Determinante

MATEMATIKA ZA EKONOMISTE 1

Damir Horvat

FOI, Varaždin

Sadržaj

prvi zadatak

Zadatak 1

Izračunajte sljedeće determinante:

a) $\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix}$, b) $\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix}$, c) $\begin{vmatrix} x-a & -a \\ a & x+a \end{vmatrix}$.

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} =$$

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

Rješenje

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

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

Rješenje

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

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

Rješenje

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

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} =$$

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

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

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

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

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

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

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5$$

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

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

Rješenje

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} =$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a)$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a) -$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a) - a \cdot (-a)$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a) - a \cdot (-a) = x^2 - a^2$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a) - a \cdot (-a) = x^2 - a^2 + a^2$$

Rješenje

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

$$\begin{vmatrix} 2 & 5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot 5 = -6 - 5 = -11$$

$$\begin{vmatrix} 2 & -5 \\ 1 & -3 \end{vmatrix} = 2 \cdot (-3) - 1 \cdot (-5) = -6 + 5 = -1$$

$$\begin{vmatrix} x - a & -a \\ a & x + a \end{vmatrix} = (x - a)(x + a) - a \cdot (-a) = x^2 - a^2 + a^2 = x^2$$

drugi zadatak

Zadatak 2

Izračunajte determinantu

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}$$

a) *Sarrusovim pravilom,*

b) *svođenjem na trokutastu determinantu,*

c) *Laplaceovim razvojem po trećem stupcu,*

d) *Laplaceovim razvojem po prvom retku.*

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}\begin{matrix} 9 \\ 8 \\ 2 \end{matrix}$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix}$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 9 & 4 & -5 & 9 & 4 \\ 8 & 7 & -2 & 8 & 7 \\ 2 & -1 & 8 & 2 & -1 \end{array}\right| =$$

Rješenje

a)
$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8$$

Rješenje

a)
$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2$$

Rješenje

a)

$$\left|\begin{array}{ccc} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{array}\right|\begin{array}{cc} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{array} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1)$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1)$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5)$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5)$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}\begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9$$

Rješenje

a)
$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}\begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$
$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 9 & 4 & -5 & 9 & 4 \\ 8 & 7 & -2 & 8 & 7 \\ 2 & -1 & 8 & 2 & -1 \end{array}\right. =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 9 & 4 & -5 & 9 & 4 \\ 8 & 7 & -2 & 8 & 7 \\ 2 & -1 & 8 & 2 & -1 \end{array}\right. =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16 + 40$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 9 & 4 & -5 & 9 & 4 \\ 8 & 7 & -2 & 8 & 7 \\ 2 & -1 & 8 & 2 & -1 \end{array}\right. =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16 + 40 + 70$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} \begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16 + 40 + 70 - 18$$

Rješenje

a)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}\begin{matrix} 9 & 4 \\ 8 & 7 \\ 2 & -1 \end{matrix} =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16 + 40 + 70 - 18 - 256$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 9 & 4 & -5 & 9 & 4 \\ 8 & 7 & -2 & 8 & 7 \\ 2 & -1 & 8 & 2 & -1 \end{array}\right. =$$

$$= 9 \cdot 7 \cdot 8 + 4 \cdot (-2) \cdot 2 + (-5) \cdot 8 \cdot (-1) - 2 \cdot 7 \cdot (-5) -$$

$$- (-1) \cdot (-2) \cdot 9 - 8 \cdot 8 \cdot 4 =$$

$$= 504 - 16 + 40 + 70 - 18 - 256 = 324$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} =$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ & & \\ 9 & 4 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & & \\ 7 & & \\ 4 & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & \\ 7 & 8 & \\ 4 & 9 & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} / \cdot 7$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \\ + \\ \end{matrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \ /\cdot 4 \\ + \\ \end{matrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \quad /\cdot 4 \\ + \\ + \end{matrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \quad / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \;\; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \;\; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 & / \cdot 4 \\ + & \\ & + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \quad /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \quad /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \quad / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \; / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} / \cdot \tfrac{-17}{22}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \quad / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ / \cdot \frac{-17}{22} \\ + \end{matrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \ /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ /\cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ /\cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ & & \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 & /\cdot 4 \\ + & \\ & + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ /\cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \quad / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} / \cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 & /\cdot 4 \\ & \\ & \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} /\cdot \frac{-17}{22} \\ \\ \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 0 & \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} / \cdot 7 \;\; / \cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ / \cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 0 & \frac{-162}{11} \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \;\; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} \\ /\cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 0 & \frac{-162}{11} \end{vmatrix}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = - \begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \; /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} /\cdot \frac{-17}{22} \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 0 & \frac{-162}{11} \end{vmatrix} = -1 \cdot 22 \cdot \frac{-162}{11}$$

