

(SISTEMI LINEARI **)**

(* PRIMO SISTEMA *)

a = {{2, -1, 3, 1}, {-2, 3, -1, -2}, {3, -2, 2, -1}};
MatrixForm[a]

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

a1 = {a[[1]], a[[1]] + a[[2]], 3*a[[1]] - 2*a[[3]]};
MatrixForm[a1]

$$\begin{pmatrix} 2 & -1 & 3 & 1 \\ 0 & 2 & 2 & -1 \\ 0 & 1 & 5 & 5 \end{pmatrix}$$

a2 = {a1[[1]], a1[[2]], a1[[2]] - 2*a1[[3]]};
MatrixForm[a2]

$$\begin{pmatrix} 2 & -1 & 3 & 1 \\ 0 & 2 & 2 & -1 \\ 0 & 0 & -8 & -11 \end{pmatrix}$$

x3 = 11/8

x2 = (-1 - 2*x3) / 2

x1 = (1 + x2 - 3*x3) / 2

$$\frac{11}{8}$$

$$-\frac{15}{8}$$

$$-\frac{5}{2}$$

Clear[x1, x2, x3];

aa = {{2, -1, 3}, {-2, 3, -1}, {3, -2, 2}};

x = {x1, x2, x3};

b = {1, -2, -1};

sys = Dot[aa, x] == b

Solve[sys, x]

{2 x1 - x2 + 3 x3, -2 x1 + 3 x2 - x3, 3 x1 - 2 x2 + 2 x3} == {1, -2, -1}

$$\left\{ \left\{ x1 \rightarrow -\frac{5}{2}, x2 \rightarrow -\frac{15}{8}, x3 \rightarrow \frac{11}{8} \right\} \right\}$$

(* ALTRO ESEMPIO *)

a = {{1, -3, 4, 5}, {2, 3, 4, -1}, {5, -5, 2, 3}, {-1, -2, 7, 6}};

MatrixForm[a]

$$\begin{pmatrix} 1 & -3 & 4 & 5 \\ 2 & 3 & 4 & -1 \\ 5 & -5 & 2 & 3 \\ -1 & -2 & 7 & 6 \end{pmatrix}$$

a1 = {a[[1]], 2 a[[1]] - a[[2]], 5*a[[1]] - a[[3]], a[[1]] + a[[4]]};

MatrixForm[a1]

$$\begin{pmatrix} 1 & -3 & 4 & 5 \\ 0 & -9 & 4 & 11 \\ 0 & -10 & 18 & 22 \\ 0 & -5 & 11 & 11 \end{pmatrix}$$

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a2 = {a1[[1]], a1[[2]], 9*a1[[3]] - 10*a1[[2]], 9*a1[[4]] - 5*a1[[2]]};  
MatrixForm[a2]
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$$\begin{pmatrix} 1 & -3 & 4 & 5 \\ 0 & -9 & 4 & 11 \\ 0 & 0 & 122 & 88 \\ 0 & 0 & 79 & 44 \end{pmatrix}$$