

> restart: with(LinearAlgebra):

Opgave 1

> C:=<<1|-2|-1|-1|a>, <1|2|1|2|b>,
<2|1|-3|0|c>, <1|3|-2|1|d>>;

$$C := \begin{bmatrix} 1 & -2 & -1 & -1 & a \\ 1 & 2 & 1 & 2 & b \\ 2 & 1 & -3 & 0 & c \\ 1 & 3 & -2 & 1 & d \end{bmatrix}$$

> GaussianElimination(C);

$$\begin{bmatrix} 1 & -2 & -1 & -1 & a \\ 0 & 4 & 2 & 3 & b-a \\ 0 & 0 & -\frac{7}{2} & -\frac{7}{4} & c-\frac{3}{4}a-\frac{5}{4}b \\ 0 & 0 & 0 & 0 & d+a-c \end{bmatrix}$$

Opgave 4

> B:=Matrix([[[-5,-3,3,-3],[-3,-5,-3,3],
[3,-3,-5,-3],[-3,3,-3,-5]]]);

$$B := \begin{bmatrix} -5 & -3 & 3 & -3 \\ -3 & -5 & -3 & 3 \\ 3 & -3 & -5 & -3 \\ -3 & 3 & -3 & -5 \end{bmatrix}$$

> Eigenvectors(B);

$$\begin{bmatrix} -8 \\ -8 \\ -8 \\ 4 \end{bmatrix}, \begin{bmatrix} -1 & 1 & 1 & -1 \\ 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & 1 \end{bmatrix}$$