

Výpočet rovnice

jméno:

třída:

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00 Hodnota výrazu – zkouška rovnice 1

1) Vypočítej hodnotu výrazu $3x - 2$

a) pro $x = 1$

$$3x - 2 = 3 \cdot 1 - 2 = \underline{\underline{1}}$$

b) pro $x = 3$

$$3 \cdot 3 - 2 = 9 - 2 = \underline{\underline{7}}$$

c) pro $x = -1$

$$3 \cdot (-1) - 2 = -3 - 2 = \underline{\underline{-5}}$$

3) Vypočítej hodnotu výrazu $2 \cdot (5x - 2)$

a) pro $x = 2$

$$2 \cdot (5 \cdot 2 - 2) = 2 \cdot (10 - 2) = \underline{\underline{16}}$$

b) pro $x = -1$

$$\begin{aligned} 2 \cdot (5 \cdot (-1) - 2) &= 2 \cdot (-5 - 2) = \\ 2 \cdot (-7) &= \underline{\underline{-14}} \end{aligned}$$

c) pro $x = \frac{2}{5}$

$$2 \cdot \left(5 \cdot \frac{2}{5} - 2\right) = 2 \cdot (2 - 2) = 2 \cdot 0 = \underline{\underline{0}}$$

5) Vypočítej hodnotu výrazu $4x - 3$

a) pro $x = \frac{5}{8}$

$$4 \cdot \frac{5}{8} - 3 = \frac{5}{2} - \frac{6}{2} = -\frac{1}{2}$$

b) pro $x = \frac{5}{6}$

$$4 \cdot \frac{5}{6} - 3 = \frac{10}{3} - \frac{3}{1} = \frac{10}{3} - \frac{9}{3} = \frac{1}{3}$$

c) pro $x = -\frac{3}{2}$

$$4x - 3$$

$$4 \cdot \left(-\frac{3}{2}\right) - 3 = -6 - 3 = \underline{\underline{-9}}$$

2) Vypočítej hodnotu výrazu $3x - 2x + 15 - 6x$

a) pro $x = 1$

$$3 \cdot 1 - 2 \cdot 1 + 15 - 6 \cdot 1 = 3 - 2 + 15 - 6 = 10$$

b) pro $x = -2$

$$\begin{aligned} 3 \cdot (-2) - 2 \cdot (-2) + 15 - 6 \cdot (-2) &= \\ -6 + 4 + 15 + 12 &= \underline{\underline{25}} \end{aligned}$$

4) Vypočítej hodnotu výrazu $2 \cdot (x - 2) - (5 - 2x)$

a) pro $x = 2$

$$\begin{aligned} 2 \cdot (2 - 2) - (5 - 2 \cdot 2) &= 2 \cdot 0 - (5 - 4) = 0 - 1 = \\ &= \underline{\underline{-1}} \end{aligned}$$

b) pro $x = \frac{5}{2}$

$$\begin{aligned} 2 \cdot \left(\frac{5}{2} - 2\right) - \left(5 - 2 \cdot \frac{5}{2}\right) &= 2 \cdot \left(\frac{5}{2} - \frac{4}{2}\right) - (5 - 5) \\ &= 2 \cdot \frac{1}{2} - 0 = \underline{\underline{1}} \end{aligned}$$

6) Vypočítej hodnotu výrazu $2 \cdot (3x - 2) - (5 - x)$

a) pro $x = -3$

$$\begin{aligned} 2 \cdot [3 \cdot (-3) - 2] - [5 - (-3)] &= 2 \cdot [-9 - 2] - [5 + 3] \\ &= 2 \cdot [-11] - [8] = -22 - 8 = \underline{\underline{-30}} \end{aligned}$$

b) pro $x = \frac{1}{3}$

$$\begin{aligned} 2 \cdot \left(3 \cdot \frac{1}{3} - 2\right) - \left(5 - \frac{1}{3}\right) &= 2 \cdot (1 - 2) - \left(\frac{5}{1} - \frac{1}{3}\right) \\ &= 2 \cdot (-1) - \left(\frac{15}{3} - \frac{1}{3}\right) = -2 - \frac{14}{3} = \frac{-6}{3} - \frac{14}{3} = \underline{\underline{-\frac{20}{3}}} \end{aligned}$$

00 Hodnota výrazu – zkouška rovnice 2

1) Vypočítej hodnotu výrazu $\frac{x-3}{4} - \frac{x+1}{2}$

a) pro $x = 3$

$$\frac{3-3}{4} - \frac{3+1}{2} = \frac{0}{4} - \frac{4}{2} = -\underline{\underline{2}}$$

b) pro $x = -1$

$$\frac{-1-3}{4} - \frac{-1+1}{2} = -\frac{4}{4} - \frac{0}{2} = -\underline{\underline{1}}$$

c) pro $x = -5$

$$\frac{-5-3}{4} - \frac{-5+1}{2} = \frac{-8}{4} - \frac{-4}{2} = -2 + 2 = \underline{\underline{0}}$$

2) Vypočítej hodnotu výrazu $\frac{5-x}{3} - \frac{2x-1}{2}$

a) pro $x = 2$

$$\frac{5-2}{3} - \frac{2 \cdot 2 - 1}{2} = \frac{3}{3} - \frac{4-1}{2} = 1 - \frac{3}{2} = \frac{2}{2} - \frac{3}{2} = -\underline{\underline{\frac{1}{2}}}$$

b) pro $x = -1$

$$\begin{aligned} \frac{5-(-1)}{3} - \frac{2 \cdot (-1) - 1}{2} &= \frac{6}{3} - \frac{-2-1}{2} \\ &= 2 - \frac{-3}{2} = 2 + \frac{3}{2} = \frac{4}{2} + \frac{3}{2} = \underline{\underline{\frac{7}{2}}} \end{aligned}$$

3) Vypočítej hodnotu výrazu $\frac{12-3 \cdot (6x-1)}{2} + \frac{5x}{4}$

a) pro $x = 0$

$$\frac{12-3 \cdot (6 \cdot 0 - 1)}{2} + \frac{5 \cdot 0}{4} = \frac{12-3 \cdot (-1)}{2} + \frac{0}{4} = \frac{12+3}{2} = \underline{\underline{\frac{15}{2}}}$$

b) pro $x = 1$

$$\begin{aligned} \frac{12-3 \cdot (6-1)}{2} + \frac{5}{4} &= \frac{12-3 \cdot 5}{2} + \frac{5}{4} = \frac{12-15}{2} + \frac{5}{4} = -\frac{3}{2} + \frac{5}{4} \\ &= \frac{-6+5}{4} = -\underline{\underline{\frac{1}{4}}} \end{aligned}$$

c) pro $x = \frac{5}{6}$

$$\frac{12-3 \cdot (6 \cdot \frac{5}{6} - 1)}{2} + \frac{5 \cdot \frac{5}{6}}{4} = \frac{12-3 \cdot 4}{2} + \frac{25}{6} \cdot \frac{1}{4} = \frac{0}{2} + \frac{25}{6} \cdot \frac{1}{4} = \underline{\underline{\frac{25}{24}}}$$

4) Vypočítej hodnotu výrazu $(x+2) \cdot (x-3) - (x+2)^2$

a) pro $x = 3$

$$(3+2) \cdot (3-3) - (3+2)^2 = 5 \cdot 0 - 5^2 = -\underline{\underline{25}}$$

b) pro $x = -1$

$$(-1+2) \cdot (-1-3) - (-1+2)^2 = 1 \cdot (-4) - (1)^2 = -4 - 1 = -\underline{\underline{5}}$$

c) pro $x = \frac{3}{2}$

$$\begin{aligned} \left(\frac{3}{2}+2\right) \cdot \left(\frac{3}{2}-3\right) - \left(\frac{3}{2}+2\right)^2 &= \left(\frac{3}{2}+\frac{4}{2}\right) \cdot \left(\frac{3}{2}-\frac{6}{2}\right) - \left(\frac{3}{2}+\frac{4}{2}\right)^2 \\ &= \frac{7}{2} \cdot \left(-\frac{3}{2}\right) - \left(\frac{7}{2}\right)^2 = -\frac{21}{2} - \frac{49}{4} = \frac{-42-49}{4} = -\underline{\underline{\frac{91}{4}}} \end{aligned}$$

00 Hodnota výrazu – zkouška rovnice 3

1) Ověř dosazením do rovnice $2 \cdot (x - 2) = 3 + 5 - 2x$, zda jsou hodnoty $-1, 3$ kořeny rovnice.

vzor:

$$L(-1): 2 \cdot (x - 2) = 2 \cdot (-1 - 2) = 2 \cdot (-3) = -6$$

$$L(3): 2 \cdot (3 - 2) = 2 \cdot 1 = 2$$

$$P(-1): 3 + 5 - 2x = 3 + 5 - 2 \cdot (-1) = 3 + 5 + 2 = 10$$

$$P(3): 3 + 5 - 2 \cdot 3 = 8 - 6 = 2$$

$$-6 \neq 10$$

$$L = P$$

$$L > \underline{x = 3}$$

$$L \neq P \rightarrow x \neq -1$$

O: Číslo -1 není řešení rovnice

2) Ověř dosazením do rovnice $3 \cdot (x - 3) + 4 = 3x + 5 \cdot (1 - x)$, zda jsou hodnoty $1, 2$ kořeny rovnice.

$$L(1): 3 \cdot (1 - 3) + 4 = 3 \cdot (-2) + 4 = -6 + 4 = -2$$

$$L(2): 3 \cdot (2 - 3) + 4 = 3 \cdot (-1) + 4 = -3 + 4 = 1$$

$$P(1): 3 \cdot 1 + 5 \cdot (1 - 1) = 6 + 5 \cdot 0 = 6$$

$$P(2): 3 \cdot 2 + 5 \cdot (1 - 2) = 6 + 5 \cdot (-1) = 6 - 5 = 1$$

$$L \neq P$$

$$L = P$$

$$L > \underline{x = 2}$$

3) Ověř dosazením do rovnice $5x + 1 = 3x + \frac{1}{2}$, zda jsou hodnoty $-\frac{1}{4}, -3$ kořeny rovnice.

$$L(-\frac{1}{4}): 5 \cdot (-\frac{1}{4}) + 1 = -\frac{5}{4} + \frac{4}{4} = -\frac{1}{4}$$

$$L(-3): 5 \cdot (-3) + 1 = -15 + 1 = -14$$

$$P(-\frac{1}{4}): 3 \cdot (-\frac{1}{4}) + \frac{1}{2} = -\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$$

$$P(-3): 3 \cdot (-3) + \frac{1}{2} = -9 + \frac{1}{2} = -\frac{18}{2} + \frac{1}{2} = -\frac{17}{2}$$

$$L \neq P$$

$$L = P$$

$$L > \underline{x = -\frac{1}{4}}$$

4) Ověř dosazením do rovnice $\frac{2-x}{2} + 2x = 2,5x - 3$, zda jsou hodnoty $4, -2$ kořeny rovnice.

$$L(4): \frac{2-4}{2} + 2 \cdot 4 = -\frac{2}{2} + 8 = -1 + 8 = 7$$

$$L(-2): \frac{2-(-2)}{2} + 2 \cdot (-2) = \frac{2+2}{2} - 4 = \frac{4}{2} - 4 = 2 - 4 = -2$$

$$P(4): 2,5 \cdot 4 - 3 = 10 - 3 = 7$$

$$P(-2): 2,5 \cdot (-2) - 3 = -5 - 3 = -8$$

$$L \neq P$$

$$L = P$$

$$L > \underline{x = 4}$$

5) Ověř dosazením do rovnice $7 \cdot \frac{y-3}{6} - \frac{6y+6}{9} = \frac{1}{3}$, zda jsou hodnoty $3, 9$ kořeny rovnice.

