Inverzna matrica i matrične jednadžbe

Matematika za ekonomiste 1

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FOI, Varaždin

Sadržaj

Inverzna matrica

- Inverzna matrica kvadratne matrice A je matrica A^{-1} za koju vrijedi

$$AA^{-1} = A^{-1}A = I$$

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- kvadratna matrica reda 3

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$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \qquad A^* = \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

prvi zadatak

Zadatak 1

Odredite inverzne matrice sljedećih matrica:

a) $A = \begin{bmatrix} 2 & 1 \\ -5 & 4 \end{bmatrix}$

b) $B = \dfrac{2}{3}\begin{bmatrix} 3 & 5 \\ 1 & -3 \end{bmatrix}$

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a) $\det A = 2 \cdot 4 - (-5) \cdot 1 = 8 + 5$

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$$= -\frac{3}{28}$$

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b) $B = \frac{2}{3}\begin{bmatrix} 3 & 5 \\ 1 & -3 \end{bmatrix}$

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

$$A^{-1} = \frac{1}{\det A}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

Rješenje

a) $\det A = 2 \cdot 4 - (-5) \cdot 1 = 8 + 5 = 13$

$$A^{-1} = \frac{1}{13}\begin{bmatrix} 4 & -1 \\ 5 & 2 \end{bmatrix}$$

b) $\boxed{(kA)^{-1} = k^{-1}A^{-1}}$

$$B^{-1} = \left(\frac{2}{3}\right)^{-1} \cdot \begin{bmatrix} 3 & 5 \\ 1 & -3 \end{bmatrix}^{-1} =$$

$$= \frac{3}{2} \cdot \frac{1}{-14}\begin{bmatrix} -3 & -5 \\ -1 & 3 \end{bmatrix} =$$

$$= -\frac{3}{28}\begin{bmatrix} -3 & -5 \\ -1 & 3 \end{bmatrix}$$

drugi zadatak

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Rješenje

$$A^{-1} =$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Rješenje

$$A^{-1} =$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5}B^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5}B^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

$$\boxed{B^{-1} = \frac{1}{\det B}\cdot B^*}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B =$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5}B^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

$$\boxed{B^{-1} = \frac{1}{\det B}\cdot B^*}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = \begin{vmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{vmatrix}$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1} \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5} B^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^{*}}$$

Zadatak 2

Odredite inverznu matricu matrice

$$A = \frac{5}{3}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}.$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = \begin{vmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{vmatrix} = -138$$

Rješenje

$$A^{-1} = \left(\frac{5}{3}\right)^{-1}\begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}^{-1} = \frac{3}{5}B^{-1}$$

$$\boxed{(kA)^{-1} = k^{-1}A^{-1}}$$

$$\boxed{B^{-1} = \frac{1}{\det B}\cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} =$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} =$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} =$$

$$B = \begin{bmatrix} 1 & 5 & 6 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 6 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} =$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{22} =$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{23} =$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} =$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} =$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix} = 17$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix} = 17$$

$$B_{33} =$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix} = 17$$

$$B_{33} = (-1)^{3+3} \begin{vmatrix} 1 & 5 \\ 2 & 3 \end{vmatrix}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix} = 17$$

$$B_{33} = (-1)^{3+3} \begin{vmatrix} 1 & 5 \\ 2 & 3 \end{vmatrix} = -7$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\boxed{A_{ij} = (-1)^{i+j} M_{ij}}$$

