frac{2}{3} \quad / \cdot 12$$

$$15x - 6x + 9x = 8$$

$$18x = 8 \quad / : 18$$

$$x = \frac{8}{18}$$

$$x = \frac{4}{9}$$

$$P = \left\{ \frac{4}{9} \right\}$$

**20)**

$$\frac{x+3}{4} - \frac{x-5}{3} = 2 \quad / \cdot 12$$

$$3(x+3) - 4(x-5) = 24$$

$$3x+9 - 4x+20 = 24$$

$$-x = 24 - 9 - 20$$

$$-x = -5 \quad / \cdot (-1)$$

$$x = 5$$

$$P = \{5\}$$

**21)**

$$2(1-x) = \frac{1}{3}(11-6x)$$

$$2 - 2x = \frac{11}{3} - \frac{6x}{3} \quad / \cdot 3$$

$$6 - 6x = 11 - 6x$$

$$-6x + 6x = 11 - 6$$

$$0x = 5$$

rovnice nemá řešení

$$P = \emptyset$$

**22)**

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

$$x - \frac{2}{3} = 1 - \frac{5}{3} + \frac{3x}{3} \quad / \cdot 3$$

$$3x - 2 = 3 - 5 + 3x$$

$$3x - 3x = 3 - 5 + 2$$

$$0x = 0$$

rovnici vyhovuje

libovolné reálné číslo

$$P = R$$



23)

$$\frac{3x+4}{5} = \frac{1}{4} - \frac{x}{2} / \cdot 20$$

$$4(3x+4) = 5 - 10x$$

$$12x + 16 = 5 - 10x$$

$$12x + 10x = 5 - 16$$

$$22x = -11 / : 22$$

$$x = -\frac{11}{22}$$

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

$$P = \left\{ -\frac{1}{2} \right\}$$

24)

$$\frac{2x+3}{4} - \frac{3x-5}{3} = 2 / \cdot 12$$

$$3(2x+3) - 4(3x-5) = 24$$

$$6x + 9 - 12x + 20 = 24$$

$$-6x = 24 - 9 - 20$$

$$-6x = -5 / : (-6)$$

$$x = \frac{5}{6}$$

$$P = \left\{ \frac{5}{6} \right\}$$

25)

$$\frac{x-6}{4} - \frac{2x+3}{8} = \frac{2-5x}{2} / \cdot 8$$

$$2(x-6) - 1 \cdot (2x+3) = 4(2-5x)$$

$$2x - 12 - 2x - 3 = 8 - 20x$$

$$20x = 8 + 12 + 3$$

$$20x = 23 / \cdot 20$$

$$x = \frac{23}{20}$$

$$P = \left\{ \frac{23}{20} \right\}$$