Exercice 7 *Résoudre dans* $\mathbb{R}^2$ *avec l'une des trois méthodes*

1 $$\begin{cases} 2x + 4y = 42 \\ -5x + 7y = 31 \end{cases}$$

2 $$\begin{cases} 3x - 8y = 36 \\ 4x - 5y = -14 \end{cases}$$

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

4 $$\begin{cases} 5x - \dfrac{y}{4} = 33 \\ -10x + \dfrac{y}{2} = -68 \end{cases}$$

~~5~~ X $$\begin{cases} mx + 5y = 10 \\ 3x - 2y = -2 \end{cases}$$

6 $$\begin{cases} x + 2y = 17 \\ -2x + 3y = 1 \end{cases}$$

7 $$\begin{cases} 2x = 3y \\ x + y = \dfrac{5}{12} \end{cases}$$

8 $$\begin{cases} x^2 + 2y^2 = 22 \\ 2x^2 - y^2 = -1 \end{cases}$$

9 $$\begin{cases} \dfrac{x}{3} - \dfrac{y}{2} = -2 \\ -x + \dfrac{3y}{2} = 6 \end{cases}$$

10 $$\begin{cases} \dfrac{x}{2} = 4y \\ 3 = 2y - x \end{cases}$$

11 $$\begin{cases} 11x + 18y = 1 \\ 22x + 36y = 3 \end{cases}$$

12 $$\begin{cases} 2x = -\dfrac{1}{3} \\ -7y = 1 + x \end{cases}$$

9 $\begin{cases} \frac{x}{3} - \frac{y}{2} = -2 \\ -x + \frac{3y}{2} = 6 \end{cases}$ et $(x;y) \in \mathbb{R} \times \mathbb{R}$

$\Leftrightarrow \begin{cases} 2x - 3y = -12 \\ -2x + 3y = 12 \end{cases}$ $\Leftrightarrow \begin{cases} 2x - 3y = -12 \\ 2x - 3y = -12 \end{cases}$ ("même" équation)

$\Leftrightarrow 2x - 3y = -12$ on a qu'une équation pour 2 inconnues le système est dit INDÉTERMINÉ

car si $x = 0$, alors $y = 4$
$x = 1$, alors $y = \frac{14}{3}$
$x = -2$, alors $y = \frac{8}{3}$
etc...

ou si $y = 0$, alors $x = -6$
$y = 3$, alors $x = \frac{-3}{2}$
etc...

il y a une infinité de "couple-solution"

(1) $\Leftrightarrow (x;y) \in \left\{ \left(k; \frac{2k+12}{3}\right) \mid k \in \mathbb{R} \right\}$ (car si l'on pose $x = k$, k un réel qcq, alors $y = \frac{2x+12}{3}$ et $x = k$ $= \frac{2k+12}{3}$)

(ou (2) $\Leftrightarrow (x;y) \in \left\{ \left(\frac{3k-12}{2}; k\right) \mid k \in \mathbb{R} \right\}$)

répondre à choix (1) ou (2)

10 $\begin{cases} \frac{x}{2} = 4y \\ 3 = 2y - x \end{cases}$ et $(x;y) \in \mathbb{R} \times \mathbb{R}$ $\Leftrightarrow \begin{cases} x - 8y = 0 & \vert \cdot 1 \\ x - 2y = -3 & \vert \; 1 \end{cases}$

$\Leftrightarrow \begin{cases} 6y = -3 \text{ et } y = -\frac{1}{2} \\ x = -4 \end{cases} \Leftrightarrow (x;y) \in \left\{\left(-4;-\frac{1}{2}\right)\right\}$

13 $\begin{cases} \dfrac{5(x+y)}{3} = 15 \\ x - 2y = -3 \end{cases}$

14 $\begin{cases} 2x + y + 7 = -7 - 3y \\ 4x + 4y + 4 = x - 7 \end{cases}$

15 $\begin{cases} \dfrac{x+y}{2} = \dfrac{x-y}{3} \\ x + 4y = -\dfrac{1}{2} \end{cases}$

16 $\begin{cases} \dfrac{1}{x} + \dfrac{1}{y} = \dfrac{7}{12} \\ \dfrac{1}{x} - \dfrac{1}{y} = -\dfrac{1}{12} \end{cases}$

17 $\begin{cases} \dfrac{1}{x+1} + \dfrac{1}{y-2} = \dfrac{7}{12} \\ \dfrac{1}{x+1} - \dfrac{1}{y-2} = -\dfrac{1}{2} \end{cases}$

18 $\begin{cases} x + \dfrac{8}{y-1} = -3 \\ -2x + \dfrac{12}{y-1} = -3 \end{cases}$

19 $\begin{cases} \dfrac{7}{x} + \dfrac{4}{y} = \dfrac{1}{2} \\ \dfrac{3}{x} - \dfrac{5}{y} = \dfrac{3}{14} \end{cases}$

20 $\begin{cases} \dfrac{x+y}{xy} = \dfrac{3}{4} \\ \dfrac{x-y}{xy} = \dfrac{1}{4} \end{cases}$

21 $\begin{cases} 2(x+2y) = 0 \\ -3(-y+3x) = 0 \end{cases}$

22 $\begin{cases} \dfrac{x}{3} = 2y - 1 \\ 3 = 2y - x \end{cases}$

23 $\begin{cases} \dfrac{x}{3} - 5y + 8 = \dfrac{x}{2} - 3 \\ \dfrac{y}{2} - \dfrac{x}{3} + 4 = y + 1 \end{cases}$

24 $\begin{cases} 2y + 3x - \dfrac{43}{12} = 0 \\ -5x + 3y = -\dfrac{7}{4} \end{cases}$

25 $\begin{cases} 2x + (m-1)y = 1 \\ 3x + y = 0 \end{cases}$

26 $\begin{cases} mx + y = 2 \\ 2x - y = 1 \end{cases}$

27 $\begin{cases} 5x - 2y = m \\ 2x + 3y = 17 \end{cases}$

28 $\begin{cases} (m+2)x + y = 1 \\ 3x + 2y = 13 \end{cases}$

29 $\begin{cases} x + my = 2 \\ mx + 3y = 3 \end{cases}$

30 $\begin{cases} x + 4y = m+3 \\ 7x - y = 1 \end{cases}$

31 $\begin{cases} x + y = 3 \\ mx - 2y = 5 \end{cases}$

15 $\begin{cases} \dfrac{x+y}{2} = \dfrac{x-y}{3} \\ x + 4y = -\dfrac{1}{2} \end{cases}$ et $(x;y) \in \mathbb{R} \times \mathbb{R}$ $\Leftrightarrow \begin{cases} 3x + 3y = 2x - 2y \\ 2x + 8y = -1 \end{cases}$

$$\Leftrightarrow \begin{cases} x + 5y = 0 \\ 2x + 8y = -1 \end{cases} \begin{array}{|l} -2 \\ 1 \end{array}$$

$$\Leftrightarrow \begin{cases} -2x - 10y = 0 & (1) \\ 2x + 8y = -1 & (2) \end{cases} \Leftrightarrow \begin{cases} 0 \cdot x - 2y = -1 & (1)+(2) \\ \quad \text{et } y = \frac{1}{2} \\ 2x + 8\left(\frac{1}{2}\right) = -1 \end{cases}$$

$$\Leftrightarrow \begin{cases} y = \frac{1}{2} \\ x = \frac{-5}{2} \end{cases} \Leftrightarrow (x;y) \in \left\{\left(-\frac{5}{2}; \frac{1}{2}\right)\right\}$$