$$L(3): 7 \cdot \frac{3-3}{6} - \frac{6 \cdot 3 + 6}{9} = 7 \cdot \frac{0}{6} - \frac{18+6}{9} = -\frac{24}{9} = -\frac{8}{3}$$

$$P(3): \frac{1}{3}$$

$$L \neq P$$

[složit ve vidku]

$$L(9): 7 \cdot \frac{9-3}{6} - \frac{6 \cdot 9 + 6}{9} = 7 \cdot \frac{6}{6} - \frac{60}{9} = 7 - \frac{20}{3} = \frac{7}{1} - \frac{20}{3} = \frac{21}{3} - \frac{20}{3} = \frac{1}{3}$$

$$P(9): \frac{1}{3}$$

$$L = P$$

$$L > \underline{x = 9}$$

6) Ověř dosazením do rovnice $3 \cdot \frac{y+1}{2} - \frac{y}{3} = \frac{3}{2} \cdot \frac{2y-3}{3} + \frac{3}{2}$, zda jsou hodnoty $9, -9$ kořeny rovnice.

$$L(-9): 3 \cdot \frac{-9+1}{2} - \frac{-9}{3} = 3 \cdot \frac{-8}{2} + 3 = 3 \cdot (-4) + 3 = -12 + 3 = -9$$

$$P(-9): \frac{3}{2} \cdot \frac{2 \cdot (-9) - 3}{3} + \frac{3}{2} = \frac{3}{2} \cdot \frac{-21}{3} + \frac{3}{2} = -\frac{21}{2} + \frac{3}{2} = -\frac{18}{2} = -9$$

$$L = P$$

$$L > \underline{x = -9}$$

$$L(9): 3 \cdot \frac{9+1}{2} - \frac{9}{3} = 3 \cdot \frac{10}{2} - 3 = 15 - 3 = 12$$

$$P(9): \frac{3}{2} \cdot \frac{18-3}{3} + \frac{3}{2} = \frac{3}{2} \cdot \frac{15}{3} + \frac{3}{2} = \frac{15}{2} + \frac{3}{2} = \frac{18}{2} = 9$$

$$L = P$$

01 Jednoduché rovnice 1

Řeš rovnici (zatím bez zkoušky)

$$x = 6 - 1$$

$$\underline{x = 5}$$

$$\begin{array}{l} x+1=6 \quad /-1 \\ x+1-1=6-1 \\ \underline{x=5} \end{array}$$

$$y = 12 - 2$$

$$\underline{y = 10}$$

$$\begin{array}{l} y+2=12 \\ y+2-2=12-2 \\ \underline{y=10} \end{array}$$

$$z = 3 + 1$$

$$\underline{z = 4}$$

$$\begin{array}{l} z-1=3 \quad /+1 \\ z-1+1=3+1 \\ \underline{z=4} \end{array}$$

$$2c - c = 3 - 2$$

$$\underline{c = 1}$$

$$\begin{array}{l} 2c = 3 - 2 + c \\ 2c = 1 + c \quad /-c \\ 2c - c = 1 + c - c \\ \underline{c = 1} \end{array}$$

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

$$\begin{array}{l} x+2-2=3-2 \\ \underline{x=1} \end{array}$$

$$y - 4 = -3 \quad /+4$$

$$\begin{array}{l} y-4+4=-3+4 \\ \underline{y=1} \end{array}$$

$$z + 2 = 1 \quad /-2$$

$$\begin{array}{l} z+2-2=1-2 \\ \underline{z=-1} \end{array}$$

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

$$\begin{array}{l} 2x-x=x-x \\ \underline{x=0} \end{array}$$

$$3y = 2y + 1 \quad /-2y$$

$$\begin{array}{l} 3y-2y=2y-2y+1 \\ \underline{y=1} \end{array}$$

$$4z - 1 = 3z + 1 \quad /-3z$$

$$\begin{array}{l} 4z-3z-1=3z-3z+1 \\ z-1=1 \quad /+1 \\ z-1+1=1+1 \\ \underline{z=2} \end{array}$$

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

$$\begin{array}{l} 2z+2-2=4-2 \\ 2z=2 \quad /:2 \\ \underline{z=1} \end{array}$$

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

$$\underline{x = 1}$$

$$3y = 5 - 2$$

$$\begin{array}{l} 3y=3 \quad /:3 \\ \underline{y=1} \end{array}$$

$$2x = 1 \quad /:2$$

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

$$3y = 4 \quad /:3$$

$$\underline{y = \frac{4}{3}}$$

$$5z = -7 \quad /:5$$

$$\underline{z = -\frac{7}{5}}$$

$$\begin{array}{l} -x = -1 \quad / \cdot (-1) \\ \underline{x = 1} \end{array}$$

$$\begin{array}{l} -2y = 2 \quad /:(-2) \\ \underline{y = -1} \end{array}$$

$$\begin{array}{l} z - 4z = 6 \\ -3z = 6 \quad /:3 \\ -z = 2 \quad / \cdot (-1) \\ \underline{z = -2} \end{array}$$

$$\begin{array}{l} z - 2z + 5 = z \\ -z + 5 = z \quad /+z \\ -z+z+5=z+z \\ 5=2z \quad /:2 \\ \underline{\frac{5}{2} = z} \end{array}$$

$$\begin{array}{l} x = x \quad /-x \\ x-x=x-x \\ 0=0 \\ \text{NEKONEČNĚ MNOHO} \\ \text{ŘEŠENÍ} \end{array}$$

$$\begin{array}{l} y+1=y+1 \quad /-y \\ y-y+1=y-y+1 \\ 1=1 \quad /-1 \\ 0=0 \\ \text{NEKONEČNĚ MNOHO} \\ \text{ŘEŠENÍ} \end{array}$$

$$\begin{array}{l} x = x + 1 \quad /-x \\ x-x=x-x+1 \\ 0=1 \\ \text{ROVNICE NEMÁ} \\ \text{ŘEŠENÍ} \end{array}$$

$$\begin{array}{l} 2y+1=y+1 \quad /-y-1 \\ 2y-y+1-1=y-y+1-1 \\ \underline{y=0} \end{array}$$

$$\begin{array}{l} 2y + 1 = 2y \quad /-2y \\ 2y-2y+1=2y-2y \\ 1=0 \\ \text{NEMÁ ŘEŠENÍ} \end{array}$$

$$\begin{array}{l} 3z - 6 + z = 5z - z - 6 \\ 4z - 6 = 4z - 6 \quad /-4z+6 \\ 4z-4z-6+6=4z-4z-6+6 \\ 0=0 \\ \text{NEKONEČNĚ MNOHO} \\ \text{ŘEŠENÍ} \end{array}$$

$$\begin{array}{l} 100z - 50 = 50z + 50 \quad /-50z \\ 100z - 50z - 50 = 50z - 50z + 50 \\ 50z - 50 = 50 \quad /+50 \\ 50z = 100 \quad /:50 \\ \underline{z = 2} \end{array}$$

$$\begin{array}{l} 8y = 2y - 4 \quad /-2y \\ 8y-2y = -4 \quad /:6 \\ 6y = -4 \quad /:3 \\ \underline{y = -\frac{2}{3}} \end{array}$$

01 Jednoduché rovnice 2

Řeš rovnici a proved' zkoušku

1)

$$3x - 1 = 5x + 3 \quad /-5x + 1$$

$$3x - 5x = 3 + 1 \quad \text{zk:}$$

$$-2x = 4 \quad /:2 \quad L_{(-2)}: 3 \cdot (-2) - 1 = -6 - 1 = -7$$

$$-x = 2 \quad /:(-1) \quad P_{(-2)}: 5 \cdot (-2) + 3 = -10 + 3 = -7$$

$$\underline{x = -2} \quad L = P$$

2)

$$6y - 2y = 5 + 2y$$

$$4y = 5 + 2y \quad /-2y \quad \text{zk: } 3 \cdot \frac{5}{2} - 2 \cdot \frac{5}{2} = 15 - 5 = 10$$

$$4y - 2y = 5 \quad L_{(\frac{5}{2})}: 6 \cdot \frac{5}{2} - 2 \cdot \frac{5}{2} = 15 - 5 = 10$$

$$2y = 5 \quad /:2 \quad P_{(\frac{5}{2})}: 5 + 2 \cdot \frac{5}{2} = 5 + 5 = 10$$

$$\underline{y = \frac{5}{2}} \quad L = P$$

3)

$$6z + 15 + 9z = 15z - 20$$

$$15 + 15z = 15z - 20 \quad /-15z - 15$$

$$15z - 15z = -20 - 15$$

$$0 = -35$$

ROVNICE NEMÁ ŘEŠENÍ

4)

$$8y + 2y = 5y - 4 + 5y$$

$$10y = 10y - 4 \quad /-10y$$

$$10y - 10y = -4$$

$$0 = -4$$

NEMÁ ŘEŠENÍ

5)

$$4x - 6 = x + 6 \quad /-x + 6$$

$$4x - x = 6 + 6$$

$$3x = 12 \quad /:3 \quad \text{zk:}$$

$$x = 4 \quad L_{(4)}: 4 \cdot 4 - 6 = 10$$

$$P_{(4)}: 4 + 6 = 10$$

$$L = P$$

6)

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

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

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

$$\underline{x = 2} \quad \text{zk: } L_{(2)}: 4 \cdot 2 - 2 = 8 - 2 = 6$$

$$P_{(2)}: 2 + 4 = 6 \quad L = P$$

7)

$$5x + 1 = x + 9 \quad /-x - 1$$

$$5x - x = 9 - 1$$

$$4x = 8 \quad /:4$$

$$\underline{x = 2} \quad \text{zk:}$$

$$L_{(2)}: 5 \cdot 2 + 1 = 11$$

$$P_{(2)}: 2 + 9 = 11 \quad L = P$$

8)

$$6x + 3 = 3x + 9 \quad /-3x - 3$$

$$6x - 3x = 9 - 3$$

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

$$\underline{x = 2} \quad \text{zk: } L_{(2)}: 6 \cdot 2 + 3 = 12 + 3 = 15$$

$$P_{(2)}: 3 \cdot 2 + 9 = 6 + 9 = 15$$

$$L = P$$

9)

$$7x - 3x = 2x + 4$$

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

$$4x - 2x = 4$$

$$2x = 4 \quad /:2$$

$$\underline{x = 2} \quad \text{zk:}$$

$$L_{(2)}: 7 \cdot 2 - 3 \cdot 2 = 14 - 6 = 8$$

$$P_{(2)}: 2 \cdot 2 + 4 = 8 \quad L = P$$

10)

$$9x - 5x = 3x + 5$$

$$4x = 3x + 5 \quad /-3x$$

$$4x - 3x = 5$$

$$x = 5 \quad \text{zk:}$$

$$L_{(5)}: 9 \cdot 5 - 5 \cdot 5 = 45 - 25 = 20$$

$$P_{(5)}: 3 \cdot 5 + 5 = 15 + 5 = 20$$

$$L = P$$

11)

$$3x - 5 = 2x + 15 \quad /-2x + 5$$

$$3x - 2x = 15 + 5$$

$$\underline{x = 20}$$

$$\text{zk: } L_{(20)}: 3 \cdot 20 - 5 = 60 - 5 = 55$$

$$P_{(20)}: 2 \cdot 20 + 15 = 40 + 15 = 55$$

$$L = P$$

12)

$$5x - 4 = 2x + 5 \quad /+4 - 2x$$

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

$$3x = 9 \quad /:3$$

$$\underline{x = 3} \quad \text{zk:}$$

$$L_{(3)}: 5 \cdot 3 - 4 = 15 - 4 = 11$$

$$P_{(3)}: 2 \cdot 3 + 5 = 11 \quad L = P$$

01 Jednoduché rovnice 3

Řeš rovnici a proved' zkoušku

1)

$$3x - 13 = x + 7 \quad /+13 - x$$

$$3x - x = 7 + 13$$

$$2x = 20 \quad /:2$$

$$x = 10$$

zk:

$$L_{(10)}: 3 \cdot 10 - 13 = 30 - 13 = 17$$

$$P_{(10)}: 10 + 7 = 17 \quad L = P$$

2)

$$4x - 5 = 2x + 5 \quad /-2x + 5$$

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

$$2x = 10 \quad /:2$$

$$x = 5$$

zk:

$$L_{(5)}: 4 \cdot 5 - 5 = 20 - 5 = 15$$

$$P_{(5)}: 2 \cdot 5 + 5 = 10 + 5 = 15$$

$$L = P$$

3)

