30/9/2020

268 $\begin{cases} (x+y)^2 = (x-y)^2 - y + 4x(y-1) \\ 2x + y = 3 \end{cases}$ $\left[\left(-\frac{3}{2}, 6\right)\right]$

$$\begin{cases} x^2 + y^2 + 2xy = x^2 + y^2 - 2xy - y + 4xy - 4x \\ 2x + y = 3 \end{cases}$$

$$\begin{cases} 4x + y = 0 \\ 2x + y = 3 \end{cases} \quad (-1)$$

$$\begin{cases} 4x + y = 0 \\ -2x - y = -3 \end{cases}$$

$$2x \;\; // = -3$$

$$\begin{cases} x = -\frac{3}{2} \\ y = -4x = -4\left(-\frac{3}{2}\right) \\ \qquad = 6 \end{cases}$$

$$\begin{cases} x = -\frac{3}{2} \\ y = 6 \end{cases}$$

269 $\begin{cases} (x-1)(x+2) = x^2 - y - 2 \\ \frac{1}{2}(x+y) = -\frac{1}{3}(x-y-1) \end{cases}$ $\left[\left(\frac{1}{2}, -\frac{1}{2}\right)\right]$

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

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

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

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

METODO DI CRAMER

$$\begin{cases} ax + by = c \\ a'x + b'y = c' \end{cases}$$

FORMA NORMALE

$$\begin{bmatrix} a & b \\ a' & b' \end{bmatrix}$$

MATRICE DEI COEFFICIENTI

$$D = \begin{vmatrix} a & b \\ a' & b' \end{vmatrix} = ab' - ba'$$

DETERMINANTE DELLA MATRICE DEI COEFFICIENTI

$$D_x = \begin{vmatrix} c & b \\ c' & b' \end{vmatrix} = cb' - bc'$$

$$D_y = \begin{vmatrix} a & c \\ a' & c' \end{vmatrix} = ac' - a'c$$

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

ESEMPIO

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

$$\begin{bmatrix} 1 & 1 \\ 2 & -3 \end{bmatrix}$$

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

$$D_x = \begin{vmatrix} 3 & 1 \\ 1 & -3 \end{vmatrix} = 3(-3) - 1 \cdot 1 = -10$$

$$D_y = \begin{vmatrix} 1 & 3 \\ 2 & 1 \end{vmatrix} = 1 \cdot 1 - 3 \cdot 2 = -5$$

$$\begin{cases} x = \dfrac{-10}{-5} = 2 \\ y = \dfrac{-5}{-5} = 1 \end{cases}$$

179 $\begin{cases} 2x = 3(y+1) \\ x - 2y = -1 \end{cases}$

Risolvere col metodo di Cramer

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

$$D = \begin{vmatrix} 2 & -3 \\ 1 & -2 \end{vmatrix} = 2(-2) - (-3)\cdot 1 = -4 + 3 = -1$$

$$D_x = \begin{vmatrix} 3 & -3 \\ -1 & -2 \end{vmatrix} = 3(-2) - (-3)(-1) = -6 - 3 = -9$$

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

$$\begin{cases} x = \dfrac{D_x}{D} = \dfrac{-9}{-1} = 9 \\ y = \dfrac{D_y}{D} = \dfrac{-5}{-1} = 5 \end{cases}$$

180 $\begin{cases} 4x - 6y = -1 \\ \frac{1}{3}x - \frac{1}{2}y = 2 \end{cases}$

$$D = \begin{vmatrix} 4 & -6 \\ \frac{1}{3} & -\frac{1}{2} \end{vmatrix} = 4\left(-\frac{1}{2}\right) - (-6)\cdot\frac{1}{3} = -2 + 2 = 0$$

il sistema è impossibile o indeterminato

$$D_x = \begin{vmatrix} -1 & -6 \\ 2 & -\frac{1}{2} \end{vmatrix} = (-1)\left(-\frac{1}{2}\right) - (-6)\cdot 2 = \frac{1}{2} + 12 = \frac{25}{2} \neq 0$$

SISTEMA IMPOSSIBILE

REGOLA

$D \neq 0 \Rightarrow$ SISTEMA DETERMINATO

$D = 0$ ↗ $D_x \neq 0$ oppure $D_y \neq 0 \Rightarrow$ SISTEMA IMPOSSIBILE

$D = 0$ ↘ $D_x = 0$ e $D_y = 0 \Rightarrow$ SISTEMA INDETERMINATO

190 $\begin{cases} 2x - y + 1 = 0 \\ 10x - 5y + 5 = 0 \end{cases}$

$$\begin{cases} 2x - y = -1 \\ 10x - 5y = -5 \end{cases} \qquad D = \begin{vmatrix} 2 & -1 \\ 10 & -5 \end{vmatrix} = -10 + 10 = 0$$

$$D_x = \begin{vmatrix} -1 & -1 \\ -5 & -5 \end{vmatrix} = 5 - 5 = 0$$

SISTEMA INDETERMINATO

$$D_y = \begin{vmatrix} 2 & -1 \\ 10 & -5 \end{vmatrix} = -10 + 10 = 0$$

ATTENZIONE

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

$$D = \begin{vmatrix} 1 & 2 \\ 2 & 0 \end{vmatrix} = 1 \cdot 0 - 2 \cdot 2 = -4$$

$$D_x = \begin{vmatrix} 1 & 2 \\ 2 & 0 \end{vmatrix} = -4 \qquad D_y = \begin{vmatrix} 1 & 1 \\ 2 & 2 \end{vmatrix} = 1 \cdot 2 - 1 \cdot 2 = 0$$

$$x = \frac{D_x}{D} = \frac{-4}{-4} = 1 \qquad y = \frac{0}{-4} = 0$$

$$\begin{cases} x = 1 \\ y = 0 \end{cases}$$

328 $\begin{cases} x = y - z + 1 \\ z = 2x - y \\ y = 2x + 1 \end{cases}$ $[(-3, -5, -1)]$

$$\begin{cases} // \\ z = 2(y - z + 1) - y \\ y = 2(y - z + 1) + 1 \end{cases} \qquad \begin{cases} // \\ z = 2y - 2z + 2 - y \\ y = 2y - 2z + 2 + 1 \end{cases}$$

$$\begin{cases} // \\ 3z = y + 2 \\ -y = -2z + 3 \end{cases} \qquad \begin{cases} // \\ y = 3z - 2 \\ -(3z - 2) = -2z + 3 \end{cases} \qquad \begin{cases} // \\ // \\ -3z + 2 = -2z + 3 \end{cases}$$

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