Sistemi lineari

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

Prova

$$\begin{cases} \frac{4}{3} - \frac{1}{3} = 1 \\ \frac{8}{3} + \frac{1}{3} = 3 \end{cases}$$

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

$$\begin{cases} x = y + 1 \quad (*) \\ y + 1 = \dfrac{3 - y}{2} \end{cases}$$

$$\begin{cases} (*) \\ 2y + 2 = 3 - y \end{cases} \quad \begin{cases} (*) \\ 3y = 1 \end{cases} \quad \begin{cases} (*) \\ y = \dfrac{1}{3} \end{cases}$$
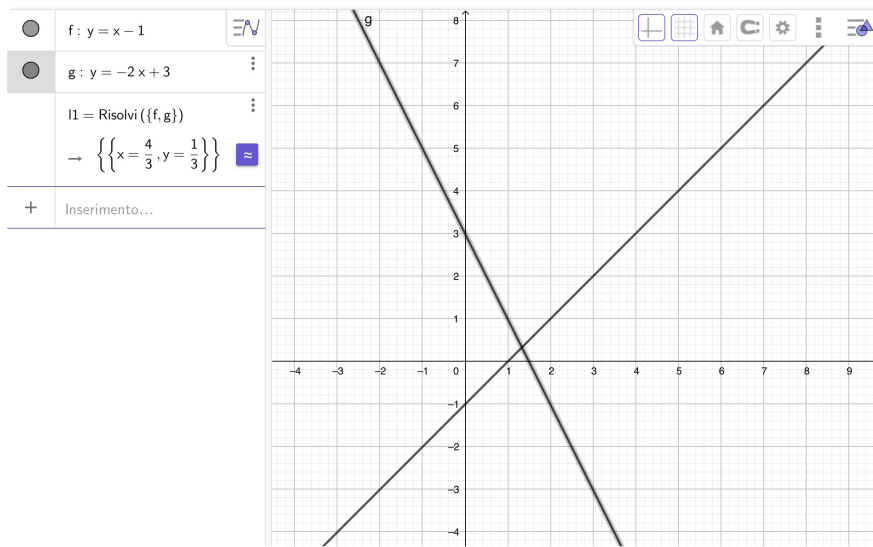
$$\begin{cases} x = \dfrac{1}{3} + 1 \\ y = \dfrac{1}{3} \end{cases} \quad \begin{cases} x = \dfrac{4}{3} \\ y = \dfrac{1}{3} \end{cases} \quad \left(\dfrac{4}{3} , \dfrac{1}{3} \right)$$

Metodo grafico

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

f : y = x − 1

g : y = −2 x + 3

l1 = Risolvi ({f, g})

→ $\left\{ \left\{ x = \dfrac{4}{3}, y = \dfrac{1}{3} \right\} \right\}$

Inserimento…

Metodo di sostituzione

$$\begin{cases} 2x + 3y = 5 \\ x - 2y = -1 \end{cases} \qquad \begin{cases} x = 2y - 1 \quad (*) \\ 2(2y-1) + 3y = 5 \end{cases}$$

$$\begin{cases} (*) \\ 4y - 2 + 3y = 5 \end{cases} \qquad \begin{cases} (*) \\ y = 1 \end{cases}$$

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

Matrici

$$\begin{pmatrix} 1 & 2 & 3 \\ -2 & -1 & 0 \\ 4 & 7 & 1 \end{pmatrix}$$

$\leftarrow 1^e r$

$\leftarrow 2^e r$

$\leftarrow 3^a r$

$\uparrow \quad \uparrow \quad \uparrow$

$1^e c \quad 2^a c \quad 3^a c$

$a_{21} = -2$

$3 = a_{13}$

$$\begin{pmatrix} 1 & 2 \\ 3 & 5 \end{pmatrix}$$

$$\begin{vmatrix} 1 & -2 \\ 3 & 5 \end{vmatrix} = 1 \cdot 5 - 3(-2) = 5 + 6 = 11$$

Metodo di Cramer

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

$$D = \begin{vmatrix} 1 & -1 \\ 2 & 1 \end{vmatrix} = 1 + 2 = 3$$

$$D_x = \begin{vmatrix} 1 & -1 \\ 3 & 1 \end{vmatrix} = 1 + 3 = 4$$

$$D_y = \begin{vmatrix} 1 & 1 \\ 2 & 3 \end{vmatrix} = 3 - 2 = 1$$

$$\begin{cases} x = \dfrac{D_x}{D} = \dfrac{4}{3} \\ y = \dfrac{D_y}{D} = \dfrac{1}{3} \end{cases}$$