Geogebra: https://www.geogebra.org/classic

Matice

- Násobení matic

  {{1, 2}, {3, 4}, {5, 6}} * {{1, 2, 3}, {4, 5, 6}}

$$M_1 = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix} \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix} \quad M_1 = \begin{pmatrix} 9 & 12 & 15 \\ 19 & 26 & 33 \\ 29 & 40 & 51 \end{pmatrix}$$

- Inverzní matice

```
Invert({{1, 2}, {3, 4}})
```

$$M_2 = \text{Invertovat}\left(\{\{1, 2\}, \{3, 4\}\}\right)$$

$$\rightarrow \begin{pmatrix} -2 & 1 \\ 1.5 & -0.5 \end{pmatrix}$$

Zkouška: M_{3}= {{1,2},{3,4}} {{-2,1},{1.5,-0.5}}

$$M_3 = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} -2 & 1 \\ 1.5 & -0.5 \end{pmatrix} \quad M_3 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

Polynomy

- Kořeny polynomu
  solve(x^2-2x-3) nebo Vyresit(x^(2)-2x-3)

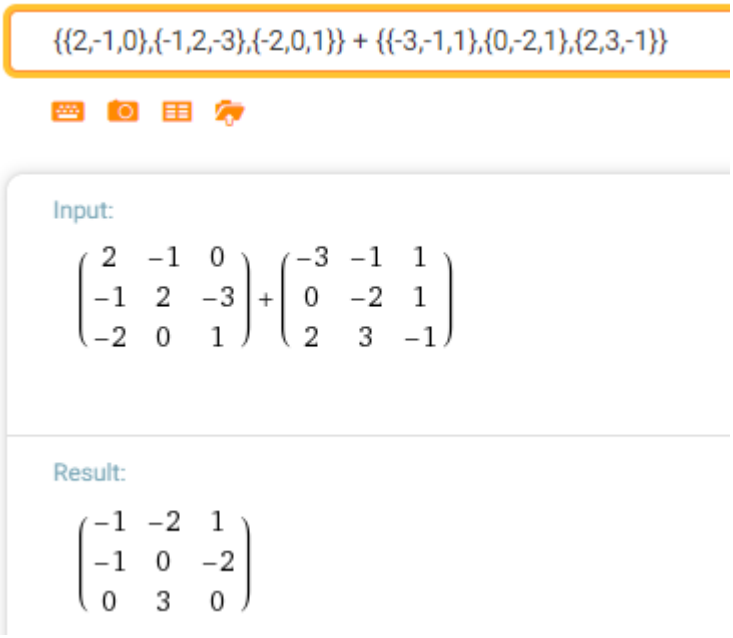
- Rozklad na součin
  rozklad(x^(2)-2x-3) nebo factor(x^(5)-8x^(3)-6x^(2)+7x+6)

Soustavy rovnic

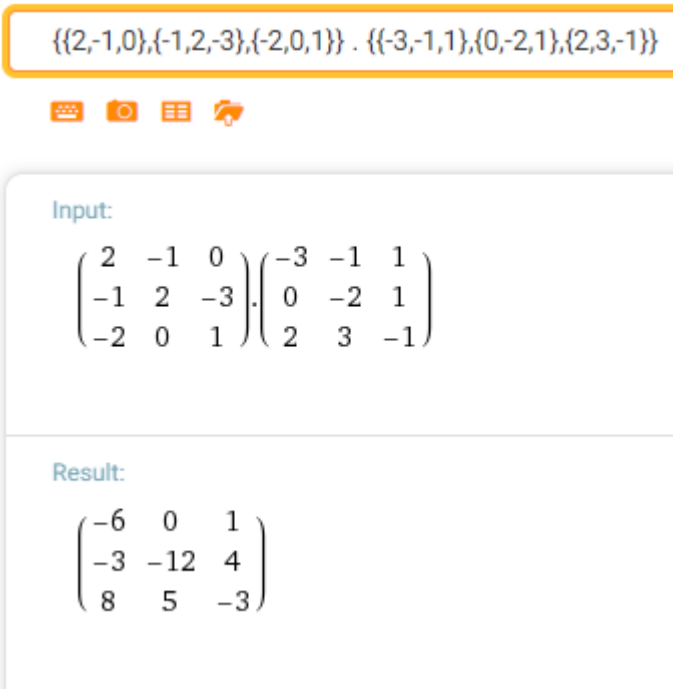
vyresit[{2x+3y-z=9,x-y+z=-2,-x+2y-3z=6}]