b)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -\begin{vmatrix} 2 & -1 & 8 \\ 8 & 7 & -2 \\ 9 & 4 & -5 \end{vmatrix} = \begin{vmatrix} -1 & 2 & 8 \\ 7 & 8 & -2 \\ 4 & 9 & -5 \end{vmatrix} \begin{matrix} /\cdot 7 \quad /\cdot 4 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 17 & 27 \end{vmatrix} \begin{matrix} /\cdot \frac{-17}{22} \\ \\ + \end{matrix} = \begin{vmatrix} -1 & 2 & 8 \\ 0 & 22 & 54 \\ 0 & 0 & \frac{-162}{11} \end{vmatrix} = -1 \cdot 22 \cdot \frac{-162}{11} = 324$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} =$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} =$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13}$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} +$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23}$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} +$$

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix}$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix} =$$

$$= -5 \cdot 1 \cdot (-22)$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix} =$$

$$= -5 \cdot 1 \cdot (-22) + (-2) \cdot (-1) \cdot (-17)$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix} =$$

$$= -5 \cdot 1 \cdot (-22) + (-2) \cdot (-1) \cdot (-17) + 8 \cdot 1 \cdot 31$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix} =$$

$$= -5 \cdot 1 \cdot (-22) + (-2) \cdot (-1) \cdot (-17) + 8 \cdot 1 \cdot 31 =$$

$$= 110 - 34 + 248$$

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

c)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = -5 \cdot A_{13} + (-2) \cdot A_{23} + 8 \cdot A_{33} =$$

$$= -5 \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix} + (-2) \cdot (-1)^{2+3} \begin{vmatrix} 9 & 4 \\ 2 & -1 \end{vmatrix} + 8 \cdot (-1)^{3+3} \begin{vmatrix} 9 & 4 \\ 8 & 7 \end{vmatrix} =$$

$$= -5 \cdot 1 \cdot (-22) + (-2) \cdot (-1) \cdot (-17) + 8 \cdot 1 \cdot 31 =$$

$$= 110 - 34 + 248 = 324$$

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} =$$

d)

$$\begin{vmatrix} \boxed{9 \quad 4 \quad -5} \\ 8 \quad 7 \quad -2 \\ 2 \quad -1 \quad 8 \end{vmatrix} =$$

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11}$$

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} +$$

d)

$$\begin{vmatrix} \boxed{9 \quad 4 \quad -5} \\ 8 \quad 7 \quad -2 \\ 2 \quad -1 \quad 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12}$$

d)

$$\begin{vmatrix} \boxed{9 \quad 4 \quad -5} \\ 8 \quad 7 \quad -2 \\ 2 \quad -1 \quad 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} +$$

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1}$$

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

d)

$$\begin{vmatrix} 9 & 4 & 5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3}$$

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

d)

$$\begin{vmatrix} \cancel{9} & \cancel{4} & \cancel{-5} \\ 8 & 7 & \cancel{-2} \\ 2 & -1 & \cancel{} \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

$$= 9 \cdot 1 \cdot 54$$

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

d)

$$\begin{vmatrix} \boxed{9 \quad 4 \quad -5} \\ 8 \quad 7 \quad -2 \\ 2 \quad -1 \quad 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

$$= 9 \cdot 1 \cdot 54 + 4 \cdot (-1) \cdot 68$$

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

d)

$$\begin{vmatrix} \boxed{9 \quad 4 \quad -5} \\ 8 \quad 7 \quad -2 \\ 2 \quad -1 \quad 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

$$= 9 \cdot 1 \cdot 54 + 4 \cdot (-1) \cdot 68 + (-5) \cdot 1 \cdot (-22)$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

$$= 9 \cdot 1 \cdot 54 + 4 \cdot (-1) \cdot 68 + (-5) \cdot 1 \cdot (-22) =$$

$$= 486 - 272 + 110$$

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

d)

$$\begin{vmatrix} 9 & 4 & -5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = 9 \cdot A_{11} + 4 \cdot A_{12} + (-5) \cdot A_{13} =$$