$$B_{11} = (-1)^{1+1} \begin{vmatrix} 3 & -1 \\ -5 & -9 \end{vmatrix} = -32$$

$$B_{12} = (-1)^{1+2} \begin{vmatrix} 2 & -1 \\ 4 & -9 \end{vmatrix} = 14$$

$$B_{13} = (-1)^{1+3} \begin{vmatrix} 2 & 3 \\ 4 & -5 \end{vmatrix} = -22$$

$$B_{21} = (-1)^{2+1} \begin{vmatrix} 5 & 8 \\ -5 & -9 \end{vmatrix} = 5$$

$$B_{22} = (-1)^{2+2} \begin{vmatrix} 1 & 8 \\ 4 & -9 \end{vmatrix} = -41$$

$$B_{23} = (-1)^{2+3} \begin{vmatrix} 1 & 5 \\ 4 & -5 \end{vmatrix} = 25$$

$$B_{31} = (-1)^{3+1} \begin{vmatrix} 5 & 8 \\ 3 & -1 \end{vmatrix} = -29$$

$$B_{32} = (-1)^{3+2} \begin{vmatrix} 1 & 8 \\ 2 & -1 \end{vmatrix} = 17$$

$$B_{33} = (-1)^{3+3} \begin{vmatrix} 1 & 5 \\ 2 & 3 \end{vmatrix} = -7$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$B^{-1} =$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{aligned} &B_{11} = -32, \quad &B_{12} = 14, \quad &B_{13} = -22 \\ &B_{21} = 5, \quad &B_{22} = -41, \quad &B_{23} = 25 \\ &B_{31} = -29, \quad &B_{32} = 17, \quad &B_{33} = -7 \end{aligned}$$

$$B^{-1} = \frac{1}{-138}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$B_{11} = -32, \quad B_{12} = 14, \quad B_{13} = -22$$
$$B_{21} = 5, \quad B_{22} = -41, \quad B_{23} = 25$$
$$B_{31} = -29, \quad B_{32} = 17, \quad B_{33} = -7$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & & \\ & & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

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$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & \\ & & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{array}{lll} B_{11} = -32, & B_{12} = 14, & B_{13} = -22 \\ B_{21} = 5, & B_{22} = -41, & B_{23} = 25 \\ B_{31} = -29, & B_{32} = 17, & B_{33} = -7 \end{array}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ & & \\ & & \end{bmatrix}$$

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$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^{*}}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

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$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{array}{lll} B_{11} = -32, & B_{12} = 14, & B_{13} = -22 \\ B_{21} = 5, & B_{22} = -41, & B_{23} = 25 \\ B_{31} = -29, & B_{32} = 17, & B_{33} = -7 \end{array}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & & \end{bmatrix}$$

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$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & \end{bmatrix}$$

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$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}$$

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$$\begin{array}{lll} B_{11} = -32, & B_{12} = 14, & B_{13} = -22 \\ B_{21} = 5, & B_{22} = -41, & B_{23} = 25 \\ B_{31} = -29, & B_{32} = 17, & B_{33} = -7 \end{array}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & & \\ 14 & & \\ -22 & & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$\begin{array}{lll} B_{11} = -32, & B_{12} = 14, & B_{13} = -22 \\ B_{21} = 5, & B_{22} = -41, & B_{23} = 25 \\ B_{31} = -29, & B_{32} = 17, & B_{33} = -7 \end{array}$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & \\ 14 & -41 & \\ -22 & 25 & \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{array}{lll} B_{11} = -32, & B_{12} = 14, & B_{13} = -22 \\ B_{21} = 5, & B_{22} = -41, & B_{23} = 25 \\ B_{31} = -29, & B_{32} = 17, & B_{33} = -7 \end{array}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

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$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} &B_{11} = -32, \quad &B_{12} = 14, \quad &B_{13} = -22 \\ &B_{21} = 5, \quad &B_{22} = -41, \quad &B_{23} = 25 \\ &B_{31} = -29, \quad &B_{32} = 17, \quad &B_{33} = -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} &B_{11} = -32, && B_{12} = 14, && B_{13} = -22 \\ &B_{21} = 5, && B_{22} = -41, && B_{23} = 25 \\ &B_{31} = -29, && B_{32} = 17, && B_{33} = -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1} = \frac{3}{5} \cdot$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\det B = -138$$

$$B_{11} = -32, \quad B_{12} = 14, \quad B_{13} = -22$$
$$B_{21} = 5, \quad B_{22} = -41, \quad B_{23} = 25$$
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$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1} = \frac{3}{5} \cdot \frac{-1}{138}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1} = \frac{3}{5} \cdot \frac{-1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1} = \frac{3}{5} \cdot \frac{-1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix} = \frac{-1}{230}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