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

$$5x - 3x = 12 - 2$$

$$2x = 10$$

$$x = 5$$

zk:

$$L_{(5)}: 5 \cdot 2 = 27$$

$$P_{(5)}: 15 + 12 = 27 \quad L = P$$

4)

$$7x + 4 = 4x - 5 \quad /-4x - 4$$

$$7x - 4x = -5 - 4$$

$$3x = -9 \quad /:3$$

$$x = -3$$

zk:

$$L_{(-3)}: 7 \cdot (-3) + 4 = -21 + 4 = -17$$

$$P_{(-3)}: 4 \cdot (-3) - 5 = -12 - 5 = -17$$

$$L = P$$

5)

$$7x - x = 3x + 3$$

$$6x = 3x + 3 \quad /-3x$$

$$6x - 3x = 3$$

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

$$x = 1$$

zk:

$$L_{(1)}: 7 - 1 = 6$$

$$P_{(1)}: 3 + 3 = 6 \quad L = P$$

6)

$$12x + 3 = 10x - 3 \quad /-10x - 3$$

$$12x - 10x = -3 - 3$$

$$2x = -6 \quad /:2$$

$$x = -3$$

zk:

$$L_{(-3)}: 12 \cdot (-3) + 3 = -36 + 3 = -33$$

$$P_{(-3)}: 10 \cdot (-3) - 3 = -30 - 3 = -33$$

$$L = P$$

7)

$$3x + 2x + 3 = 13$$

$$5x + 3 = 13 \quad /-3$$

$$5x = 13 - 3$$

$$5x = 10 \quad /:5$$

$$x = 2$$

zk:

$$L_{(2)}: 6 + 4 + 3 = 13$$

$$P_{(2)}: 13$$

$$L = P$$

8)

$$4x - 6 = 3x + 14 \quad /-3x + 6$$

$$4x - 3x = 14 + 6$$

$$x = 20$$

zk:

$$L_{(20)}: 80 - 6 = 74$$

$$P_{(20)}: 60 + 14 = 74$$

$$L = P$$

9)

$$6x - 9 = 3x - 3 \quad /-3x + 9$$

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

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

$$x = 2$$

$$zk: L_{(2)}: 12 - 9 = 3$$

$$P_{(2)}: 6 - 3 = 3 \quad L = P$$

10)

$$12x - 7 = 10x + 7 \quad /+7 -10x$$

$$12x - 10x = 7 + 7$$

$$2x = 14 \quad /:2$$

$$x = 7$$

zk:

$$L_{(7)}: 12 \cdot 7 - 7 = 84 - 7 = 77$$

$$P_{(7)}: 10 \cdot 7 + 7 = 70 + 7 = 77$$

$$L = P$$

11)

$$7x - x = 3x + 3$$

$$6x = 3x + 3 \quad /-3x$$

$$6x - 3x = 3$$

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

$$x = 1$$

zk:

$$L_{(1)}: 7 - 1 = 6$$

$$P_{(1)}: 3 + 3 = 6 \quad L = P$$

12)

$$10x + 10 = 5x + 20 \quad /-10 -5x$$

$$10x - 5x = 20 - 10$$

$$5x = 10 \quad /:5$$

$$x = 2$$

zk:

$$L_{(2)}: 20 + 10 = 30$$

$$P_{(2)}: 10 + 20 = 30$$

$$L = P$$

01 Jednoduché rovnice 4
Řeš rovnici a proved' zkoušku

1)

$$-2x + 4 = 5 - x \quad / +x - 4$$

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

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

$$\underline{x = -1}$$

zk:

$$L_{(-1)}: -2 \cdot (-1) + 4 = 2 + 4 = 6$$

$$P_{(-1)}: 5 - (-1) = 5 + 1 = 6$$

$$L = P$$

2)

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

$$6x - 12 + 5 = x + 3$$

$$6x - 7 = x + 3 \quad / +7 - x$$

$$6x - x = 3 + 7$$

$$5x = 10 \quad / :5$$

$$\underline{x = 2}$$

zk:

$$L_{(2)}: 6 \cdot (2 - 2) + 5 = 5$$

$$P_{(2)}: 2 + 3 = 5 \quad L = P$$

3)

$$3 \cdot (z - 1) = 2 \cdot (2 + z) + 1$$

$$3z - 3 = 4 + 2z + 1$$

$$3z - 3 = 2z + 5 \quad / -2z + 3$$

$$3z - 1z = 5 + 3$$

$$\underline{z = 8}$$

$$zk: L_{(8)}: 3 \cdot (8 - 1) = 3 \cdot 7 = 21$$

$$P_{(8)}: 2 \cdot (2 + 8) + 1 = 20 + 1 = 21$$

$$L = P$$

4)

$$3 \cdot (y + 5) = 2 \cdot (y + 6)$$

$$3y + 15 = 2y + 12 \quad / -2y - 15$$

$$3y - 2y = 12 - 15$$

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

zk:

$$L_{(-3)}: 3 \cdot (-3 + 5) = 3 \cdot 2 = 6$$

$$P_{(-3)}: 2 \cdot (-3 + 6) = 2 \cdot 3 = 6$$

$$L = P$$

5)

$$4y + 12 = 5(y - 3) + 22$$

$$4y + 12 = 5y - 15 + 22$$

$$4y + 12 = 5y + 7 \quad / -4y - 7$$

$$12 - 7 = 5y - 4y$$

$$\underline{5 = y}$$

$$zk: L_{(5)}: 20 + 12 = 32$$

$$P_{(5)}: 5 \cdot (5 - 3) + 22 = 5 \cdot 2 + 22 = 10 + 22 = 32$$

$$L = P$$

6)

$$2 \cdot (2 - 2x) = 12 - 6x$$

$$4 - 4x = 12 - 6x \quad / +6x - 4$$

$$-4x + 6x = 12 - 4$$

$$2x = 8 \quad / :2$$

$$\underline{x = 4}$$

zk:

$$L_{(4)}: 2 \cdot (2 - 2 \cdot 4) = 2 \cdot (-6) = -12$$

$$P_{(4)}: 12 - 6 \cdot 4 = 12 - 24 = -12$$

$$L = P$$

7)

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

$$2x + 6 = 5x - 10 - 2$$

$$2x + 6 = 5x - 12 \quad / -5x - 6$$

$$2x - 5x = -12 - 6$$

$$-3x = -18 \quad / :(-3)$$

$$\underline{x = 6}$$

$$zk: L_{(6)}: 2 \cdot (6 + 3) = 2 \cdot 9 = 18$$

$$P_{(6)}: 5 \cdot (6 - 2) - 2 = 20 - 2 = 18$$

$$L = P$$

8)

$$4z + 3 = 13 - 3 \cdot (z + 1)$$

$$4z + 3 = 13 - 3z - 3$$

$$4z + 3 = 10 - 3z \quad / +3z - 3$$

$$4z + 3z = 10 - 3$$

$$7z = 7 \quad / :7$$

$$\underline{z = 1}$$

zk:

$$L_{(1)}: 4 + 3 = 7$$

$$P_{(1)}: 13 - 3 \cdot (1 + 1) = 13 - 6 = 7$$

$$L = P$$

01 Jednoduché rovnice 5
Řeš rovnici a proved' zkoušku

1) $12 \cdot (x+2) = 5 \cdot (2-x) - 3$

$$12x + 24 = 10 - 5x - 3$$

$$12x + 24 = 7 - 5x \quad /+5x - 24$$

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

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

$$\underline{x = -1}$$

zk: $L_{(-1)}: 12 \cdot (-1+2) = 12 \cdot 1 = 12$
 $P_{(-1)}: 5 \cdot [2 - (-1)] - 3 = 5 \cdot [2+1] - 3 = 5 \cdot 3 - 3 = 12$
 $L = P$

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

$$3x - 21 = 8 - 4x - 1$$

$$3x - 21 = 7 - 4x \quad /+21 + 4x$$

$$3x + 4x = 7 + 21$$

$$7x = 28 \quad /:7$$

$$\underline{x = 4}$$

zk: $L_{(4)}: 3 \cdot (4-7) = 3 \cdot (-3) = -9$
 $P_{(4)}: 4 \cdot (2-4) - 1 = 4 \cdot (-2) - 1 = -8 - 1 = -9$
 $L = P$

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

$$4x + 2 - 7 = 4x - 4 - x$$

$$4x - 5 = 3x - 4 \quad /-3x + 5$$

$$4x - 3x = -4 + 5$$

$$\underline{x = 1}$$

zk: $L_{(1)}: 2 \cdot (2+1) - 7 = 6 - 7 = -1$
 $P_{(1)}: 4 \cdot (1-1) - 1 = -1$
 $L = P$

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

$$3x + 2 - 1 + x = 5x + 10 - x - 3$$

$$4x + 1 = 4x + 7 \quad /-4x - 1$$

$$4x - 4x = 7 - 1$$

$$0 = 6$$

NEMÁ ŘEŠENÍ

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

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

$$5x + 1 = 3x + 3 \quad /-1 - 3x$$

$$5x - 3x = 3 - 1$$

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

$$\underline{x = 1}$$

zk: $L_{(1)}: 3 \cdot (1-1) + 2 \cdot (1+2) = 6$
 $P_{(1)}: 3 \cdot (1+1) = 6$
 $L = P$

6) $3 \cdot (2-y) - 4 = 3 \cdot (y+2) + 2$

$$6 - 3y - 4 = 3y + 6 + 2$$

$$-3y + 2 = 3y + 8 \quad /-2 - 3y$$

$$-3y - 3y = 8 - 2$$

$$-6y = 6 \quad /:-6$$

$$-y = 1 \quad / \cdot (-1)$$

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

zk: $L_{(-1)}: 3 \cdot (2 - (-1)) - 4 = 3 \cdot 3 - 4 = 5$
 $P_{(-1)}: 3 \cdot (-1+2) + 2 = 3 \cdot 1 + 2 = 5$
 $L = P$

7) $8 \cdot (3x-5) - 5 \cdot (2x-8) = 20 + 4x$

$$24x - 40 - 10x + 40 = 20 + 4x$$

$$14x = 20 + 4x \quad /-4x$$

$$14x - 4x = 20$$

$$10x = 20 \quad /:10$$

$$\underline{x = 2}$$

zk: $L_{(2)}: 8 \cdot (3 \cdot 2 - 5) - 5 \cdot (2 \cdot 2 - 8) = 8 \cdot 1 - 5 \cdot (-4) = 8 + 20 = 28$
 $P_{(2)}: 20 + 4 \cdot 2 = 20 + 8 = 28$
 $L = P$

8) $3x - 5 + 2(1-x) = -(x+2)$

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

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

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

$$2x = 1 \quad /:2$$

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

zk: $L_{(\frac{1}{2})}: 3 \cdot \frac{1}{2} - 5 + 2 \cdot (1 - \frac{1}{2}) = \frac{3}{2} - 5 + 2 \cdot \frac{1}{2} = 1,5 - 5 + 1 = -2,5$
 $P_{(\frac{1}{2})}: -(0,5 + 2) = -2,5$
 $L = P$

01 Jednoduché rovnice 6

Řeš rovnici a proveď zkoušku

1)

$$7 \cdot (y+2) = 6 \cdot (y-1) + 18$$

$$7y + 14 = 6y - 6 + 18$$

$$7y + 14 = 6y + 12 \quad / -6y - 14$$

$$7y - 6y = 12 - 14$$

$$y = -2$$

$$L_{(-2)}: 7 \cdot (-2+2) = 0$$

$$P_{(-2)}: 6 \cdot (-2-1) + 18 = 6 \cdot (-3) + 18 = -18 + 18 = 0$$

$$L=P$$

2)