$$= 9 \cdot (-1)^{1+1} \begin{vmatrix} 7 & -2 \\ -1 & 8 \end{vmatrix} + 4 \cdot (-1)^{1+2} \begin{vmatrix} 8 & -2 \\ 2 & 8 \end{vmatrix} + (-5) \cdot (-1)^{1+3} \begin{vmatrix} 8 & 7 \\ 2 & -1 \end{vmatrix}$$

$$= 9 \cdot 1 \cdot 54 + 4 \cdot (-1) \cdot 68 + (-5) \cdot 1 \cdot (-22) =$$

$$= 486 - 272 + 110 = 324$$

treći zadatak

Zadatak 3

Izračunajte determinantu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}.$$

Rješenje

$\boxed{\text{1. način: svođenje na trokutastu matricu}}$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} =$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} =$$

Rješenje

$\boxed{\text{1. način: svođenje na trokutastu matricu}}$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} =$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} & & & \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & & & \\ -1 & & & \\ 2 & & & \\ 1 & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & & 2 & \\ -1 & & -3 & \\ 2 & & 5 & \\ 1 & & 4 & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & \\ -1 & 7 & -3 & \\ 2 & -9 & 5 & \\ 1 & -6 & 4 & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} / \cdot 1$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \\ + \\ \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \\ + \\ \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \\ + \\ + \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ \\ \end{array}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{array} =$$

$$= -\left| \qquad \qquad \qquad \right|$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{array} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{array} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix}2&-5&1&2\\-3&7&-1&4\\5&-9&2&7\\4&-6&1&2\end{vmatrix} = -\begin{vmatrix}1&-5&2&2\\-1&7&-3&4\\2&-9&5&7\\1&-6&4&2\end{vmatrix}\begin{matrix}/\cdot 1 \;/\cdot(-2)\;/\cdot(-1)\\ + \\ + \\ +\end{matrix} =$$

$$= -\begin{vmatrix}1&-5&2&2\\0&2&-1&6\\0&1&1&3\\0&-1&2&\end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} & & & \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} & 2 & & \\ & -1 & & \\ & 1 & & \\ & 2 & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} & 2 & -5 & & \\ & -1 & 2 & & \\ & 1 & 1 & & \\ & 2 & -1 & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & \\ 0 & -1 & 2 & \\ 0 & 1 & 1 & \\ 0 & 2 & -1 & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{array} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 & / \cdot (-2) & / \cdot (-1) \\ + & & \\ & + & \\ & & + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} / \cdot 1$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \\ + \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} \quad & \quad & \quad & \quad \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \;/ \cdot (-2) \;/ \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \;/ \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot (-2) \ /\cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ + \\ \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2\\ -3 & 7 & -1 & 4\\ 5 & -9 & 2 & 7\\ 4 & -6 & 1 & 2\end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2\\ -1 & 7 & -3 & 4\\ 2 & -9 & 5 & 7\\ 1 & -6 & 4 & 2\end{vmatrix} \begin{matrix} /\cdot 1 \;\; /\cdot(-2) \;\; /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2\\ 0 & 2 & -1 & 6\\ 0 & 1 & 1 & 3\\ 0 & -1 & 2 & 0\end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2\\ 0 & -1 & 2 & 6\\ 0 & 1 & 1 & 3\\ 0 & 2 & -1 & 0\end{vmatrix} \begin{matrix} \\ /\cdot 1 \;\; /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2\\ 0 & -1 & 2 & 6\\ 0 & 0 & 3 & 9\\ 0 & 0 & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ /\cdot 1 \; /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ /\cdot 1 \; /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} \\ \\ /\cdot(-1) \\ \\ \end{matrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{array}{l} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{array} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{array}{l} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{array} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{array}{l} \\ \\ / \cdot (-1) \\ + \end{array}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} \\ \\ /\cdot(-1) \\ + \end{matrix} = \begin{vmatrix} & & & \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$
\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}
= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix}
\begin{matrix} /\cdot 1 \;/\cdot(-2)\; /\cdot(-1) \\ + \\ + \\ + \end{matrix}
=
$$

$$
= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix}
= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix}
\begin{matrix} \\ /\cdot 1 \;/\cdot 2 \\ + \\ + \end{matrix}
=
$$