$$B = \begin{bmatrix} 1 & 5 & 8 \\ 2 & 3 & -1 \\ 4 & -5 & -9 \end{bmatrix}$$

$$\begin{aligned} B_{11} &= -32, & B_{12} &= 14, & B_{13} &= -22 \\ B_{21} &= 5, & B_{22} &= -41, & B_{23} &= 25 \\ B_{31} &= -29, & B_{32} &= 17, & B_{33} &= -7 \end{aligned}$$

$$\det B = -138$$

$$B^{-1} = \frac{1}{-138} \begin{bmatrix} -32 & 14 & -22 \\ 5 & -41 & 25 \\ -29 & 17 & -7 \end{bmatrix}^T = -\frac{1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{3}{5} B^{-1} = \frac{3}{5} \cdot \frac{-1}{138} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix} = \frac{-1}{230} \begin{bmatrix} -32 & 5 & -29 \\ 14 & -41 & 17 \\ -22 & 25 & -7 \end{bmatrix}$$

$$\boxed{B^{-1} = \frac{1}{\det B} \cdot B^*}$$

treći zadatak

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$*. Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

a)
$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) =$$

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) =$$

$\boxed{\det(kA) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

a) $$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4$$

$\boxed{\det(kA) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \dfrac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

a)
$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot$$

$\boxed{\det(kA) = k^n \det A}$ $\quad$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3$$

$\boxed{\det(kA) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. Izračunajte:

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right)$

b) $\det\left(A^{-1}A^{T}\right)^{-2}$

Rješenje

$\boxed{\det\left(A^{m}\right) = (\det A)^{m}}$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right) = \left(\frac{1}{2}\right)^{4} \cdot \det\left(A^{-1}\right)^{3} = \frac{1}{16} \cdot$$

$\boxed{\det(kA) = k^{n} \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right)$

b) $\det\left(A^{-1}A^{T}\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^{m}\right) = \left(\det A\right)^{m}}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right) = \left(\frac{1}{2}\right)^{4} \cdot \det\left(A^{-1}\right)^{3} = \frac{1}{16} \cdot \left(\det A^{-1}\right)^{3}$$

$\boxed{\det\left(kA\right) = k^{n} \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16}\,.$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3$$

$\boxed{\det(kA) = k^n \det A}$ $\quad$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

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Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

$$\boxed{\det\left(kA\right) = k^n \det A}$$

n je red kvadratne matrice A

Zadatak 3

Neka je A *regularna matrica reda* 4 *i* $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$ b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = (\det A)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} =$$

$$\boxed{\det(kA) = k^n \det A}$$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} = \det\left(A^{-1}A^T\right)$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$

a)
$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$
$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)
$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2}$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right)$ b) $\det\left(A^{-1}A^{T}\right)^{-2}$

Rješenje

$\boxed{\det\left(A^{m}\right) = \left(\det A\right)^{m}}$ $\boxed{\det\left(AB\right) = \det A \det B}$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right) = \left(\frac{1}{2}\right)^{4} \cdot \det\left(A^{-1}\right)^{3} = \frac{1}{16} \cdot \left(\det A^{-1}\right)^{3} =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^{3} = \frac{1}{16} \cdot 4^{3} = 4$$

b)

$$\det\left(A^{-1}A^{T}\right)^{-2} = \left(\det\left(A^{-1}A^{T}\right)\right)^{-2} = \left(\qquad\qquad\qquad\right)^{-2}$$

$\boxed{\det\left(kA\right) = k^{n}\det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

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Rješenje

$\boxed{\det\left(A^m\right) = (\det A)^m}$ $\boxed{\det\left(AB\right) = \det A \det B}$

a)
$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$
$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)
$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \qquad\qquad \right)^{-2}$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

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Rješenje

$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$ $\boxed{\det\left(AB\right) = \det A \det B}$

