

M₉Soustava dvou rovnic o dvou neznámých

od 14.1.

monna

$$\begin{array}{r} x + y = 3 \\ x - y = 1 \\ \hline \end{array}$$

... snadno uvidíme,

že $x = 2$ a $y = 1$

$2 + 1 = 3$

$2 - 1 = 1$

a, metoda dosazovací

$$\begin{array}{r} x + y = 3 \\ x - y = 1 \\ \hline \end{array} \Rightarrow x = 3 - y$$

$x = 3 - 1$

$\boxed{x = 2}$

$3 - y - y = 1$

$-y - y = 1 - 3$

$-2y = -2$

$y = -2 : (-2)$

$\boxed{y = 1}$

zk:

$L_1 = 2 + 1 = 3 \quad P_1 = 3 \quad L_1 = P_1$

$L_2 = 2 - 1 = 1 \quad P_2 = 1 \quad L_2 = P_2$

b) metoda sčítací

$$\begin{array}{r} x + y = 3 \\ x - y = 1 \\ \hline \end{array}$$

$2x = 4$

$x = 4 : 2$

$\boxed{x = 2}$

$\rightarrow 2 + y = 3$

$y = 3 - 2$

$\boxed{y = 1}$

c) grafická porovnání

havičmí

8t. 2l. 8b.

66/1a)

$$\begin{array}{r} x + y = 1 \\ x - y = 5 \\ \hline 2x = 6 \\ x = 6 : 2 \\ \boxed{x = 3} \end{array}$$

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

zh:

$$\begin{array}{l} L_1 = 3 + (-2) = 3 - 2 = \textcircled{1} \\ P_1 = \textcircled{1} \\ L_1 = P_1 \\ L_2 = 3 - (-2) = 3 + 2 = \textcircled{5} \\ P_2 = \textcircled{5} \\ L_2 = P_2 \end{array}$$

66/1b)

$$\begin{array}{r} x + y = 3 \\ 3x - y = 5 \\ \hline 4x = 8 \\ x = 8 : 4 \\ \boxed{x = 2} \end{array}$$

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

zh:

$$\begin{array}{l} L_1 = 2 + 1 = \textcircled{3} \\ P_1 = \textcircled{3} \\ L_1 = P_1 \\ L_2 = 3 \cdot 2 - 1 = \textcircled{5} \\ P_2 = \textcircled{5} \\ L_2 = P_2 \end{array}$$

67/3 a)

$$\begin{array}{r} 3x - 6y = 0 \\ 5x + 2y = 18 \quad | \cdot 3 \\ \hline 3x - 6y = 0 \\ 15x + 6y = 54 \\ \hline 18x = 54 \\ x = 54 : 18 \\ \boxed{x = 3} \end{array}$$

$$\begin{array}{l} 3 \cdot 3 - 6y = 0 \\ -6y = -9 \\ y = -9 : (-6) \\ \boxed{y = 1,5} \end{array} \quad \frac{9}{6} = \frac{3}{2} = 1,5$$

zh:

$$\begin{array}{l} L_1 = 3 \cdot 3 - 6 \cdot 1,5 = 9 - 9 = \textcircled{0} \\ P_1 = \textcircled{0} \\ L_1 = P_1 \\ L_2 = 5 \cdot 3 + 2 \cdot 1,5 = 15 + 3 = \textcircled{18} \\ P_2 = \textcircled{18} \\ L_2 = P_2 \end{array}$$

67/3 b)

$$\begin{array}{rcl} 3x + 2y & = & 0 \quad | \cdot 5 \\ 2x - 5y & = & -19 \quad | \cdot 2 \\ \hline \end{array}$$

$$\begin{array}{rcl} 15x + 10y & = & 0 \\ 4x - 10y & = & -38 \\ \hline 19x & = & -38 \\ x & = & -38 : 19 \\ \boxed{x = -2} \end{array}$$

$$\begin{aligned} \Rightarrow 15 \cdot (-2) + 10y &= 0 \\ -30 + 10y &= 0 \\ 10y &= 30 \\ y &= 30 : 10 \\ \boxed{y = 3} \end{aligned}$$

zk:

$$\begin{aligned} L_1 &= 15 \cdot (-2) + 10 \cdot 3 = -30 + 30 = 0 \\ P_1 &= 0 \\ L_1 &= P_1 \\ L_2 &= 4 \cdot (-2) - 10 \cdot 3 = -8 - 30 = -38 \\ P_2 &= -38 \\ L_2 &= P_2 \end{aligned}$$

