MATRICE I DETERMINANTE

Matrice:

1) zbrajanje matrica $\begin{bmatrix} 2 & 4 & 4 \\ 1 & 3 & -1 \end{bmatrix} + \begin{bmatrix} 7 & 9 & 3 \\ 2 & -1 & 1 \end{bmatrix} = \begin{bmatrix} 9 & 13 & 7 \\ 3 & 2 & 0 \end{bmatrix}$

2) oduzimanje matrica $\begin{bmatrix} 2 & 4 & 4 \\ 1 & 3 & -1 \end{bmatrix} - \begin{bmatrix} 7 & 9 & 3 \\ 2 & -1 & 1 \end{bmatrix} = \begin{bmatrix} -5 & -5 & 1 \\ -1 & 4 & -2 \end{bmatrix}$

3) množenje matrica $\begin{bmatrix} a & b \\ c & d \end{bmatrix} \cdot \begin{bmatrix} e & f \\ g & h \end{bmatrix} = \begin{bmatrix} ae+bg & af+bh \\ ce+dg & cf+dh \end{bmatrix}$

4) potenciranje matrica $\begin{bmatrix} a & b \\ c & d \end{bmatrix}^2 = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \cdot \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} a^2+bc & ab+bd \\ ac+cd & bc+d^2 \end{bmatrix}$

5) jedinična matrica $E = I = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ — to je matrica u kojoj su na glavnoj dijagonali jedinice (drugo sve 0)

6) inverzna matrica $A^{-1} = \frac{1}{D} \cdot \tilde{A}$

npr $A = \begin{bmatrix} 2 & 3 \\ 5 & 8 \end{bmatrix}$ $D = \begin{vmatrix} 2 & 3 \\ 5 & 8 \end{vmatrix} = 1$ $A_{11} = 8$ $A_{12} = -5$ $A_{21} = -3$ $A_{22} = 2$ $A^{-1} = \begin{bmatrix} 8 & -3 \\ -5 & 2 \end{bmatrix}$

Determinante:

Determinante: $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$

Sarrusovo pravilo (za format 3×3)

$$\begin{vmatrix} 1 & 2 & 3 \\ 4 & 3 & 2 \\ 1 & 0 & -1 \end{vmatrix} \begin{matrix} 1 & 2 \\ 4 & 3 \\ 1 & 0 \end{matrix} = (-3+4+0) - (9+0-8) = 1 - 1 = \emptyset$$

po Laplasu: (format 4×4)

$$\begin{vmatrix} 1 & 2 & 5 & 3 \\ 1 & 2 & 1 & 3 \\ 4 & 1 & 3 & 7 \\ 2 & 3 & 4 & 1 \end{vmatrix} = -\begin{vmatrix} 1 & 2 & 5 & 3 \\ -1 & -2 & -1 & -3 \\ 4 & 1 & 3 & 7 \\ 2 & 3 & 4 & 1 \end{vmatrix} = -\begin{vmatrix} 1 & 2 & 5 & 3 \\ 0 & 0 & 4 & 0 \\ 4 & 1 & 3 & 7 \\ 2 & 3 & 4 & 1 \end{vmatrix} = -(-4)\begin{vmatrix} 1 & 2 & 3 \\ 4 & 1 & 7 \\ 2 & 3 & 1 \end{vmatrix}$$

$$= 4 \begin{vmatrix} 1 & 2 & 3 \\ 4 & 1 & 7 \\ 2 & 3 & 1 \end{vmatrix} \begin{matrix} 1 & 2 \\ 4 & 1 \\ 2 & 3 \end{matrix} = 4[(1+28+36) - (6+21+8)] = 120$$

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