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$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \det A^T\right)^{-2}$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

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$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$ $\boxed{\det\left(AB\right) = \det A \det B}$

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$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \det A^T\right)^{-2} =$$

$$= \left(\qquad\qquad \right)^{-2}$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

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Rješenje

$\boxed{\det\left(A^m\right) = \left(\det A\right)^m}$ $\boxed{\det\left(AB\right) = \det A \det B}$

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$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \det A^T\right)^{-2} =$$

$$= \left(\frac{1}{\det A} \qquad\qquad\right)^{-2}$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

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Rješenje

$\boxed{\det(A^m) = (\det A)^m}$ $\boxed{\det(AB) = \det A \det B}$

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$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16}\cdot\left(\det A^{-1}\right)^3 =$$
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$$= \left(\frac{1}{\det A}\cdot \qquad\right)^{-2}$$

$\boxed{\det(kA) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

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Rješenje

$\boxed{\det(A^m) = (\det A)^m}$ $\boxed{\det(AB) = \det A \det B}$

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$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \det A^T\right)^{-2} =$$
$$= \left(\frac{1}{\det A} \cdot \det A\right)^{-2}$$

$\boxed{\det(kA) = k^n \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right)$

b) $\det\left(A^{-1}A^{T}\right)^{-2}$

Rješenje

$\boxed{\det\left(A^{m}\right) = \left(\det A\right)^{m}}$ $\boxed{\det\left(AB\right) = \det A \det B}$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^{3}\right) = \left(\frac{1}{2}\right)^{4} \cdot \det\left(A^{-1}\right)^{3} = \frac{1}{16} \cdot \left(\det A^{-1}\right)^{3} =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^{3} = \frac{1}{16} \cdot 4^{3} = 4$$

b)

$$\det\left(A^{-1}A^{T}\right)^{-2} = \left(\det\left(A^{-1}A^{T}\right)\right)^{-2} = \left(\det A^{-1} \det A^{T}\right)^{-2} =$$

$$= \left(\frac{1}{\det A} \cdot \det A\right)^{-2} = 1^{-2}$$

$\boxed{\det\left(kA\right) = k^{n} \det A}$ n je red kvadratne matrice A

Zadatak 3

Neka je A regularna matrica reda 4 i $\det A = \frac{1}{4}$. *Izračunajte:*

a) $\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right)$

b) $\det\left(A^{-1}A^T\right)^{-2}$

Rješenje

$\boxed{\det\left(A^m\right) = (\det A)^m}$ $\boxed{\det\left(AB\right) = \det A \det B}$

a)

$$\det\left(\frac{1}{2}\left(A^{-1}\right)^3\right) = \left(\frac{1}{2}\right)^4 \cdot \det\left(A^{-1}\right)^3 = \frac{1}{16} \cdot \left(\det A^{-1}\right)^3 =$$

$$= \frac{1}{16} \cdot \left(\frac{1}{\det A}\right)^3 = \frac{1}{16} \cdot 4^3 = 4$$

b)

$$\det\left(A^{-1}A^T\right)^{-2} = \left(\det\left(A^{-1}A^T\right)\right)^{-2} = \left(\det A^{-1} \det A^T\right)^{-2} =$$

$$= \left(\frac{1}{\det A} \cdot \det A\right)^{-2} = 1^{-2} = 1$$

$\boxed{\det\left(kA\right) = k^n \det A}$ n je red kvadratne matrice A

Napomena

$$A^{-n} = \left(A^{-1}\right)^n, \quad n \in \mathbb{N}$$

Na primjer,

$$A^{-3} = \left(A^{-1}\right)^3$$

četvrti zadatak

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$AX = B$	$XA = B$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX)$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX) =$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX) = A^{-1}B$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX) = A^{-1}B$$

$$(A^{-1}A)X$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX) = A^{-1}B$$

$$(A^{-1}A)X = A^{-1}B$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$A^{-1} \cdot / \; AX = B$$