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

$$5x - 10 = 3x + 9 + 1$$

$$5x - 10 = 3x + 10 \quad / +10 - 3x$$

$$5x - 3x = 10 + 10$$

$$2x = 20 \quad / :2$$

$$x = 10$$

$$L_{(10)}: 5 \cdot (10-2) = 5 \cdot 8 = 40$$

$$P_{(10)}: 3 \cdot (10+3) + 1 = 3 \cdot 13 + 1 = 39 + 1 = 40$$

$$L=P$$

3)

$$7 \cdot (x+4) = 3 \cdot (3+2x) + 20$$

$$7x + 28 = 9 + 6x + 20$$

$$7x + 28 = 6x + 29 \quad / -6x - 28$$

$$7x - 6x = 29 - 28$$

$$x = 1$$

$$L_{(1)}: 7 \cdot (1+4) = 35$$

$$P_{(1)}: 3 \cdot (3+2) + 20 = 3 \cdot 5 + 20 = 15 + 20 = 35$$

$$L=P$$

4)

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

$$5 - 5x - 3x - 3 = 2x + 4 - 2$$

$$-8x + 2 = 2x + 2 \quad / -2x - 2$$

$$-8x - 2x = 2 - 2$$

$$-10x = 0 \quad / :(-10)$$

$$x = 0$$

$$L_{(0)}: 5 \cdot (1) - 3 \cdot 1 = 5 - 3 = 2$$

$$P_{(0)}: 2 \cdot 2 - 2 = 4 - 2 = 2$$

$$L=P$$

5)

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

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

$$7x + 5 = x - 7 \quad / -x - 5$$

$$7x - x = -7 - 5$$

$$6x = -12 \quad / :6$$

$$x = -2$$

$$L_{(-2)}: 2 \cdot [2 \cdot (-2) + 1] + 3 \cdot (-2 + 1) = 2 \cdot (-3) + 3 \cdot (-1)$$

$$= -6 - 3 = -9$$

$$L=P$$

$$P_{(-2)}: 2 \cdot (-2) - 3 - (-2 + 4) = -4 - 3 - 2 = -9$$

6)

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

$$2x + 5 - 1 + x = 15 - 5x - 3$$

$$3x + 4 = -5x + 12 \quad / +5x - 4$$

$$3x + 5x = 12 - 4$$

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

$$x = 1$$

zk:

$$L_{(1)}: 2 + 5 - (1-1) = 7$$

$$L=P$$

$$P_{(1)}: 5 \cdot (3-1) - 3 = 10 - 3 = 7$$

7)

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

$$10x + 25 - 5 + 10x = 15 - 5x$$

$$20x + 20 = 15 - 5x \quad / +5x - 20$$

$$20x + 5x = 15 - 20$$

$$25x = -5 \quad / :5$$

$$5x = -1 \quad / :5$$

$$x = -\frac{1}{5} = -0.2$$

$$L_{(-0.2)}: 5 \cdot (-0.2+5) - 5 \cdot [1-2 \cdot (-0.2)] = 5 \cdot 4.8 - 5 \cdot [1+0.4]$$

$$= 24 - 5 \cdot 1.4 = 24 - 7 = 17$$

$$P_{(-0.2)}: 5 \cdot [3 - (-0.2)] = 5 \cdot 3.2 = 16 \quad L=P$$

8)

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

$$3x - 1 - 2x - 2 = 10x - 15 + 3$$

$$x - 3 = 10x - 12 \quad / -10x + 3$$

$$x - 10x = -12 + 3$$

$$-9x = -9 \quad / :(-9)$$

$$x = 1$$

zk:

$$L_{(1)}: 3 - 1 - 2 \cdot 2 = 3 - 1 - 4 = -2$$

$$P_{(1)}: 5 \cdot (2-3) + 3 = -5 + 3 = -2$$

$$L=P$$

01 Jednoduché rovnice 7

Řeš rovnici a proved' zkoušku

1)

$$\begin{aligned} x[(x+1)-x] &= x \\ x[x+1-x] &= x \\ x[1] &= x \\ x &= x \quad /-x \\ 0 &= 0 \\ \text{NEKONEČNĚ} \\ \text{MNOHO ŘEŠENÍ} \end{aligned}$$

$L(0): 0 \cdot [(0+1)-0] = 0$
 $P(0): 0 = 0 \quad L(0) = P(0)$
 $L(1): 1 \cdot [(1+1)-1] = 1 \cdot 1 = 1$
 $P(1): 1 = 1 \quad L(1) = P(1)$

2)

$$\begin{aligned} x-3[x-5(x-4)] &= 10(x-3) \\ x-3[-4x+20] &= 10x-30 \\ x+12x-60 &= 10x-30 \\ 13x-60 &= 10x-30 \quad /-10x+60 \\ 3x &= 30 \quad /:3 \\ x &= 10 \end{aligned}$$

$L(10): 10-3 \cdot [10-5 \cdot (10-4)] = 10-3 \cdot [10-30] = 10+60 = 70$
 $P(10): 10 \cdot (10-3) = 70$
 $L(10) = P(10)$

3)

$$\begin{aligned} (x-1)^2 &= (x+1)^2 \\ x^2-2x+1 &= x^2+2x+1 \\ x^2-x^2-2x+1 &= 2x+1 \\ -2x+1 &= 2x+1 \quad /-2x-1 \\ -2x-2x &= 1-1 \\ -4x &= 0 \quad /:-4 \\ x &= 0 \end{aligned}$$

$L(0): (0-1)^2 = (-1)^2 = 1$
 $P(0): (0+1)^2 = 1^2 = 1$
 $L(0) = P(0)$

4)

$$\begin{aligned} (x+4)^2 &= (x+2)^2 \\ x^2+8x+16 &= x^2+4x+4 \\ 8x+16 &= 4x+4 \quad /-4x-16 \\ 4x &= -12 \quad /:4 \\ x &= -3 \end{aligned}$$

$L(-3): (-3+4)^2 = 1^2 = 1$
 $P(-3): (-3+2)^2 = (-1)^2 = 1$
 $L(-3) = P(-3)$

5)

$$\begin{aligned} (x-1) \cdot (x-1) &= (x+2) \cdot (x-2) + x \\ x^2-x-x+1 &= x^2-2x+2x-4+x \\ x^2-2x+1 &= x^2+x-4 \quad /-x^2 \\ -2x+1 &= x-4 \quad /-x-1 \\ -2x-x &= -4-1 \\ -3x &= -5 \quad /:-3 \\ x &= \frac{5}{3} \end{aligned}$$

$L(\frac{5}{3}): (\frac{5}{3}-1) \cdot (\frac{5}{3}-1) = (\frac{2}{3}) \cdot (\frac{2}{3}) = \frac{4}{9}$
 $P(\frac{5}{3}): (\frac{5}{3}+2) \cdot (\frac{5}{3}-2) + \frac{5}{3} = \frac{11}{3} \cdot (-\frac{1}{3}) + \frac{5}{3} = -\frac{11}{9} + \frac{5}{3} = -\frac{11}{9} + \frac{15}{9} = \frac{4}{9}$
 $L(\frac{5}{3}) = P(\frac{5}{3})$

6)

$$\begin{aligned} (x+2) \cdot (x-3) - (x+3) \cdot (x-2) &= 0 \\ x^2-3x+2x-6 - x^2+2x-3x+6 &= 0 \\ -2x &= 0 \quad /:-2 \\ x &= 0 \end{aligned}$$

$L(0): 2 \cdot (-3) - 3 \cdot (-2) = -6+6 = 0$
 $P(0): 0 = 0$
 $L(0) = P(0)$

7)

$$\begin{aligned} (x+2) \cdot (x-3) - (x+2) \cdot (x-4) &= 7 \\ x^2-3x+2x-6 - [x^2-4x+2x-8] &= 7 \\ x^2-3x+2x-6 - x^2+4x-2x+8 &= 7 \\ x+2 &= 7 \quad /-2 \\ x &= 5 \end{aligned}$$

$L(5): 7 \cdot 2 - 7 \cdot 1 = 14-7 = 7$
 $P(5): 7 = 7$
 $L(5) = P(5)$

8)

$$\begin{aligned} (x+3) \cdot (x-2) &= 3[x-1] \cdot (x+5) - 2(x^2+1) \\ x^2-2x+3x-6 &= 3[x^2+5x-x-5] - 2x^2-2 \\ x^2-2x+3x-6 &= 3x^2+15x-3x-15 - 2x^2-2 \\ x^2+x-6 &= x^2+12x-17 \quad /-x^2 \\ x-6 &= 12x-17 \quad /-12x+6 \\ -11x &= -11 \quad /:-11 \\ x &= 1 \end{aligned}$$

$L(1): 4 \cdot (-1) = -4$
 $P(1): 3 \cdot 0 \cdot 6 - 2 \cdot (1+1) = -2 \cdot 2 = -4$
 $L(1) = P(1)$

02 Rovnice se zlomky 1

Řeš rovnici

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

$$x = 1$$

$$2x = 1 \quad / :2$$

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

$$\frac{1}{2}x = \frac{1}{2} \quad / \cdot 2$$

$$x = 1$$

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

$$x = 12$$

$$\frac{1}{3}x = 3 \quad / \cdot 3$$

$$x = 9$$

$$-\frac{3x}{2} = -6 \quad / \cdot (-1)$$

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

$$3x = 12 \quad / :3$$

$$x = 4$$

$$\frac{5y}{2} = -15 \quad / \cdot 2$$

$$5y = -30 \quad / :5$$

$$y = -6$$

$$\frac{7x}{4} - 3 = 4 \quad / +3$$

$$\frac{7x}{4} = 4 + 3$$

$$\frac{7x}{4} = 7 \quad / \cdot 4$$

$$7x = 28 \quad / :7$$

$$x = 4$$

$$\frac{x}{7} = \frac{2}{7} + 1$$

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

$$\frac{x}{7} = \frac{9}{7} \quad / \cdot 7$$

$$x = 9$$

$$\frac{x}{7} - \frac{2}{7} = 1 \quad / + \frac{2}{7}$$

$$\frac{x}{7} = 1 + \frac{2}{7}$$

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

$$\frac{x}{7} = \frac{9}{7} \quad / \cdot 7$$

$$x = 9$$

$$7 \cdot \left(\frac{x-2}{7} \right) = (1) \cdot 7 \quad / \cdot 7$$

$$x - 2 = 7 \quad / +2$$

$$x = 7 + 2$$

$$x = 9$$

$$7 \cdot \left(\frac{x}{7} - \frac{2}{7} \right) = 1 \cdot 7 \quad / \cdot 7$$

$$x - 2 = 7 \quad / +2$$

$$x = 7 + 2$$

$$x = 9$$

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

$$y+3 = 6 \quad / -3$$

$$y = 6-3$$

$$y = 3$$

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

$$x+1 = 2 \quad / -1$$

$$x = 2-1$$

$$x = 1$$

$$\frac{1}{3} + \frac{y}{2} = \frac{5}{6} \quad / \cdot 6$$

$$2 \cdot \frac{1}{3} + 3 \cdot \frac{y}{2} = 5 \cdot \frac{5}{6}$$

$$2 + 3y = 5 \quad / -2$$

$$3y = 5-2$$

$$3y = 3 \quad / :3$$

$$y = 1$$

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

$$1 \cdot \frac{x-2}{4} + 2 \cdot \frac{1}{2} = 4 \cdot 2$$

$$x-2+2 = 8$$

$$x = 8$$

$$\frac{z}{3} + 1 = \frac{5}{2} \quad / \cdot 6$$

$$2 \cdot \frac{z}{3} + 6 \cdot 1 = 6 \cdot \frac{5}{2}$$

$$2z + 6 = 15 \quad / -6$$

$$2z = 15-6$$

$$2z = 9 \quad / :2$$

$$z = \frac{9}{2}$$

$$\frac{z}{3} + \frac{3}{3} = \frac{5}{2} \quad / \cdot 6$$

$$2 \cdot \frac{z}{3} + 2 \cdot \frac{3}{3} = 6 \cdot \frac{5}{2}$$

$$2z + 6 = 15 \quad / -6$$

$$2z = 15-6$$

$$2z = 9 \quad / :2$$

$$z = \frac{9}{2}$$

$$\frac{z+3}{3} = \frac{5}{2} \quad / \cdot 6$$

$$2 \cdot \frac{z+3}{3} = 6 \cdot \frac{5}{2}$$

$$2 \cdot (z+3) = 15$$

$$2z + 6 = 15 \quad / -6$$

$$2z = 15-6$$

$$2z = 9 \quad / :2$$

$$z = \frac{9}{2}$$

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

$$2 \cdot \frac{z+3}{3} = 3 \cdot \frac{z+3}{2}$$

$$2 \cdot (z+3) = 3 \cdot (z+3)$$

$$2z + 6 = 3z + 9 \quad / -2z-9$$

$$6-9 = 3z-2z$$

$$-3 = z$$

02 Rovnice se zlomky 2

Řeš rovnici a proved' zkoušku

1)