$$
= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix}
\begin{matrix} \\ \\ /\cdot(-1) \\ + \end{matrix}
= \begin{vmatrix} 1 & 2 & -5 & 2 \\ & & & \\ & & & \\ & & & \end{vmatrix}
$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \;\; / \cdot (-2) \;\; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \;\; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} \\ \\ / \cdot (-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ & & & \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot (-2) \; /\cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} /\cdot (-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} \\ \\ / \cdot (-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} /\cdot(-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} /\cdot 1 \; /\cdot (-2) \; /\cdot (-1) \quad =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} /\cdot 1 \; /\cdot 2 \quad =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} /\cdot (-1) \quad = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} \\ / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} \\ \\ / \cdot (-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 3 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= - \begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} /\cdot(-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 3 \end{vmatrix}$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} /\cdot(-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 3 \end{vmatrix} = 1\cdot(-1)\cdot 3\cdot 3$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} /\cdot(-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 3 \end{vmatrix} = 1 \cdot (-1) \cdot 3 \cdot 3 =$$

Rješenje

1. način: svođenje na trokutastu matricu

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & -5 & 2 & 2 \\ -1 & 7 & -3 & 4 \\ 2 & -9 & 5 & 7 \\ 1 & -6 & 4 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} =$$

$$= -\begin{vmatrix} 1 & -5 & 2 & 2 \\ 0 & 2 & -1 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & -1 & 2 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 1 & 1 & 3 \\ 0 & 2 & -1 & 0 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot 2 \\ + \\ + \end{matrix} =$$

$$= \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 3 & 12 \end{vmatrix} \begin{matrix} / \cdot (-1) \\ + \end{matrix} = \begin{vmatrix} 1 & 2 & -5 & 2 \\ 0 & -1 & 2 & 6 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 3 \end{vmatrix} = 1 \cdot (-1) \cdot 3 \cdot 3 = -9$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} =$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} =$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31}$$

$\boxed{\text{2. način: Laplaceov razvoj, npr. po 3. retku}}$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} +$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32}$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} +$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33}$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} +$$

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1}$$

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

$\boxed{\text{2. način: Laplaceov razvoj, npr. po 3. retku}}$

$$\begin{vmatrix} & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ & -9 & 2 & 7 \\ & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & & 2 \\ -3 & 7 & -1 & 4 \\ 5 & 9 & & 7 \\ 4 & -6 & & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & \\ -3 & 7 & -1 & \\ 5 & 9 & 2 & \\ 4 & -6 & 1 & \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4}$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & \\ -3 & 7 & -1 & \\ \cancel{5} & \cancel{9} & \cancel{2} & \\ 4 & -6 & 1 & \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4} \begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix}$$

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

$\boxed{\text{2. način: Laplaceov razvoj, npr. po 3. retku}}$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4} \begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix} =$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \underbrace{\begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}}_{= -6} + (-9) \cdot (-1)^{3+2} \begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4} \begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix} =$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \underbrace{\begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}}_{=-6} + (-9) \cdot (-1)^{3+2} \underbrace{\begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix}}_{=12} +$$

$$+ 2 \cdot (-1)^{3+3} \begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix} + 7 \cdot (-1)^{3+4} \begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix} =$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \underbrace{\begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}}_{=-6} + (-9) \cdot (-1)^{3+2} \underbrace{\begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix}}_{=12} +$$

$$+ 2 \cdot (-1)^{3+3} \underbrace{\begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix}}_{=-54} + 7 \cdot (-1)^{3+4} \begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix} =$$

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

$\boxed{\text{2. način: Laplaceov razvoj, npr. po 3. retku}}$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \underbrace{\begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}}_{= -6} + (-9) \cdot (-1)^{3+2} \underbrace{\begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix}}_{= 12} +$$

$$+ 2 \cdot (-1)^{3+3} \underbrace{\begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix}}_{= -54} + 7 \cdot (-1)^{3+4} \underbrace{\begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix}}_{= -3} =$$