$$A^{-1}(AX) = A^{-1}B$$

$$(A^{-1}A)X = A^{-1}B$$

$$I \cdot X$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$
\begin{aligned}
{\color{blue}A^{-1}\cdot /}\; AX &= B \\
A^{-1}(AX) &= A^{-1}B \\
(A^{-1}A)X &= A^{-1}B \\
I \cdot X &= A^{-1}B
\end{aligned}
$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$\begin{aligned} A^{-1}\cdot / \; AX &= B \\ A^{-1}(AX) &= A^{-1}B \\ (A^{-1}A)X &= A^{-1}B \\ I\cdot X &= A^{-1}B \\ X &= A^{-1}B \end{aligned}$$

$$XA = B$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$
\begin{aligned}
A^{-1}\cdot \Big/\, AX &= B \\
A^{-1}(AX) &= A^{-1}B \\
(A^{-1}A)X &= A^{-1}B \\
I\cdot X &= A^{-1}B \\
X &= A^{-1}B
\end{aligned}
$$

$$
XA = B \,\Big/\cdot A^{-1}
$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$
\begin{aligned}
A^{-1} \cdot / \; AX &= B \\
A^{-1}(AX) &= A^{-1}B \\
(A^{-1}A)X &= A^{-1}B \\
I \cdot X &= A^{-1}B \\
X &= A^{-1}B
\end{aligned}
$$

$$
\begin{aligned}
XA = B \; &/ \cdot A^{-1} \\
(XA)A^{-1}
\end{aligned}
$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$\begin{aligned} A^{-1} \cdot / \; AX &= B \\ A^{-1}(AX) &= A^{-1}B \\ (A^{-1}A)X &= A^{-1}B \\ I \cdot X &= A^{-1}B \\ X &= A^{-1}B \end{aligned}$$

$$\begin{aligned} XA &= B \; / \cdot A^{-1} \\ (XA)A^{-1} &= \end{aligned}$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$
\begin{aligned}
A^{-1} \cdot / \; AX &= B \\
A^{-1}(AX) &= A^{-1}B \\
(A^{-1}A)X &= A^{-1}B \\
I \cdot X &= A^{-1}B \\
X &= A^{-1}B
\end{aligned}
$$

$$
\begin{aligned}
XA &= B \; / \cdot A^{-1} \\
(XA)A^{-1} &= BA^{-1}
\end{aligned}
$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$\begin{aligned} A^{-1} \cdot / \; AX &= B \\ A^{-1}(AX) &= A^{-1}B \\ (A^{-1}A)X &= A^{-1}B \\ I \cdot X &= A^{-1}B \\ X &= A^{-1}B \end{aligned}$$

$$\begin{aligned} XA &= B \; / \cdot A^{-1} \\ (XA)A^{-1} &= BA^{-1} \\ X(AA^{-1}) & \end{aligned}$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$\begin{aligned} A^{-1}\cdot / \; AX &= B \\ A^{-1}(AX) &= A^{-1}B \\ (A^{-1}A)X &= A^{-1}B \\ I \cdot X &= A^{-1}B \\ X &= A^{-1}B \end{aligned}$$

$$\begin{aligned} XA &= B \; / \cdot A^{-1} \\ (XA)A^{-1} &= BA^{-1} \\ X(AA^{-1}) &= BA^{-1} \end{aligned}$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$
\begin{aligned}
A^{-1} \cdot / \ AX &= B \\
A^{-1}(AX) &= A^{-1}B \\
(A^{-1}A)X &= A^{-1}B \\
I \cdot X &= A^{-1}B \\
X &= A^{-1}B
\end{aligned}
$$

$$
\begin{aligned}
XA &= B \ / \cdot A^{-1} \\
(XA)A^{-1} &= BA^{-1} \\
X(AA^{-1}) &= BA^{-1} \\
X \cdot I &
\end{aligned}
$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

$$\begin{aligned} A^{-1}\cdot /\; AX &= B \\ A^{-1}(AX) &= A^{-1}B \\ (A^{-1}A)X &= A^{-1}B \\ I\cdot X &= A^{-1}B \\ X &= A^{-1}B \end{aligned}$$

$$\begin{aligned} XA &= B \;/\cdot A^{-1} \\ (XA)A^{-1} &= BA^{-1} \\ X(AA^{-1}) &= BA^{-1} \\ X\cdot I &= BA^{-1} \end{aligned}$$

Matrične jednadžbe

- Neka je A kvadratna matrica i $\det A \neq 0$.

