

1. gimnazje

DOMAĆA ZADACA - Sustavi linearnih jednačina

$$\begin{aligned} 1. \quad & \begin{cases} x + \frac{y}{2} = -1/2 \\ x - \frac{y}{5} = 1.1 / \cdot 10 \end{cases} & \begin{cases} 2x + y = -2 \\ 2x - 3 = -2 \\ 2x = -2 + 3 \\ 2x = 1 / : 2 \\ x = \frac{1}{2} \end{cases} \\ & \begin{array}{r} 2x + y = -2 \cdot (-5) \\ 10x - 2y = 11 \end{array} & \\ & \begin{array}{r} -10x - 5y = 10 \\ 10x - 2y = 11 \end{array} + & \left(\frac{1}{2}, -3 \right) \\ & -7y = 21 / : (-7) & \\ & y = -3 & \end{aligned}$$

$$\begin{aligned} 2. \quad & \begin{cases} 0.8y - 2(2 + 0.1x) = 3 \\ 0.4y - 2(3 + y) = x + 0.4 \end{cases} & \begin{cases} 4y - x = 35 \\ 4y - \frac{15}{2} = 35 \end{cases} \\ & \begin{array}{r} \frac{4}{5}y - 4 - \frac{1}{5}x = 3 / \cdot 5 \\ \frac{2}{5}y - 18 + 2y = x / \cdot 5 \end{array} & \begin{cases} 4y = 35 + \frac{15}{2} \\ 4y = \frac{85}{2} / : 4 \end{cases} \\ & \begin{array}{r} 4y - 20 - x = 15 \\ 2y - 30 + 10y + 5x \end{array} & \begin{cases} y = \frac{85}{8} \\ \left(\frac{15}{2}, \frac{85}{8} \right) \end{cases} \\ & \begin{array}{r} -12y + 3x = -105 \\ 12y - 5x = 90 \end{array} + & \\ & -2x = -15 / : (-2) & \\ & x = \frac{15}{2} & \end{aligned}$$

$$\begin{aligned} 3. \quad & \begin{cases} \frac{4}{x} + \frac{5}{y} = 7 \\ \frac{8}{x} - \frac{5}{y} = 5 \end{cases} & \rightarrow \frac{1}{x} = a, \frac{1}{y} = b \\ & \begin{array}{r} 4a + 5b = 7 \\ 8a - 5b = 5 \end{array} + & \begin{cases} 4 \cdot 1 + 5b = 7 \\ 4 + 5b = 7 \\ 5b = 7 - 4 \\ 5b = 3 / : 5 \\ b = \frac{3}{5} \end{cases} & \left(1, \frac{5}{3} \right) \\ & \begin{array}{r} 12a = 12 / : 12 \\ a = 1 \end{array} & \begin{cases} \frac{1}{y} = \frac{3}{5} \\ 3y = 5 / : 3 \\ y = \frac{5}{3} \end{cases} \end{aligned}$$

$$4. \begin{cases} \frac{3}{x-y} + \frac{5}{x+y} = 2 \\ \frac{9}{x-y} - \frac{15}{x+y} = 0 \end{cases} \longrightarrow \frac{1}{x-y} = a, \frac{1}{x+y} = b$$

$$3a + 5b = 2 \quad | \cdot (-3)$$

$$3a - 15b = 0$$

$$-9a - 15b = -6$$

$$3b - 15b = 0 \quad | +$$

$$-30b = -6 \quad | : (-30)$$

$$b = \frac{6}{30} = \frac{1}{5}$$

$$3a - 15b = 0$$

$$3a - 15 \cdot \frac{1}{5} = 0$$

$$3a - 3 = 0$$

$$3a = 3 \quad | : 3$$

$$a = \frac{3}{3} = 1$$

$$\begin{cases} x-y=3 \\ x+y=5 \end{cases} \quad | + \quad \begin{cases} x+y=5 \\ 4+y=5 \\ y=1 \end{cases}$$

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

$$x = 4$$

$$(4, 1)$$

$$5. \begin{cases} x+y+z=6 \\ x-y+2z=5 \\ 2x+3y+4z=8 \end{cases} \longrightarrow x=6-y-z \longrightarrow x=6-2-3$$

$$x=1$$

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

$$2(6-y-z)-3y+4z=8$$

$$-2y+z=-1 \quad | \cdot (-2)$$

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

$$\begin{cases} 4y-2z=2 \\ -5y+2z=-4 \end{cases} \quad | +$$

$$-y = -2 \quad | : (-1)$$

$$y = 2$$

$$(1, 2, 3)$$

$$-2y+z=-1$$

$$-2 \cdot 2 + z = -1$$

$$-4 + z = -1$$

$$z = -1 + 4$$

$$z = 3$$