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

$$6x-12 = x-2 \quad / -x+12$$

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

$$5x = 10 \quad / :5$$

$$x = 2$$

$$ZK: L(2): 2-2=0$$

$$P(2): \frac{2-2}{6}=0$$

$L=P$

2)

$$\frac{y+5}{2} = \frac{y+6}{3} \quad / \cdot 6$$

$$3 \cdot \frac{y+5}{2} = \frac{2}{6} \cdot \frac{y+6}{3}$$

$$3 \cdot (y+5) = 2 \cdot (y+6)$$

$$3y+15 = 2y+12$$

$$3y-2y = 12-15$$

$$y = -3$$

$$/ -2y-15$$

$$ZK: L(-3): \frac{-3+5}{2} = \frac{2}{2} = 1$$

$$P(-3): \frac{-3+6}{3} = \frac{3}{3} = 1$$

$L=P$

3)

$$3x = \frac{7x+18}{3} \quad / \cdot 3$$

$$9x = 7x+18 \quad / -7x$$

$$9x-7x = 18$$

$$2x = 18$$

$$/ :2$$

$$x = 9$$

$ZK:$

$$L(9): 3 \cdot 9 = 27$$

$$P(9): \frac{63+18}{3} = \frac{81}{3} = 27$$

$L=P$

4)

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

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

$$3x-6 = 7+2x$$

$$3x-2x = 7+6$$

$$x = 13$$

$$/ +6-2x$$

$ZK:$

$$L(13): 13-2=11$$

$$P(13): 1 + \frac{4+26}{3} = 1 + \frac{30}{3} = 1+10=11$$

$L=P$

5)

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

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

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

$$4x-10 = 3x-7$$

$$4x-3x = -7+10$$

$$x = 3$$

$$L(3): \frac{6-5}{2} = \frac{1}{2}$$

$$P(3): \frac{9-7}{4} = \frac{2}{4} = \frac{1}{2}$$

$L=P$

6)

$$\frac{x+4}{5} = \frac{x-2}{2} \quad / \cdot 10$$

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

$$2x+8 = 5x-10$$

$$2x-5x = -10-8$$

$$-3x = -18$$

$$-x = -6$$

$$x = 6$$

$$/ -5x-8$$

$$/ :3$$

$$/ (-1)$$

$ZK:$

$$L(6): \frac{6+4}{5} = \frac{10}{5} = 2$$

$$P(6): \frac{6-2}{2} = \frac{4}{2} = 2$$

$L=P$

7)

$$3 - \frac{3y-3}{2} = 0 \quad / \cdot 2$$

$$3 \cdot 2 - \frac{3y-3}{2} = 0$$

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

$$6-3y+3=0$$

$$-3y+9=0$$

$$9=3y$$

$$3=y$$

$$/ +3y$$

$$/ :3$$

$$ZK: L(3): 3 - \frac{3 \cdot 3 - 3}{2} = 3 - \frac{9-3}{2} = 3 - \frac{6}{2} = 3-3=0$$

$$P(3): 0$$

$L=P$

8)

$$\frac{2z}{5} - \frac{3z-2}{2} = 1 \quad / \cdot 10$$

$$2 \cdot 2z - 5 \cdot (3z-2) = 10$$

$$4z - 15z + 10 = 10$$

$$-11z = 10-10$$

$$-11z = 0$$

$$z = 0$$

$$/ -10$$

$$/ (-11)$$

$ZK:$

$$L(0): \frac{2 \cdot 0}{5} - \frac{3 \cdot 0 - 2}{2} = 0 - \frac{-2}{2} = \frac{2}{2} = 1$$

$$P(0): 1$$

$L=P$

02 Rovnice se zlomky 3

Řeš rovnici a proved' zkoušku

1)

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

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

$$6x - 18 + 4 = 6x - 3$$

Numerická chyba
nemá vliv na výsledek

$$6x - 12 = 6x - 3 \quad / -6x + 12$$

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

$$0 = 9$$

ROVNICE NEMÁ ŘEŠENÍ

2)

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

$$4 \cdot (x+4) + 6 \cdot (x-1) = 12 + 3 \cdot (x+4)$$

$$4x + 16 + 6x - 6 = 12 + 3x + 12$$

$$10x + 10 = 3x + 24 \quad / -3x - 10$$

$$10x - 3x = 24 - 10$$

$$7x = 14 \quad / : 7$$

$$x = 2$$

$$ZL: L(2) : \frac{6}{3} + \frac{2-1}{2} = 2 + \frac{1}{2} = 2,5 \quad \left(\frac{5}{2}\right)$$

$$P(2) : 1 + \frac{2+4}{4} = 1 + \frac{6}{4} = 1 + \frac{3}{2} = 1 + 1,5 = 2,5 \quad \left(\frac{5}{2}\right)$$

$$L = P$$

3)

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

$$3 \cdot (x-2) - 4 \cdot (x-5) = 12x + x$$

$$3x - 6 - 4x + 20 = 13x$$

$$-x + 14 = 13x \quad / + x$$

$$14 = 14x \quad / : 14$$

$$1 = x$$

$$ZL: L(1) : \frac{1-2}{4} - \frac{1-5}{3} = -\frac{1}{4} - \frac{(-4)}{3} = \frac{-3+16}{12} = \frac{13}{12}$$

$$P(1) : 1 + \frac{1}{12} = \frac{12}{12} + \frac{1}{12} = \frac{13}{12} \quad L = P$$

4)

$$\frac{3x-1}{3} + \frac{2x+3}{5} = \frac{11x-6}{15} \quad / \cdot 15$$

$$5 \cdot (3x-1) + 3 \cdot (2x+3) = 11x - 6$$

$$15x - 5 + 6x + 9 = 11x - 6$$

$$21x + 4 = 11x - 6 \quad / -11x - 4$$

$$21x - 11x = -6 - 4$$

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

$$x = -1$$

$$ZL: L(-1) : \frac{-3-1}{3} + \frac{-2+3}{5} = -\frac{4}{3} + \frac{1}{5} = \frac{-20}{15} + \frac{3}{15} = -\frac{17}{15}$$

$$P(-1) : \frac{-11-6}{15} = -\frac{17}{15} \quad L = P$$

5)

$$\frac{x+1}{2} - \frac{2-x}{3} = \frac{5x-1}{6} \quad / \cdot 6$$

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

$$3x + 3 - 4 + 2x = 5x - 1$$

$$5x - 1 = 5x - 1 \quad / -5x + 1$$

$$5x - 5x = -1 + 1$$

$$0 = 0$$

ROVNICE MÁ NEKONEČNĚ
MNOHO ŘEŠENÍ

6)

$$\frac{3x-1}{3} - \frac{-x+1}{x-1} = \frac{3x-2}{6} - \frac{x}{2} \quad / \cdot 6$$

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

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

$$4 = -2$$

ROVNICE NEMÁ ŘEŠENÍ

Procvičování: Rovnice se zkouškou 1

Najdi řešení rovnice a proved' zkoušku

1)

$$11 - 5x = 2 \cdot (7x - 4)$$

$$11 - 5x = 14x - 8 \quad / -14x - 11$$

$$-5x - 14x = -8 - 11$$

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

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

$$x = 1$$

zk

$$L_{(1)}: 11 - 5 = 6$$

$$P_{(1)}: 2 \cdot (7 - 4) = 2 \cdot 3 = 6 \quad L = P$$

2)

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

$$6x = 2x + 12 - 5 + 4x$$

$$6x = 6x + 7 \quad / -6x$$

$$6x - 6x = 7$$

$$0 = 7$$

NEMÁ ŘEŠENÍ

3)

$$5 - 5(t + 4) = 2(t + 3)$$

$$5 - 5t - 20 = 2t + 6$$

$$-5t - 15 = 2t + 6 \quad / -2t + 15$$

$$-5t - 2t = 6 + 15$$

$$-7t = 21 \quad / :7$$

$$-t = 3 \quad / \cdot (-1)$$

$$t = -3$$

zk:

$$L_{(-3)}: 5 - 5 \cdot (-3 + 4) = 5 - 5 \cdot 1 = 0$$

$$P_{(-3)}: 2 \cdot (-3 + 3) = 2 \cdot 0 = 0$$

L = P

4)

$$r - 7(2r - 7) = 9 - 5r$$

$$r - 14r + 49 = 9 - 5r$$

$$-13r + 49 = 9 - 5r \quad / +5r - 49$$

$$-13r + 5r = 9 - 49$$

$$-8r = -40 \quad / :(-8)$$

$$r = 5$$

$$L_{(5)}: 5 - 7 \cdot (10 - 7) = 5 - 7 \cdot 3 = 5 - 21 = -16$$

$$P_{(5)}: 9 - 5 \cdot 5 = 9 - 25 = -16 \quad L = P$$

5)

$$3x - (5x + 6) - 4(1 - x) = 2 + 9(x + 1)$$

$$3x - 5x - 6 - 4 + 4x = 2 + 9x + 9$$

$$2x - 10 = 9x + 11 \quad / -9x + 10$$

$$2x - 9x = 11 + 10$$

$$-7x = 21 \quad / :7$$

$$-x = 3 \quad / \cdot (-1)$$

$$x = -3$$

zk:

$$L_{(-3)}: -3 - (-15 + 6) - 4 \cdot (1 - (-3)) = -3 - (-9) - 4 \cdot (4) = -3 + 9 - 16 = -10$$

$$P_{(-3)}: 2 + 9 \cdot (-3 + 1) = 2 + 9 \cdot (-2) = 2 - 18 = -16$$

L = P

6)

$$2(14 - 3x) - (4x + 5) = x - [6x - 4(x - 1)]$$

$$28 - 6x - 4x - 5 = x - 6x + 4x - 4$$

$$-10x + 23 = -x - 4 \quad / +x - 23$$

$$-10x + x = -4 - 23$$

$$-9x = -27 \quad / :(-9)$$

$$x = 3$$

zk

$$L_{(3)}: 2 \cdot (14 - 3) - (12 + 5) = 2 \cdot 11 - 17 = 22 - 17 = 5$$

$$P_{(3)}: 3 - [18 - 4 \cdot (3 - 1)] = 3 - [18 - 8] = 3 - 10 = -7$$

L = P

Procvičování: Rovnice se zkouškou 2

Najdi řešení rovnice a proved' zkoušku

$$1) \quad 6(2b-3) = 10-4(5-3b)-2(3b+1)$$

$$12b - 18 = 10 - 20 + 12b - 6b - 2$$

$$12b - 18 = -12 + 6b \quad /-6b + 18$$

$$12b - 6b = -12 + 18$$

$$6b = 6 \quad /:6$$

$$\underline{b = 1}$$

zk:

$$L_{(1)}: 6 \cdot (2-3) = 6 \cdot (-1) = -6$$

$$P_{(1)}: 10 - 4 \cdot (5-3 \cdot 1) - 2 \cdot (3 \cdot 1 + 1) = 10 - 4 \cdot 2 - 2 \cdot 4 = 10 - 8 - 8 = -6 \quad \angle = P$$