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I \cdot X &= A^{-1}B \\
X &= A^{-1}B
\end{aligned}
$$

$$
\begin{aligned}
XA &= B \; / \cdot A^{-1} \\
(XA)A^{-1} &= BA^{-1} \\
X(AA^{-1}) &= BA^{-1} \\
X \cdot I &= BA^{-1} \\
X &= BA^{-1}
\end{aligned}
$$

Zadatak 4

Riješite sljedeće matrične jednadžbe:

a) $AX = BX + C$

b) $AXB - 2XB = B + AB$

c) $B(XA - I) + B^2 + 2BXA = O$

d) $A^{-1}(I + A^2X)B = 2AX$

Rješenje

a)

$$AX = BX + C$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(\qquad)X$$

Rješenje

a)

$$
\begin{aligned}
AX &= BX + C \\
AX - BX &= C \\
(A - B)X
\end{aligned}
$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)X = C$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \; (A - B)X = C$$

$$X =$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \; (A - B)X = C$$

$$X = (A - B)^{-1}$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \; (A - B)X = C$$

$$X = (A - B)^{-1} C$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(\qquad\qquad)XB$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \; (A - B)X = C$$

$$X = (A - B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A - 2I)XB$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \, (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)XB =$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)XB = (\qquad\quad)B$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)XB = (I+A)B$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \, (A - B)X = C$$

$$X = (A - B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A - 2I)^{-1} \cdot / \, (A - 2I)XB = (I + A)B$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \; (A-2I)XB = (I+A)B$$

$$XB$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \, (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \, (A-2I)XB = (I+A)B$$

$$XB =$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \, (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \, (A-2I)XB = (I+A)B$$

$$XB = (A-2I)^{-1}$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A - B)^{-1} \cdot / \, (A - B)X = C$$

$$X = (A - B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A - 2I)^{-1} \cdot / \, (A - 2I)XB = (I + A)B$$

$$XB = (A - 2I)^{-1}(I + A)B$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \, (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \, (A-2I)XB = (I+A)B$$

$$XB = (A-2I)^{-1}(I+A)B \, / \cdot B^{-1}$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \; (A-2I)XB = (I+A)B$$

$$XB = (A-2I)^{-1}(I+A)B \; / \cdot B^{-1}$$

$$X$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \; (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \; (A-2I)XB = (I+A)B$$

$$XB = (A-2I)^{-1}(I+A)B \; / \cdot B^{-1}$$

$$X =$$

Rješenje

a)

$$AX = BX + C$$

$$AX - BX = C$$

$$(A-B)^{-1} \cdot / \, (A-B)X = C$$

$$X = (A-B)^{-1}C$$

b)

$$AXB - 2XB = B + AB$$

$$(A-2I)^{-1} \cdot / \, (A-2I)XB = (I+A)B$$

$$XB = (A-2I)^{-1}(I+A)B \, / \cdot B^{-1}$$

$$X = (A-2I)^{-1}(I+A)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

BXA

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA =$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \; \Big/ \cdot \frac{1}{3}$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \quad \Big/ \cdot \frac{1}{3}$$

$$BXA$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \quad \Big/ \cdot \frac{1}{3}$$

$$BXA =$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \quad \Big/ \cdot \frac{1}{3}$$

$$BXA = \frac{1}{3}\left(B - B^2\right)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \ \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \ BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA =$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA =$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \ \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \ BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \; \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(\qquad \qquad)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I \qquad)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \; \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - \quad)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \quad \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \quad BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B) \;\Big/ \cdot A^{-1}$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B) \;\Big/ \cdot A^{-1}$$