Wolframalpha – návodná prezentace
http://user.mendelu.cz/qqrihova/zvm/PDF_WA/W_algebra.pdf

- Součet matic



- Součin matic

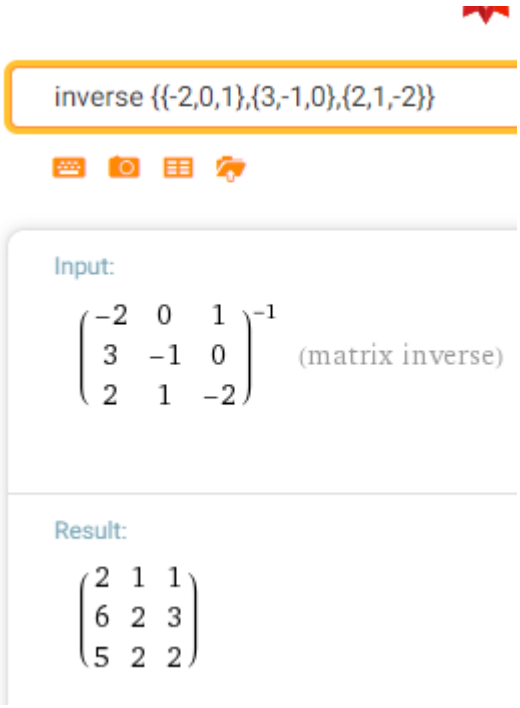


- Hodnost matice

  rank {{2,-1,-1},{-1,2,0},{0,2,-1},{-1,5,2}}

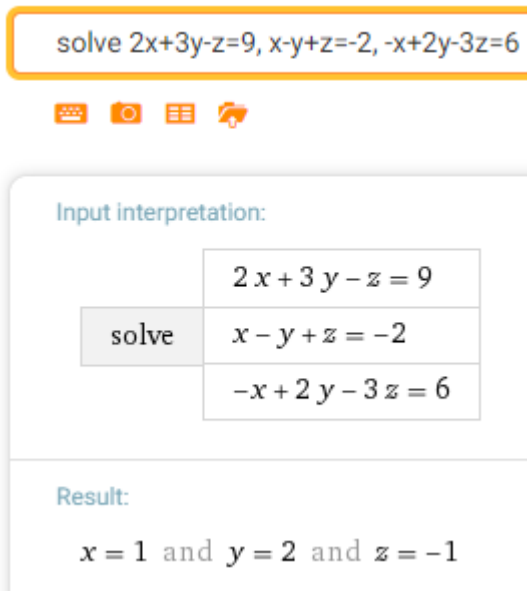
- Inverzní matice

  inverse {{-2,0,1},{3,-1,0},{2,1,-2}}



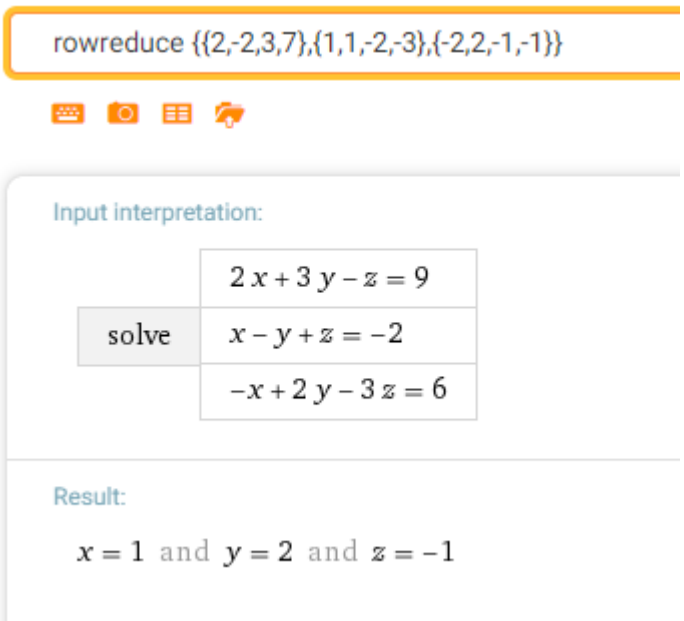
Soustava rovnic

solve 2x+3y-z=9, x-y+z=-2, -x+2y-3z=6



- **Maticový přístup**