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

$$12x^2 + 6x - 10x - 5 = 12x^2 - 8x - 3x + 2 \quad /-12x^2$$

$$12x^2 - 12x^2 - 4x - 5 = -11x + 2 \quad /+11x + 5$$

$$-4x + 11x = 2 + 5$$

$$7x = 7 \quad /:7$$

$$\underline{x = 1}$$

zk

$$L_{(1)}: (6-5) \cdot (2+1) = 1 \cdot 3 = 3$$

$$P_{(1)}: (4-1) \cdot (3-2) = 3 \cdot 1 = 3 \quad \angle = P$$

$$3) \quad (8y+11)(2-y) = (4y+6)(6-2y)$$

$$16y - 8y^2 + 22 - 11y = 24y - 8y^2 + 36 - 12y \quad /+8y^2$$

$$-8y^2 + 8y^2 + 5y + 22 = 12y + 36 \quad /-5y - 36$$

$$22 - 36 = 12y - 5y$$

$$-14 = 7y \quad /:7$$

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

$$zk \quad L_{(-2)}: (-16 + 11) \cdot [2 - (-2)] = -5 \cdot 4 = -20$$

$$P_{(-2)}: (-8 + 6) \cdot [6 - 2 \cdot (-2)] = -2 \cdot 10 = -20$$

$$4) \quad (2u+7)(2u+7) \quad \text{Neb. } (A+B)^2 = A^2 + 2AB + B^2$$

$$(2u+7)^2 - 4 = (u+4)(4u+15)$$

$$4u^2 + 28u + 49 - 4 = 4u^2 + 15u + 16u + 60 \quad /-4u^2$$

$$4u^2 - 4u^2 + 28u + 45 = 31u + 60 \quad /-31u - 45$$

$$28u - 31u = 60 - 45$$

$$-3u = 15 \quad /:(-3)$$

$$\underline{u = -5}$$

zk:

$$L_{(-5)}: (-10+7)^2 - 4 = (-3)^2 - 4 = 9 - 4 = 5$$

$$P_{(-5)}: (-5+4) \cdot (-20+15) = -1 \cdot (-5) = 5 \quad \angle = P$$

$$5) \quad 4x+1 = 4 \cdot (4x+0,25)$$

$$4x + 1 = 16x + 1 \quad /-16x - 1$$

$$4x - 16x = 1 - 1$$

$$-12x = 0 \quad /:(-12)$$

$$\underline{x = 0}$$

$$L_{(0)}: 0 + 1 = 1$$

$$P_{(0)}: 4 \cdot (0 + 0,25) = 1 \quad \angle = P$$

$$6) \quad x+2 = \frac{6x+7}{5} \quad / \cdot 5$$

$$5x + 10 = 6x + 7$$

$$5x + 10 = 6x + 7 \quad /-6x - 10$$

$$5x - 6x = 7 - 10$$

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

$$\underline{x = 3}$$

zk

$$L_{(3)}: 3 + 2 = 5$$

$$P_{(3)}: \frac{6 \cdot 3 + 7}{5} = \frac{18 + 7}{5} = \frac{25}{5} = 5 \quad \angle = P$$

Procvičování: Rovnice se zkouškou 3
Najdi řešení rovnice a proved' zkoušku

1)

$$\frac{3c+14}{4}=2 \quad / \cdot 4$$

$$3c+14=8 \quad / -14$$

$$3c=8-14$$

$$3c=-6 \quad / :3$$

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

$$ZK: L_{(-2)}: \frac{-6+14}{4} = \frac{8}{4} = 2$$

$$P_{(-2)}: 2 \quad L=P$$

2)

$$\frac{b-4}{3} = \frac{9-b}{2} \quad / \cdot 6$$

$$2 \cdot (b-4) = 3 \cdot (9-b)$$

$$2b-8 = 27-3b \quad / +3b +8$$

$$2b+3b = 27+8$$

$$5b = 35 \quad / :5$$

$$\underline{b=7}$$

$$ZK: L_{(7)}: \frac{7-4}{3} = \frac{3}{3} = 1 \quad P_{(7)}: \frac{9-7}{2} = \frac{2}{2} = 1$$

3)

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

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

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

$$3 \cdot 2 \cdot (x+1) - 12 = 4 \cdot (x-1)$$

$$III) \quad 2 \cdot \frac{x+1}{4} - x = \frac{x-1}{3}$$

$$\frac{x+1}{2} - x = \frac{x-1}{3} \quad / \cdot 6$$

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

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

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

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

$$-5x=-5 \quad / :(-5)$$

$$\underline{x=1}$$

$$ZK: L_{(1)}: 2 \cdot \frac{1+1}{4} - 1 = 2 \cdot \frac{2}{4} - 1 = \frac{4}{4} - 1 = 1 - 1 = 0$$

$$P_{(1)}: \frac{1-1}{3} = 0 \quad L=P$$

4)

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

$$30 - 2 \cdot (3-2y) = 20y$$

$$30 - 6 + 4y = 20y$$

$$24 + 4y = 20y \quad / -4y$$

$$24 = 20y - 4y$$

$$24 = 16y \quad / :8$$

$$3 = 2y \quad / :2$$

$$\underline{\frac{3}{2} = y}$$

$$ZK: L_{(\frac{3}{2})}: 6 - \frac{3-2 \cdot \frac{3}{2}}{5} \cdot 2 = 6 - 0 = 6$$

$$P_{(\frac{3}{2})}: 4 \cdot \frac{3}{2} = 6$$

$$L=P$$

5)

$$\frac{9}{5} + t = \frac{t}{2} + \frac{4}{5} \quad / \cdot 10$$

$$18 + 10t = 5t + 8 \quad / -5t - 18$$

$$10t - 5t = 8 - 18$$

$$5t = -10$$

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

$$ZK: L_{(-2)}: \frac{9}{5} - 2 = \frac{9}{5} - \frac{10}{5} = -\frac{1}{5}$$

$$P_{(-2)}: -\frac{2}{2} + \frac{4}{5} = -1 + \frac{4}{5} = -\frac{5}{5} + \frac{4}{5} = -\frac{1}{5} \quad L=P$$

6)

$$\frac{6x-5}{3} = 2x - \frac{10}{3} \quad / \cdot 3$$

$$6x-5 = 6x-10 \quad / -6x +5$$

$$6x-6x = -10+5$$

$$0 = -5$$

NEMÁ ŘEŠENÍ

Procvičování: Rovnice se zkouškou 4
Najdi řešení rovnice a proved' zkoušku

1)

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

$$3 \cdot (x-2) - 6x = 12 - 4x$$

$$3x - 6 - 6x = 12 - 4x$$

$$-6 - 3x = 12 - 4x \quad / +4x + 6$$

$$-3x + 4x = 12 + 6$$

$$x = 18$$

$$ZK: L_{(18)}: \frac{18-2}{2} - 18 = \frac{16}{2} - 18 = 8 - 18 = -10$$

$$P_{(18)}: 2 - \frac{2 \cdot 18}{3} = 2 - 12 = -10 \quad L = P$$

2)

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

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

$$3x - 15 + 6x = 4x - 5$$

$$-15 + 3x = 4x - 5 \quad / -4x + 15$$

$$3x - 4x = -5 + 15$$

$$-x = 10$$

$$x = -10$$

$$ZK: L_{(-10)}: \frac{-10-5}{2} + (-10) = -\frac{15}{2} - 10 = -\frac{35}{2} = -17.5$$

$$P_{(-10)}: \frac{2 \cdot (-10)}{3} - \frac{5}{6} = -\frac{40}{3} - \frac{5}{6} = -\frac{80}{6} - \frac{5}{6} = -\frac{85}{6} \approx -14.17$$

3)

$$\frac{16-5t}{7} = \frac{t+7}{2} \quad / \cdot 14$$

$$2 \cdot (16-5t) = 7 \cdot (t+7)$$

$$32 - 10t = 7t + 49 \quad / -7t - 32$$

$$-10t - 7t = 49 - 32$$

$$-17t = 17 \quad / : (-17)$$

$$t = -1$$

$$ZK: L_{(-1)}: \frac{16-5 \cdot (-1)}{7} = \frac{16+5}{7} = \frac{21}{7} = 3$$

$$P_{(-1)}: \frac{-1+7}{2} = \frac{6}{2} = 3 \quad L = P$$

4)

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

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

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

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

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

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

$$x = -1$$

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

$$ZK: L_{(-1)}: \frac{2}{3} \cdot (-1+1) = \frac{2}{3} \cdot 0 = 0$$

$$P_{(-1)}: -\frac{1}{3} \cdot (-2-1) - 1 = -\frac{1}{3} \cdot (-3) - 1 = 1 - 1 = 0$$

5)

$$\frac{3x-10}{3} - \frac{x}{2} + \frac{2x-13}{6} = 0 \quad / \cdot 6$$

$$2 \cdot (3x-10) - 3x + (2x-13) = 0$$

$$6x - 20 - 3x + 2x - 13 = 0$$

$$x - 7 = 0 \quad / + 7$$

$$x = 7$$

$$ZK: L_{(7)}: \frac{21-10}{3} - \frac{7}{2} + \frac{14-13}{6} = \frac{11}{3} - \frac{7}{2} + \frac{1}{6} = \frac{22-21+1}{6} = \frac{0}{6} = 0$$

$$P_{(7)}: 0 \quad L = P$$

6)

$$\frac{5x-2}{4} = 1,25x - \frac{1}{2} \quad / \cdot 4$$

$$5x - 2 = 5x - 2 \quad / -5x + 2$$

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

$$0 = 0$$

NEKONEČNĚ MNOHO
ŘEŠENÍ

Procvičování: Rovnice se zkouškou 5

Najdi řešení rovnice a proved' zkoušku

1)

$$\frac{2x}{3} = \frac{5}{12}$$

$$\cdot 12$$

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

$$-4x = 5 \quad \cdot (-4)$$

$$x = -\frac{5}{4}$$

$$\text{II) } -\frac{x}{3} = \frac{5}{12} \quad \cdot 3$$

$$-x = \frac{5}{4} \quad \cdot (-1)$$

$$x = -\frac{5}{4}$$

zk:

$$L(-\frac{5}{4}): \frac{2 \cdot (-\frac{5}{4})}{3} = -\frac{1}{3} \cdot (-\frac{5}{4}) = \frac{5}{12}$$

$$-\frac{5}{4} : 1 = -\frac{5}{4} \cdot \frac{1}{1} = -\frac{5}{4}$$

$$P(-\frac{5}{4}): \frac{5}{12}$$

2)

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

$$3 \cdot (1-x) = 24 - 6x + 10x$$

$$3 - 3x = 24 + 4x \quad \cdot (-4x - 3)$$

$$-3x - 4x = 24 - 3$$

$$-7x = 21 \quad \cdot (-7)$$

$$x = -3$$

zk

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

$$P(-3): 4 - (-3) + \frac{5 \cdot (-3)}{3} = 4 + 3 - 5 = 2 \quad L=P$$

3)

$$1 - \frac{7c-4}{9} - \frac{5-3c}{6} = \frac{c}{3} \quad \cdot 18$$

$$18 - 2 \cdot (7c-4) - 3 \cdot (5-3c) = 6c$$

$$18 - 14c + 8 - 15 + 9c = 6c$$

$$11 - 5c = 6c \quad \cdot 5c$$

$$11 = 6c + 5c$$

$$11 = 11c \quad \cdot 11$$

$$1 = c$$

zk:

$$L(1): 1 - \frac{7 \cdot 1 - 4}{9} - \frac{5 - 3 \cdot 1}{6} = 1 - \frac{3}{9} - \frac{2}{6} = 1 - \frac{1}{3} - \frac{1}{3} = \frac{1}{3}$$

$$P(1): \frac{1}{3} \quad L=P$$

4)

$$\frac{6-t}{4} - 3 = \frac{2t+6}{7} - \frac{t+4}{2} \quad \cdot 28$$

$$7 \cdot (6-t) - 84 = 4 \cdot (2t+6) - 14 \cdot (t+4)$$

$$42 - 7t - 84 = 8t + 24 - 14t - 56$$

$$-7t - 42 = -6t - 32 \quad \cdot 6t + 42$$

$$-7t + 6t = -32 + 42$$

$$-t = 10 \quad \cdot (-1)$$

$$t = -10$$

zk

$$L(-10): \frac{6 - (-10)}{4} - 3 = \frac{16}{4} - 3 = 4 - 3 = 1$$

$$P(-10): \frac{-20+6}{7} - \frac{-10+4}{2} = \frac{-14}{7} - \frac{(-6)}{2} = -2 + 3 = 1 \quad L=P$$