$$X$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B) \Big/ \cdot A^{-1}$$

$$X =$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B) \;\Big/ \cdot A^{-1}$$

$$X = \frac{1}{3}(I - B)$$

c)

$$B(XA - I) + B^2 + 2BXA = O$$

$$BXA - B + B^2 + 2BXA = O$$

$$3BXA = B - B^2 \;\Big/ \cdot \frac{1}{3}$$

$$B^{-1} \cdot \Big/ \; BXA = \frac{1}{3}\left(B - B^2\right)$$

$$XA = B^{-1} \cdot \frac{1}{3}\left(B - B^2\right)$$

$$XA = \frac{1}{3}(I - B) \;\Big/ \cdot A^{-1}$$

$$X = \frac{1}{3}(I - B)A^{-1}$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

d)

$$A^{-1}(I + A^2 X)B = 2AX$$

$$\Big(\qquad\qquad \Big) B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} \qquad\qquad \big)B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + \qquad\right)B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B$$

d)

$$A^{-1}(I + A^2 X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B +$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB$$

d)

$$A^{-1}(I + A^2 X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB -$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$AX(\qquad)$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$AX(B - 2I)$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$AX(B - 2I) =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$AX(B - 2I) = -A^{-1}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} + AX\big)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I)$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} + AX\big)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot \big/ \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} + AX\big)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I)$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} + AX\big)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B \; / \cdot (B - 2I)^{-1}$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\big(A^{-1} + AX\big)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B \; / \cdot (B - 2I)^{-1}$$

$$X$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B \; / \cdot (B - 2I)^{-1}$$

$$X =$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B \; / \cdot (B - 2I)^{-1}$$

$$X = -A^{-2}B$$

d)

$$A^{-1}(I + A^2X)B = 2AX$$

$$\left(A^{-1} + AX\right)B = 2AX$$

$$A^{-1}B + AXB = 2AX$$

$$AXB - 2AX = -A^{-1}B$$

$$AXB - AX \cdot 2I = -A^{-1}B$$

$$A^{-1} \cdot / \; AX(B - 2I) = -A^{-1}B$$

$$X(B - 2I) = A^{-1} \cdot (-A^{-1}B)$$

$$X(B - 2I) = -A^{-2}B \; / \cdot (B - 2I)^{-1}$$

$$X = -A^{-2}B(B - 2I)^{-1}$$

peti zadatak

Zadatak 5

Riješite matričnu jednadžbu $X - I = ABX$ *ako je*

$$A = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix}, \qquad B = \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix}.$$

Zadatak 5

Riješite matričnu jednadžbu $X - I = ABX$ *ako je*

$$A = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix}, \qquad B = \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix}.$$

Rješenje

$$X - I = ABX$$

Zadatak 5

Riješite matričnu jednadžbu $X - I = ABX$ *ako je*

$$A = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix}, \qquad B = \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix}.$$

Rješenje

$$X - I = ABX$$

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$$(I - AB)X$$

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Rješenje

$$X - I = ABX$$

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$$(I - AB)^{-1} \cdot / \, (I - AB)X = I$$

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$$X = (I - AB)^{-1} \cdot I$$

$$\boxed{X = (I - AB)^{-1}}$$

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$$AB =$$

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$$AB = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix}$$

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$$\boxed{X = (I - AB)^{-1}}$$

$$AB = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} 3 & \\ & \end{bmatrix}$$

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$$AB = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} 3 & -4 \\ & \end{bmatrix}$$

$$\boxed{X = (I - AB)^{-1}}$$

$$AB = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} 3 & -4 \\ 9 & \end{bmatrix}$$

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$$AB = \begin{bmatrix} 1 & -2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} -3 & -2 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} 3 & -4 \\ 9 & 6 \end{bmatrix}$$

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$$\det(I - AB) =$$

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$$\det(I - AB) = -2 \cdot (-5) - (-9) \cdot 4 = 10 + 36$$

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