  rowreduce {{2,-2,3,7},{1,1,-2,-3},{-2,2,-1,-1}}

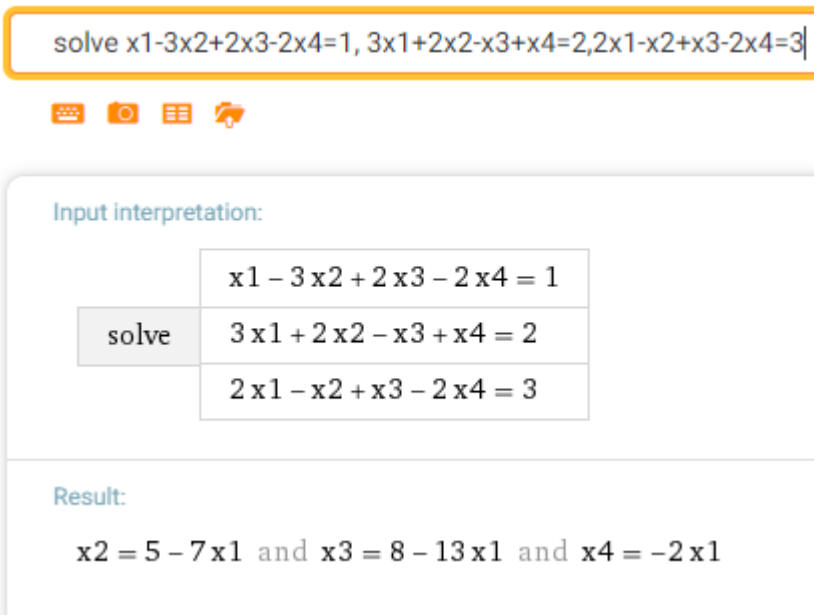
  - pravá strana je čtvrtý sloupec



- **Gaussova eliminační metoda:**

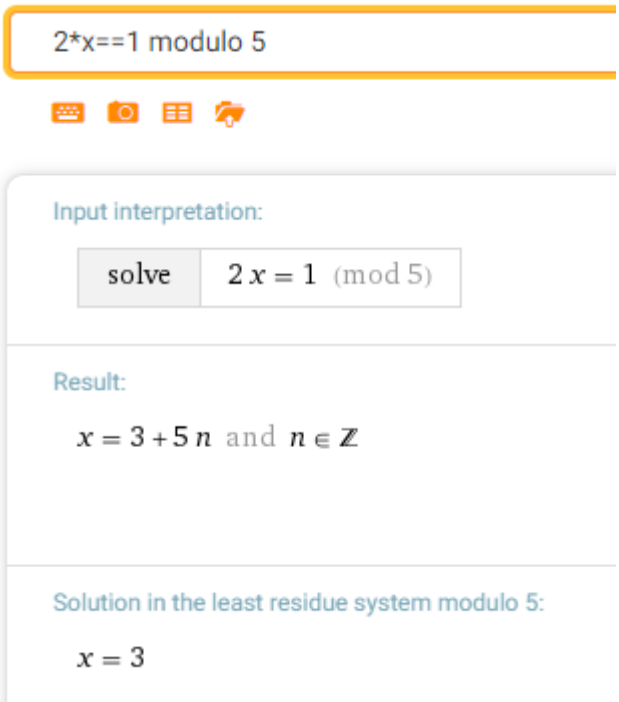
  - nekonečně mnoho řešení

  solve x1-3x2+2x3-2x4=1, 3x1+2x2-x3+x4=2,2x1-x2+x3-2x4=3



Kongruence

2*x==1 modulo 5



Polynomy

- Dosazení do polynomu: {x^4-7x^3+6x^2+28x-10, x=-1}

- Kořeny polynomu
  solve(x^2-2x-3)

- Rozklad na součin
  factor x^5-8x^3-6x^2+7x+6