5)

$$\frac{2-x}{2} - 3 = \frac{2x+1}{3} \quad \cdot 6$$

$$3 \cdot (2-x) - 18 = 2 \cdot (2x+1)$$

$$6 - 3x - 18 = 4x + 2$$

$$-3x - 12 = 4x + 2 \quad \cdot (-4x + 12)$$

$$-3x - 4x = 2 + 12$$

$$-7x = 14 \quad \cdot (-7)$$

$$x = -2$$

zk

$$L(-2): \frac{2 - (-2)}{2} - 3 = \frac{4}{2} - 3 = 2 - 3 = -1$$

$$P(-2): \frac{-4+1}{3} = \frac{-3}{3} = -1 \quad L=P$$

6)

↪ Zjednot' člen

$$2 \cdot \frac{x-1}{9} - \frac{2x+3}{6} = \frac{1}{2} \quad \cdot 18$$

$$2 \cdot 2 \cdot \frac{x-1}{9} - 3 \cdot \frac{2x+3}{6} = 9$$

$$4x - 4 - 6x - 9 = 9$$

$$-2x - 13 = 9 \quad \cdot 13$$

$$-2x = 9 + 13$$

$$-2x = 22 \quad \cdot (-2)$$

$$x = -11$$

zk

$$L(-11): 2 \cdot \frac{-11-1}{9} - \frac{-22+3}{6} = \frac{-24}{9} - \frac{-19}{6} = -\frac{8}{3} + \frac{19}{6} = -\frac{16}{6} + \frac{19}{6} = \frac{3}{6} = \frac{1}{2}$$

$$P(-11): \frac{1}{2} \quad L=P$$

$$:0,2 \rightarrow : \frac{2}{10} \rightarrow : \frac{10}{2} \rightarrow : 5$$

Procvičování: Rovnice se zkouškou 6

Najdi řešení rovnice a proved' zkoušku

1) $\rightarrow (x-2) \cdot 0,2 = (x-2) \cdot \frac{1}{5} = (x-2) \cdot 5$

$$\frac{x-2}{0,2} + 0,6 = x + \frac{1}{5}$$

$$5 \cdot (x-2) + 0,6 = x + \frac{1}{5}$$

$$5x - 10 + 0,6 = x + \frac{1}{5} \quad / \cdot 5$$

$$25x - 50 + 3 = 5x + 1 \quad / -5x + 47$$

$$20x - 5x = 1 + 47$$

$$20x = 48 \quad / : 2$$

$$10x = 24 \quad / : 10$$

$$x = 2,4$$

zk $L_{(2,4)}: \frac{2,4-2}{0,2} + 0,6 = \frac{0,4}{0,2} + 0,6 = 2 + 0,6 = 2,6$

$P_{(2,4)} = 2,4 + \frac{1}{5} = 2,4 + 0,2 = 2,6$

2)

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

$$(y-2) \cdot 4 - 6 = 3 \cdot 2 \cdot (y-3)$$

$$4y - 8 - 6 = 6y - 18$$

$$4y - 14 = 6y - 18 \quad / +14 -6y$$

$$4y - 6y = -18 + 14$$

$$-2y = -4 \quad / : (-2)$$

$$y = 2$$

zk

$L_{(2)}: \frac{(2-2) \cdot 4}{3} - 2 = \frac{0 \cdot 4}{3} - 2 = 0 - 2 = -2$

$P_{(2)}: 2 \cdot (2-3) = 2 \cdot (-1) = -2$

3)

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

$$4 \cdot (v-5) + 10 \cdot (1+v) = 20 + 5 \cdot 3 \cdot (v-3)$$

$$4v - 20 + 10 + 10v = 20 + 15v - 45$$

$$14v - 10 = -25 + 15v \quad / -15v + 10$$

$$14v - 15v = -25 + 10$$

$$-v = -15 \quad / \cdot (-1)$$

$$v = 15$$

zk

$L_{(15)}: \frac{15-5}{5} + \frac{1+15}{2} = \frac{10}{5} + \frac{16}{2} = 2 + 8 = 10$

$P_{(15)}: 1 + \frac{3 \cdot (15-3)}{4} = 1 + \frac{3 \cdot 12}{4} = 1 + 3 \cdot 3 = 1 + 9 = 10$

$L=P$

4)

$$7a \cdot (a-1) - 17 = 3a \cdot (2a+5) + a \cdot a + 5$$

$$7a^2 - 7a - 17 = 6a^2 + 15a + a^2 + 5 \quad / -6a^2 - a^2$$

$$7a^2 - 6a^2 - a^2 - 7a - 17 = 15a + 5 \quad / -15a + 17$$

$$-7a - 15a = 5 + 17$$

$$-22a = 22 \quad / : (-22)$$

$$a = -1$$

zk

$L_{(-1)}: -7 \cdot (-1-1) - 17 = -7 \cdot (-2) - 17 = 14 - 17 = -3$

$P_{(-1)}: -3 \cdot (-2+5) - 1 \cdot (-1) + 5 = -3 \cdot 3 + 1 + 5 = -9 + 6 = -3$

$L=P$

5)

$$2v \cdot (2v-1) = 4v \cdot (3+v) - 7$$

$$4v^2 - 2v = 12v + 4v^2 - 7 \quad / -4v^2$$

$$4v^2 - 4v^2$$

$$-2v = 12v - 7 \quad / -12v$$

$$-2v - 12v = -7$$

$$-14v = -7 \quad / : (-7)$$

$$2v = 1 \quad / : 2$$

$$v = \frac{1}{2} = 0,5$$

zk:

$L_{(0,5)}: 1 \cdot (1-1) = 1 \cdot 0 = 0$

$P_{(0,5)}: 2 \cdot (3+0,5) - 7 = 2 \cdot 3,5 - 7 = 7 - 7 = 0$

$L=P$

6)

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

$$3(x+3) - 2 \cdot (2x+5) = 48$$

$$3x + 9 - 4x - 10 = 48$$

$$-x - 1 = 48 \quad / +1$$

$$-x = 48 + 1$$

$$-x = 49 \quad / \cdot (-1)$$

$$x = -49$$

zk $L_{(-49)}: \frac{-49+3}{2} - \frac{2 \cdot (-49)+5}{3} = -\frac{46}{2} - \frac{(-93)}{3} = -23 + 31 = 8$

$P_{(-49)}: 8$

$L=P$

Procvičování: Rovnice se zkouškou 7

Najdi řešení rovnice a proved' zkoušku

1)

$$3,5x - \frac{15}{3} = 7 + \frac{x}{2} \quad / \cdot 6 \quad \rightarrow 3,5x - 5 = 7 + \frac{x}{2} \quad / \cdot 2$$

$$21x - 30 = 42 + 3x \quad / -3x + 30$$

$$18x = 72 \quad / : 9$$

$$2x = 8 \quad / : 2$$

$$x = 4$$

zk $L(4): 3,5 \cdot 4 - \frac{15}{3} = 14 - 5 = 9$

$P(4): 7 + \frac{4}{2} = 7 + 2 = 9 \quad L = P$

2)

$$x = \frac{2}{5}(2x - 7) + \frac{x}{3} + 2 \quad / \cdot 15$$

$$15x = 3 \cdot 2 \cdot (2x - 7) + 5x + 30$$

$$15x = 12x - 42 + 5x + 30 \quad / -12x$$

$$15x = 17x - 12 \quad / -17x$$

$$15x - 17x = -12$$

$$-2x = -12 \quad / : (-2)$$

$$x = 6$$

zk $L(6): 6$

$P(6): \frac{2}{5} \cdot (12 - 7) + \frac{6}{3} + 2 = \frac{2}{5} \cdot 5 + 2 + 2 = 2 + 2 + 2 = 6 \quad L = P$

3)

$$\frac{x-3}{5} + 0,6x = -2\frac{1}{5} \quad \rightarrow -2\frac{1}{5} \rightarrow -\frac{2 \cdot 5 + 1}{5}$$

$$\frac{x-3}{5} + 0,6x = -\frac{11}{5} \quad / \cdot 5$$

$$x - 3 + 3x = -11 \quad / +3$$

$$4x - 3 = -11 \quad / +3$$

$$4x = -11 + 3$$

$$4x = -8 \quad / : 4$$

$$x = -2$$

$L(-2): \frac{-2-3}{5} + 0,6 \cdot (-2) = -\frac{5}{5} - 1,2 = -1 - 1,2 = -2,2$

$P(-2): -\frac{11}{5} = -2,2 \quad L = P$

$11 : 5 = 2,2$

4)

$$\frac{5}{12} + \frac{5a-7}{3} = 2a - \frac{7}{12} \quad / \cdot 12$$

$$5 + 4 \cdot (5a - 7) = 24a - 7$$

$$5 + 20a - 28 = 24a - 7 \quad / -24a + 23$$

$$20a - 23 = 24a - 7$$

$$20a - 24a = -7 + 23$$

$$-4a = 16 \quad / : (-4)$$

$$a = -4$$

$L(-4): \frac{5}{12} + \frac{5 \cdot (-4) - 7}{3} = \frac{5}{12} - \frac{27 \cdot 4}{3 \cdot 4} = \frac{5 - 108}{12} = -\frac{103}{12}$

$P(-4): -8 - \frac{7}{12} = -\frac{96 - 7}{12} = -\frac{103}{12} \quad L = P$

5)

$$\frac{3z}{5} - \frac{1}{3} \cdot (-z) = 1\frac{4}{15} - \frac{z}{3}$$

$$\frac{3z}{5} + \frac{z}{3} = \frac{19}{15} - \frac{z}{3} \quad / \cdot 15$$

$$9z + 5z = 19 - 5z$$

$$14z = 19 - 5z \quad / +5z$$

$$14z + 5z = 19$$

$$19z = 19 \quad / : 19$$

$$z = 1$$

zk $L(1): \frac{3}{5} - \frac{1}{3} \cdot (-1) = \frac{3}{5} + \frac{1}{3} = \frac{3+5}{15} = \frac{8}{15}$

$P(1): \frac{19}{15} - \frac{1}{3} = \frac{19-5}{15} = \frac{14}{15} \quad L = P$

6)

$$A^2 + 2AB + B^2$$

$$(d+2) \cdot (d-3) + 1 = (d+1)^2$$

$$d^2 - 3d + 2d - 6 + 1 = d^2 + 2d + 1 \quad / -d^2$$

$$-d - 5 = 2d + 1 \quad / -2d + 5$$

$$-d - 2d = 1 + 5$$

$$-3d = 6 \quad / : 3$$

$$-d = 2 \quad / \cdot (-1)$$

$$d = -2$$

$L(-2): (-2+2) \cdot (-2-3) + 1 = 1$

$P(-2): (-2+1)^2 = (-1)^2 = 1 \quad L = P$

Procvičování: Rovnice se zkouškou 8

Najdi řešení rovnice a proved' zkoušku

1)

$$\frac{4z-6}{5} - \frac{3z-8}{4} = \frac{z-4}{20} + 1 \quad / \cdot 20$$

$$4 \cdot (4z-6) - 5 \cdot (3z-8) = z-4 + 20$$

$$16z - 24 - 15z + 40 = z - 4 + 20$$

$$z + 16 = z + 16 \quad / - z - 16$$

$$z - z = 16 - 16$$

$$0 = 0$$

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2)

$$\frac{1-3t}{2} + \frac{3t+11}{8} = 1 - \frac{5t-3}{4} \quad / \cdot 8$$

$$4 \cdot (1-3t) + 3t+11 = 8 - 2 \cdot (5t-3)$$

$$4 - 12t + 3t + 11 = 8 - 10t + 6$$

$$-9t + 15 = -10t + 14 \quad / + 10t - 15$$

$$-9t + 10t = 14 - 15$$

$$t = -1$$

$$2k \quad L_{(-1)}: \frac{1-3 \cdot (-1)}{2} + \frac{-3+11}{8} = \frac{1+3}{2} + \frac{8}{8} = \frac{4}{2} + 1 = 3$$

$$P_{(-1)}: 1 - \frac{5-3}{4} = 1 - \frac{-8}{4} = 1 + \frac{8}{4} = 1 + 2 = 3 \quad L=P$$

