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> # Chemical balance, Lay textbook chapter 1. 22 Jan 2019
> A:=<3,0,-1,0|8,0,0,-2|0,2,-2,-1>^+;

```

$$A := \begin{bmatrix} 3 & 0 & -1 & 0 \\ 8 & 0 & 0 & -2 \\ 0 & 2 & -2 & -1 \end{bmatrix} \quad (1)$$

```

> with(LinearAlgebra):
> LinearSolve(A,<0,0,0>,free=t);

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$$\begin{bmatrix} t_1 \\ 5 t_1 \\ 3 t_1 \\ 4 t_1 \end{bmatrix} \quad (2)$$

```

> ReducedRowEchelonForm(A);

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$$\begin{bmatrix} 1 & 0 & 0 & -\frac{1}{4} \\ 0 & 1 & 0 & -\frac{5}{4} \\ 0 & 0 & 1 & -\frac{3}{4} \end{bmatrix} \quad (3)$$

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> eqs:=GenerateEquations(A,[v1,v2,v3,v4]);

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$$eqs := [3 v1 - v3 = 0, 8 v1 - 2 v4 = 0, 2 v2 - 2 v3 - v4 = 0] \quad (4)$$

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> solve(eqs,{v1,v2,v3,v4});

```

$$\{v1 = v1, v2 = 5 v1, v3 = 3 v1, v4 = 4 v1\} \quad (5)$$