... sa rovná úloha jina

$$\begin{array}{rcl} 15x + 10y & = & 0 \quad | \cdot 4 \\ 4x - 10y & = & -38 \quad | \cdot (-15) \\ \hline 60x + 40y & = & 0 \\ -60x + 150y & = & 570 \\ \hline 190y & = & 570 \\ y & = & 570 : 190 \\ \boxed{y = 3} \end{array}$$

$$\begin{aligned} \rightarrow 15x + 10 \cdot 3 &= 0 \\ 15x + 30 &= 0 \\ 15x &= -30 \\ x &= -30 : 15 \\ \boxed{x = -2} \end{aligned}$$

... všetky cesty vedú do Rima, ale
"toto je najvhodnejšie..."

67/3 c)

$$\begin{array}{rcl} 3x + 4y & = & -10 \\ 5x - 2y & = & -8 \quad | \cdot 2 \\ \hline 3x + 4y & = & -10 \\ 10x - 4y & = & -16 \\ \hline 13x & = & -26 \\ x & = & -26 : 13 \\ \boxed{x = -2} \end{array}$$

$$\begin{aligned} \Rightarrow 3 \cdot (-2) + 4y &= -10 \\ -6 + 4y &= -10 \\ 4y &= -10 + 6 \\ 4y &= -4 \\ y &= -4 : 4 \\ \boxed{y = -1} \end{aligned}$$

$$\begin{aligned} \text{zk: } L_1 &= 3 \cdot (-2) + 4 \cdot (-1) = -6 - 4 = -10 \\ P_1 &= -10 \\ L_1 &= P_1 \\ L_2 &= 5 \cdot (-2) - 2 \cdot (-1) = -10 + 2 = -8 \\ P_2 &= -8 \\ L_2 &= P_2 \end{aligned}$$

67/5

a) $4x - 3y = 13 \quad | \cdot 2$

$$14x + 6y = 5$$

$$14x - 6y = 26$$

$$14x + 6y = 5$$

$$31x = 31$$

$$x = 31 : 31$$

$$\boxed{x = 1}$$

$$\Rightarrow 4 \cdot 1 - 3y = 13$$

$$4 - 3y = 13$$

$$-3y = 13 - 4$$

$$-3y = 9$$

$$y = 9 : (-3)$$

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

$$2b: L_1 = 4 \cdot 1 - 3 \cdot (-3) = 4 + 9 = 13$$

$$P_1 = 13$$

$$L_1 = P_1$$

$$L_2 = 14 \cdot 1 + 6 \cdot (-3) = 14 - 18 = -4$$

$$P_2 = -4$$

$$L_2 = P_2$$

67/5

b) $2x - 3y = -18 \quad | \cdot 5$

$$6x + 5y = 2 \quad | \cdot 3$$

$$10x - 15y = -90$$

$$18x + 15y = 6$$

$$28x = -84$$

$$x = -84 : 28$$

$$\boxed{x = -3}$$

$$\Rightarrow 2 \cdot (-3) - 3y = -18$$

$$-6 - 3y = -18$$

$$-3y = -18 + 6$$

$$-3y = -12$$

$$y = -12 : (-3)$$

$$\boxed{y = 4}$$

$$2b: L_1 = 2 \cdot (-3) - 3 \cdot 4 = -6 - 12 = -18$$

$$P_1 = -18$$

$$L_1 = P_1$$

$$L_2 = 6 \cdot (-3) + 5 \cdot 4 = -18 + 20 = 2$$

$$P_2 = 2$$

$$L = P$$