

18.01.22

2.5.21

$$k) \begin{cases} x - y - z = 6 \\ x - 2y - 3z = 10 \\ 5x + 6y + z = 2 \end{cases}$$

$$\begin{array}{c|c|c} X & X & \\ \hline \textcircled{1} & \textcircled{2} & \\ \hline \cdot 1 & \cdot 5 & \\ \hline \cdot (-1) & \cdot (-1) & \\ \hline y & z & \\ \hline \textcircled{3} & \textcircled{4} & \\ \hline \cdot 11 & \cdot 3 & \\ \hline \cdot 1 & \cdot 1 & \end{array}$$

$$\Leftrightarrow \begin{cases} \textcircled{1} & y + 2z = -4 \\ \textcircled{2} & -11y - 6z = 28 \\ & x - y - z = 6 \end{cases}$$

$$\Leftrightarrow \begin{cases} \textcircled{3} & 16z = -16 \\ \textcircled{4} & -8y = 16 \\ & x - y - z = 6 \end{cases} \quad \begin{array}{l} \div 16 \\ \div (-8) \end{array}$$

$$\Leftrightarrow \begin{cases} z = -1 \\ y = -2 \\ x + 2 + 1 = 6 \end{cases}$$

m) r)

$$\begin{array}{l} \textcircled{1} \quad x - y - z = 6 \\ \quad -x + 2y + 3z = -10 \\ \hline \end{array}$$

$$y + 2z = -4$$

$$\begin{array}{l} \textcircled{2} \quad 5x - 5y - 5z = 30 \\ \quad -5x - 6y - z = -2 \\ \hline \end{array}$$

$$-11y - 6z = 28$$

$$\begin{array}{l} \textcircled{3} \quad 11y + 22z = -44 \\ \quad -11y - 6z = 28 \\ \hline \end{array}$$

$$16z = -16$$

$$\begin{cases} x = 3 \\ y = -2 \\ z = -1 \end{cases}$$

$$S = \{ (3; -2; -1) \}$$

$$m) \begin{cases} 3x - y + z = 29 \\ x + 3y + 30z = 6 \\ x - y + z = 17 \end{cases} \quad \begin{array}{l} \times \textcircled{1} \\ \cdot 1 \\ \cdot 1 \\ \cdot (-1) \end{array} \quad \begin{array}{l} \times \textcircled{2} \\ \cdot 1 \\ \cdot (-3) \end{array}$$

$$\Leftrightarrow \begin{cases} \textcircled{1} & 4y + 29z = -11 \\ \textcircled{2} & -10y - 89z = 11 \\ & x - y + z = 17 \end{cases} \quad \begin{array}{l} y \textcircled{3} \\ \cdot 5 \\ \cdot 2 \end{array} \quad \begin{array}{l} z \textcircled{4} \\ \cdot 89 \\ \cdot 29 \end{array}$$

$$\Leftrightarrow \begin{cases} \textcircled{3} & -33z = -33 \\ \textcircled{4} & 66y = -660 \\ & x - y + z = 17 \end{cases} \quad \begin{array}{l} \div (-33) \\ \div 66 \end{array}$$

$$\Leftrightarrow \begin{cases} z = 1 \\ y = -10 \\ x + 10 + 1 = 17 \end{cases}$$

$$\Leftrightarrow \begin{cases} z = 1 \\ y = -10 \\ x = 6 \end{cases}$$

r)

o)

n) fraction

q)

$$\textcircled{1} \begin{array}{r} x + 3y + 30z = 6 \\ -x + y - z = -17 \\ \hline \end{array}$$

$$4y + 29z = -11$$

$$\textcircled{2} \begin{array}{r} 3x - y + z = 29 \\ -3x - 9y - 90z = -18 \\ \hline \end{array}$$

$$-10y - 89z = 11$$

$$\textcircled{3} \begin{array}{r} 20y + 145z = -55 \\ -20y - 178z = 22 \\ \hline \end{array}$$

$$-33z = -33$$

$$\textcircled{4} \begin{array}{r} 356y + 2581z = -979 \\ -290y - 2581z = 319 \\ \hline \end{array}$$

$$66y$$

$$= -660$$

$$S = \{ (6, -10, 1) \}$$

$$\text{r)} \begin{cases} x - y + z = 0 \\ -x + y + z = 10 \\ x + y - z = 2 \end{cases} \quad \left| \begin{array}{c|c} x & y \\ \hline \cdot 1 & \cdot 1 \\ \cdot 1 & \cdot 1 \end{array} \right|$$

