

REPÈRE DE COORDONNÉES

y

BASE: $(\vec{e}_1; \vec{e}_2)$

$(\vec{a}; \vec{b})$

$$\vec{a} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$\vec{a} = \vec{e}_1 + \vec{e}_2$$

$$\vec{b} = \vec{e}_1 - \vec{e}_2$$

combinaison
linéaire

$$\vec{d} = \begin{pmatrix} 1 \\ -3 \end{pmatrix}$$

1

0

1

$\vec{u}$

$2,5\vec{a}$

$1,5\vec{b}$

$$\vec{c} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$$

Dessiner $\vec{u} = 5\vec{e}_1 - 2\vec{e}_2$

$$\vec{c} = 2,5\vec{a} + 1,5\vec{b} \quad \text{exact}$$

composantes de $\vec{c}$ rel. $(\vec{e}_1; \vec{e}_2)$

$$\vec{c} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$$

$$\vec{a} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$\vec{b} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$\begin{pmatrix} 4 \\ 1 \end{pmatrix} = x \begin{pmatrix} 1 \\ 1 \end{pmatrix} + y \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$\begin{pmatrix} 4 \\ 1 \end{pmatrix} = \begin{pmatrix} x \\ x \end{pmatrix} + \begin{pmatrix} y \\ -y \end{pmatrix}$$

$$\begin{cases} 4 = x + y \\ 1 = x - y \end{cases}$$

$$\begin{aligned} 2x &= 5 \\ x &= 2,5 \end{aligned}$$

$$3 = 2y$$

$$y = 1,5$$

$\vec{z}$ comme combinaison lin. de $\vec{c}$ et $\vec{d}$

$$\begin{pmatrix} 1 \\ 1 \end{pmatrix} = s \begin{pmatrix} 4 \\ 1 \end{pmatrix} + t \begin{pmatrix} 1 \\ -3 \end{pmatrix} = \begin{pmatrix} 4s \\ s \end{pmatrix} + \begin{pmatrix} t \\ -3t \end{pmatrix}$$

$$\begin{cases} 1 = 4s + t \\ 1 = s - 3t \end{cases}$$

$$\begin{cases} 1 = 4s + t \\ 4 = 4s - 12t \end{cases}$$

$$-3 = 13t$$

$$t = -\frac{3}{13}$$

$$3 = 12s + 3t$$

$$1 = s - 3t$$

$$4 = 13s$$

$$s = \frac{4}{13}$$

$$\vec{z} = \frac{4}{13} \cdot \vec{c} - \frac{3}{13} \vec{d}$$

Résoudre un système 2x2

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

$$x = 5 - 2y$$

$$3(5 - 2y) - y = 8$$

$$15 - 6y - y = 8 \quad / \quad 7 = 7y \quad y = 1$$

$$x + 2 = 5$$

$$x = 3$$

$$3 + 2 \cdot 1 = 5 \quad \checkmark$$

$$3 \cdot 3 - 1 = 8 \quad \checkmark$$

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

$$L_1 \leftarrow 3L_1$$

$$\begin{cases} 3x + 6y = 15 \\ 3x - y = 8 \end{cases}$$

$$L_2 \leftarrow L_2 - L_1$$

$$\begin{cases} 3x + 6y = 15 \\ 7y = 7 \end{cases}$$

$$3x + 6 = 15 \mid 3x = 9 \mid x = 3$$

$$y = 1$$