

(SISTEMI LINEARI **)**

(* ESEMPIO CON SCAMBIO DI RIGHE *)

Clear[a];

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

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

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

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

a2 = {a1[[1]], a1[[3]], a1[[2]], a1[[4]]}; (* SCAMBIO *)
MatrixForm[a2]

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

a3 = {a2[[1]], a2[[2]], a2[[4]], a2[[3]]}; (* SCAMBIO *)
MatrixForm[a3]

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

a4 = {a3[[1]], a3[[2]], a3[[2]] - 2 * a3[[3]], a3[[4]]};
MatrixForm[a4]

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

a5 = {a4[[1]], a4[[2]], a4[[3]], a4[[3]] + a4[[4]]};
MatrixForm[a5]

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

(* ESEMPIO CON NESSUNA SOLUZIONE *)

Clear[a, a1, a2, a3, a4, a5, b];

a = {{1, 2, 3, 1}, {2, 4, 6, 3}, {-1, 0, 2, -2}};
MatrixForm[a]

$$\begin{pmatrix} 1 & 2 & 3 & 1 \\ 2 & 4 & 6 & 3 \\ -1 & 0 & 2 & -2 \end{pmatrix}$$

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

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

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

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

(* ESEMPIO CON INFINITE SOLUZIONI *)

```
Clear[a, a1, a2, a3, a4, a5, b];
a = {{1, 2, 3, 1}, {2, 4, 6, 2}, {-1, 0, 2, -2}};
MatrixForm[a]
```

$$\begin{pmatrix} 1 & 2 & 3 & 1 \\ 2 & 4 & 6 & 2 \\ -1 & 0 & 2 & -2 \end{pmatrix}$$

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

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

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

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