$$\textcircled{1} \begin{cases} 2y = 12 \\ -x + y + z = 10 \end{cases}$$

$$\textcircled{2} \begin{cases} 2z = 10 \end{cases}$$

$$S = \{(1; 6; 5)\}$$

$$\textcircled{3} \begin{cases} y = 6 \\ z = 5 \\ -x + 6 + 5 = 10 \end{cases}$$

$$-x + 11 = 10$$

$$x = 1$$

$$o) \begin{cases} 2x + y - z = 1 \\ x + 2y + z = 8 \\ 3x - y + 2z = 7 \end{cases} \left| \begin{array}{l} \cdot (-2) \\ \cdot 1 \\ \cdot 2 \end{array} \right| \begin{array}{l} 1 \\ 1 \\ 2 \end{array}$$

$$\begin{cases} -x + z = 2 \\ 7x + 5z = 22 \\ 2x + y - z = 1 \end{cases} \left| \begin{array}{l} \cdot 7 \\ \cdot 1 \\ ! \end{array} \right| \begin{array}{l} (-5) \\ 1 \\ \end{array}$$

$$\begin{cases} z = 3 \\ x = 1 \\ 2x + y - z = 1 \end{cases}$$

$$2 + y - 3 = 1$$

$$y = 2$$

$$S = \{(1; 2; 3)\}$$

$$\begin{aligned} & -4x - 2y + 2z = -2 \quad (7) \\ & \textcircled{+} \quad x + 2y + z = 8 \\ & \hline & -3x + 3z = 6 \Rightarrow -x + z = 2 \end{aligned}$$

$$\begin{aligned} & x + 2y + z = 8 \quad (2) \\ & 6x - 2y + 4z = 14 \\ & \hline & 7x + 5z = 22 \end{aligned}$$

$$\begin{aligned} & -7x + 7z = 14 \quad (3) \\ & + 7x + 5z = 22 \\ & \hline & 12z = 36 \quad | : 12 \\ & \quad z = 3 \end{aligned}$$

$$\begin{aligned} & 5x - 5z = -10 \quad (4) \\ & + 7x + 5z = 22 \\ & \hline & 12x = 12 \\ & \quad x = 1 \end{aligned}$$

$$q) \begin{cases} 2x - y + 3z = 4 \\ 3x + 4y - z = -5 \\ x + 5y - 4z = -9 \end{cases} \begin{array}{c|c} \overset{(1)}{x} & \overset{(2)}{x} \\ \cdot 1 & \\ \cdot (-2) & (-3) \end{array}$$

$$\Leftrightarrow \begin{cases} \textcircled{1} -y + z = 2 \\ \textcircled{3} x + 5y - 4z = -9 \end{cases}$$

il y a plus d'inconnues que d'équations

3 inconnues
2 équations $\Rightarrow$ 1 degré de liberté

$$\left\{ \begin{array}{l} \textcircled{1} \begin{array}{l} 2x - y + 3z = 4 \\ -2x - 10y + 8z = 18 \\ \hline -11y + 11z = 22 \quad | : 11 \\ \textcircled{1} -y + z = 2 \end{array} \\ \textcircled{2} \begin{array}{l} 3x + 4y - z = -5 \\ -3x - 15y + 12z = +27 \\ \hline -11y + 11z = 22 \\ \textcircled{2} = \textcircled{1} -y + z = 2 \end{array} \end{array} \right.$$

$$\Leftrightarrow \begin{cases} \textcircled{1} z = t \\ \textcircled{3} y = z - 2 \\ x = -5y + 4z - 9 \end{cases} \quad z \text{ prend une valeur quelconque}$$

$$\Leftrightarrow \begin{cases} z = t \\ y = t - 2 \\ x = -5(t - 2) + 4t - 9 \end{cases}$$

$$\Leftrightarrow \begin{cases} z = t \\ y = t - 2 \\ x = -t + 1 \end{cases}$$

$$S = \left\{ \begin{pmatrix} -t + 1 \\ t - 2 \\ t \end{pmatrix} \mid t \in \mathbb{R} \right\}$$

2.5.22 Résoudre les systèmes suivants :

$$a) \begin{cases} 2xy - 3y = 3 \\ y^2 - 4xy = -15 \end{cases}$$

$$\Leftrightarrow \begin{cases} \textcircled{1} & 2xy = 3y + 3 \\ \textcircled{2} & y^2 - 2(3y + 3) = -15 \end{cases}$$

$$\begin{aligned} \text{Résolvons } \textcircled{2} : \quad & y^2 - 6y - 6 + 15 = 0 \\ & y^2 - 6y + 9 = 0 \\ & (y - 3)^2 = 0 \\ & \underline{y = 3} \end{aligned}$$

$$\text{Substituons } y = 3 \text{ dans } \textcircled{1} : \quad 2x \cdot 3 - 9 = 3$$

$$6x = 12$$

$$\underline{x = 2}$$

$$S = \{ (2; 3) \}$$