3)

$$s - \frac{1}{6}(3s+9) - 1 = \frac{1}{2}(s-5) \quad / \cdot 6$$

$$6s - (3s+9) - 6 = 3(s-5)$$

$$6s - 3s - 9 - 6 = 3s - 15$$

$$3s - 15 = 3s - 15 \quad / - 3s + 15$$

$$3s - 3s = -15 + 15$$

$$0 = 0$$

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4)

$$\frac{1}{2}(5-3x) - \frac{4}{7}(4x+11) = 2x+2 \quad / \cdot 14$$

$$7 \cdot (5-3x) - 8 \cdot (4x+11) = 28x+28$$

$$35 - 21x - 32x - 88 = 28x + 28$$

$$-53x - 53 = 28x + 28 \quad / - 28x + 53$$

$$-53x - 28x = 28 + 53$$

$$-81x = 81 \quad / : (-81)$$

$$x = -1$$

$$2k \quad L_{(-1)}: \frac{1}{2} \cdot (5-3 \cdot (-1)) - \frac{4}{7} \cdot (-4+11) = \frac{1}{2} \cdot 8 - \frac{4}{7} \cdot 7 = 4 - 4 = 0$$

$$P_{(-1)}: -2+2=0 \quad L=P$$

5)

$$\frac{7}{2} + 2 \cdot \left(5 - \frac{3+f}{4}\right) - \frac{2f+3}{2} = \frac{3f+2}{5} - 2 \cdot (f-5)$$

$$\frac{7}{2} + 10 - \frac{3+f}{2} - \frac{2f+3}{2} = \frac{3f+2}{5} - 2f + 10 \quad / \cdot 10$$

$$35 + 100 - 5 \cdot (3+f) - 5 \cdot (2f+3) = 2 \cdot (3f+2) - 20f + 100 \quad / - 100$$

$$35 - 15 - 5f - 10f - 15 = 6f + 4 - 20f$$

$$5 - 15f = -14f + 4 \quad / - 5 + 14f$$

$$-15f + 14f = 4 - 5$$

$$-f = -1 \quad / : (-1)$$

$$f = 1$$

$$L_{(1)}: \frac{7}{2} + 2 \cdot \left(5 - \frac{3+1}{4}\right) - \frac{2+3}{2} = \frac{7}{2} + 2 \cdot (5-1) - \frac{5}{2} = \frac{7}{2} + 2 \cdot 4 = 1 + 8 = 9$$

$$P_{(1)}: \frac{3+2}{5} - 2 \cdot (1-5) = \frac{5}{5} - 2 \cdot (-4) = 1 + 8 = 9 \quad L=P$$

Procvičování: Rovnice bez zkoušky 1

Najdi řešení rovnice

1)

$$\frac{6+5x}{6} - \frac{1}{3} = \frac{10}{9}x + 3 \quad / \cdot 18$$

$$18 + 15x - 6 = 20x + 54$$

$$15x - 20x = 54 - 12$$

$$-5x = 42$$

$$x = -\frac{42}{5}$$

2)

$$2 \cdot \frac{5x}{6} - \frac{1}{3} = x - \frac{1}{2} \quad / \cdot 6$$

$$2 \cdot 5x - 2 = 6x - 3$$

$$10x - 6x = -3 + 2$$

$$4x = -1$$

$$x = -\frac{1}{4}$$

3)

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

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

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

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4)

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

$$12 - 4y = 3 \cdot (2y - 1) - 8$$

$$12 - 4y = 6y - 3 - 8$$

$$-4y - 6y = -11 - 12$$

$$-10y = -23 \quad / : (-10)$$

$$y = \frac{23}{10}$$

5)

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

$$x - 3 - 2x - 2 = 2x - 16$$

$$-x - 5 = 2x - 16$$

$$-x - 2x = -16 + 5$$

$$-3x = -11$$

$$x = \frac{11}{3}$$

6)

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

$$6a - 18 + 4a - 8 - 3a + 3 = 24a + 48$$

$$7a - 23 = 24a + 48$$

$$7a - 24a = 48 + 23$$

$$-17a = 71$$

$$a = -\frac{71}{17}$$

Procvičování: Rovnice bez zkoušky 2

Najdi řešení rovnice

1)

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

$$3x - 6 = x - 2 - 15 + 2x$$

$$3x - x - 6x = -17 + 6$$

$$2x = -11$$

$$x = -\frac{11}{2}$$

2)

$$0,4 + \frac{4x}{5} - 1 = 0,2x - \frac{3}{2} \quad / \cdot 10$$

$$4 + 8x - 10 = 2x - 15$$

$$8x - 2x = -15 + 10 - 4$$

$$6x = -9 \quad / :3$$

$$2x = -3$$

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

3)

$$y - \frac{1 - 3y}{2} = \frac{7}{4} + \frac{5y}{3} \quad / \cdot 12$$

$$12y - 6 + 18y = 21 + 20y$$

$$-6 + 30y = 21 + 20y$$

$$30y - 20y = 21 + 6$$

$$10y = 27 \quad / :10$$

$$y = \frac{27}{10}$$

4)

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

$$16a - 12 + 36 - 3a = 6 \cdot (2a - 5)$$

$$13a + 24 = 12a - 30$$

$$a = -30 - 24$$

$$a = -54$$

5)

$$3t - 6 \quad 3 \cdot (t - 2) + 5,5 = 4t - \frac{2t + 1}{2} \quad / \cdot 2$$

$$6t - 12 + 11 = 8t - 2t - 1$$

$$6t - 1 = 6t - 1$$

$$0 = 0$$

NEKONEČNĚ MNOHO ŘEŠENÍ

6)

$$\frac{9 - 3y}{6} - \frac{3 - 2y}{2} = \frac{3 - y}{3} \quad / \cdot 6$$

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

$$3y = 6 - 2y$$

$$5y = 6 \quad / :5$$

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

Procvičování: Rovnice bez zkoušky 3

Najdi řešení rovnice

1)

$$\begin{aligned} 3 \cdot \left(x - \frac{x}{2} - 2\right) - 2x &= 1 + \frac{x}{2} \\ 3x - \frac{3}{2}x - 6 - 2x &= 1 + \frac{x}{2} \quad / \cdot 2 \\ 6x - 3x - 12 - 4x &= 2 + x \\ -x - 12 &= 2 + x \\ -2x &= 14 \quad / : (-2) \\ x &= -7 \end{aligned}$$

2)

$$\begin{aligned} \frac{3y-1}{3} - \frac{5y-2}{6} &= \frac{3}{4}y + 2 \quad / \cdot 12 \\ 12y - 4 - 10y + 4 &= 9y + 24 \\ 2y &= 9y + 24 \\ -7y &= 24 \quad / : (-7) \\ y &= -\frac{24}{7} \end{aligned}$$

3)

$$\begin{aligned} \frac{y-2-2y}{3} + 3 \cdot \frac{2y}{5} &= 2y - \frac{3y-1}{3} \quad / \cdot 15 \\ -10 - 5y + 18y &= 30y - 15y + 5 \\ -10 + 13y &= 15y + 5 \\ 13y - 15y &= 5 + 10 \\ -2y &= 15 \quad / : (-2) \\ y &= -\frac{15}{2} \end{aligned}$$

4)

$$\begin{aligned} \frac{2y-3}{4} - 2 \cdot \frac{y}{5} &= \frac{2-y}{2} - 1 \quad / \cdot 20 \\ 10y - 15 - 8y &= 20 - 10y - 20 \\ -15 + 2y &= -10y \\ 12y &= 15 \quad / : 3 \\ 4y &= 5 \quad / : 4 \\ y &= \frac{5}{4} \end{aligned}$$

5) $\frac{5}{6}y$

$$\begin{aligned} \frac{5}{6} \cdot (y-2) - \frac{2}{3} \cdot y &= \frac{y}{2} - \frac{5}{4} \quad / \cdot 12 \\ 10 \cdot (y-2) - 8y &= 6y - 15 \\ 10y - 20 - 8y &= 6y - 15 \\ 2y - 20 &= 6y - 15 \\ -4y &= 5 \quad / : (-4) \\ y &= -\frac{5}{4} \end{aligned}$$

6)

$$\begin{aligned} 2 \cdot (3 - 0,75x) + x &= 7 - \frac{x}{2} \quad / \cdot 2 \\ 4 \cdot (3 - 0,75x) + 2x &= 14 - x \\ 12 - 3x + 2x &= 14 - x \\ 12 - x &= 14 - x \\ 0 &= 2 \end{aligned}$$

NEMA ŘEŠENÍ,

Procvičování: Rovnice bez zkoušky 4

Najdi řešení rovnice

1)

$$\frac{3-2y}{3} = \frac{1-2y}{4} + \frac{y+3}{6} \quad / \cdot 12$$

$$12-8y = 3-6y+2y+6$$

$$12-8y = -4y+9$$

$$-8y+4y = 9-12$$

$$-4y = -3 \quad / : (-4)$$

$$y = \frac{3}{4}$$

2)

$$0,6x - \frac{1}{2} = 1,4x + 1,5 \quad / \cdot 10$$

$$6x - 5 = 14x + 15$$

$$6x - 14x = 15 + 5$$

$$-8x = 20 \quad / : 4$$

$$-2x = 5 \quad / : (-2)$$

$$x = -\frac{5}{2}$$

3)

$$0,2x + \frac{1}{2} = 2 \cdot (x + 0,25) \quad / \cdot 10$$

$$2x + 5 = 20(x + 0,25)$$

$$2x + 5 = 20x + 5$$

$$-18x = 0 \quad / : (-18)$$

$$x = 0$$

4)

$$x \cdot (x+2) + 0,6 = x \cdot x + \frac{1}{5} \quad / \cdot 5$$

$$x^2 + 2x + 0,6 = x^2 + \frac{1}{5}$$

$$2x = \frac{1}{5} - 0,6$$

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

$$2x = -\frac{2}{5} \quad / : 2$$

$$x = -\frac{1}{5}$$

$$0,6 = \frac{6}{10} = \frac{3}{5}$$

$$5x^2 + 10x + 3 = 5x^2 + 1$$

$$10x = 1 - 3$$

$$10x = -2 \quad / : 2$$

$$5x = -1 \quad / : 5$$

$$x = -\frac{1}{5}$$

5)

$$\frac{12-3 \cdot (6x-1)}{2} + \frac{5x}{4} - 2 = \frac{2 \cdot (x-2)}{8} \quad / \cdot 4$$

$$2 \cdot (12 - 3 \cdot (6x-1)) + 5x - 8 = x - 2$$

$$-36x + 30 + 5x - 8 = x - 2$$

$$-31x + 22 = x - 2$$

$$-31x - x = -2 - 22$$

$$-32x = -24 \quad / : 8$$

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

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

6)

$$5 \cdot (11b-7) - 15 \cdot (3b-2) = \frac{4-b}{2} + b \cdot \frac{30}{4} - 5 \quad / \cdot 2$$

$$10 \cdot (11b-7) - 30 \cdot (3b-2) = 4-b + 15b - 10$$

$$110b - 70 - 90b + 60 = 4 - b + 15b - 10$$

$$20b - 10 = 14b - 6$$

$$20b - 14b = -6 + 10$$

$$6b = 4 \quad / : 2$$

$$3b = 2 \quad / : 3$$

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