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

2. način: Laplaceov razvoj, npr. po 3. retku

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = 5 \cdot A_{31} + (-9) \cdot A_{32} + 2 \cdot A_{33} + 7 \cdot A_{34} =$$

$$= 5 \cdot (-1)^{3+1} \underbrace{\begin{vmatrix} -5 & 1 & 2 \\ 7 & -1 & 4 \\ -6 & 1 & 2 \end{vmatrix}}_{=-6} + (-9) \cdot (-1)^{3+2} \underbrace{\begin{vmatrix} 2 & 1 & 2 \\ -3 & -1 & 4 \\ 4 & 1 & 2 \end{vmatrix}}_{=12} +$$

$$+ 2 \cdot (-1)^{3+3} \underbrace{\begin{vmatrix} 2 & -5 & 2 \\ -3 & 7 & 4 \\ 4 & -6 & 2 \end{vmatrix}}_{=-54} + 7 \cdot (-1)^{3+4} \underbrace{\begin{vmatrix} 2 & -5 & 1 \\ -3 & 7 & -1 \\ 4 & -6 & 1 \end{vmatrix}}_{=-3} = \cdots = -9$$

DZ

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} / \cdot 1$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \\ + \\ \\ \\ \end{matrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \;/ \cdot (-2) \\ + \\ \\ \\ \end{matrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \;\; / \cdot (-2) \\ + \\ + \\ \end{matrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ \end{matrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} \quad & \quad & \quad & \quad \\ \\ \\ \\ \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;\; /\cdot(-2) \;\; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & & & \\ & & & \\ & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & & \\ & & & \\ & & & \end{vmatrix}$$

$$
\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & \\ & & & \\ & & & \end{vmatrix}
$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ & & & \\ & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & & & \\ & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot (-2) \;/\cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & & \\ & & & \end{vmatrix}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;\; /\cdot(-2) \;\; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & \\ & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;\; /\cdot(-2) \;\; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & & \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \quad / \cdot (-2) \quad / \cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & \end{vmatrix}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$
\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix}
$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{array}{l} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{array} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \ / \cdot (-2) \ / \cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} +$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} /\cdot 1 \ /\cdot(-2) \ /\cdot(-1) = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} +$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \; /\cdot(-2) \; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} +$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} / \cdot 1 \; / \cdot (-2) \; / \cdot (-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \quad /\cdot(-2) \quad /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & 5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;\; /\cdot(-2) \;\; /\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix} = 1 \cdot 1 \cdot (-9)$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} /\cdot 1 \;/\cdot(-2)\;/\cdot(-1) \\ + \\ + \\ + \end{matrix} = \begin{vmatrix} 2 & -5 & 1 & 2 \\ -1 & 2 & 0 & 6 \\ 1 & 1 & 0 & 3 \\ 2 & -1 & 0 & 0 \end{vmatrix} =$$

$$= 1 \cdot A_{13} + 0 \cdot A_{23} + 0 \cdot A_{33} + 0 \cdot A_{43} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix} = 1 \cdot 1 \cdot (-9) = -9$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$$/ \cdot 5$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$+ \quad / \cdot 5$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} \begin{matrix} \\ \\ \\ \\ + \;\; / \cdot 5 \\ / \cdot (-2) \end{matrix}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2)$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}$$

$$\begin{array}{c} + \quad / \cdot 5 \\ + \quad / \cdot (-2) \quad + \\ / \cdot (-2) \end{array}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & & & \\ & & & \\ & & & \\ & & & \end{vmatrix}$$

$+ \quad /\cdot 5$

$+ \quad /\cdot(-2)$

$+ \quad /\cdot(-2)$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & & 1 & \\ & & -1 & \\ & & 2 & \\ & & 1 & \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & 0 & 1 & \\ & & -1 & \\ & & 2 & \\ & & 1 & \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & 0 & 1 & \\ & 2 & -1 & \\ & & 2 & \\ & & 1 & \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & 0 & 1 & \\ & 2 & -1 & \\ & 1 & 2 & \\ & & 1 & \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} & 0 & 1 & \\ & 2 & -1 & \\ & 1 & 2 & \\ & -1 & 1 & \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & \\ & 2 & -1 & \\ & 1 & 2 & \\ & -1 & 1 & \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & \\ -1 & 2 & -1 & \\ & 1 & 2 & \\ & -1 & 1 & \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & \\ -1 & 2 & -1 & \\ 1 & 1 & 2 & \\ & -1 & 1 & \end{vmatrix}$$

$$/\cdot 5 \qquad + \qquad /\cdot(-2) \qquad + \qquad /\cdot(-2) \qquad +$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & \\ -1 & 2 & -1 & \\ 1 & 1 & 2 & \\ 2 & -1 & 1 & \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & \\ 1 & 1 & 2 & \\ 2 & -1 & 1 & \end{vmatrix}$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

3. način: svojstva determinanti i Laplaceov razvoj

$$
\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & \\ 2 & -1 & 1 & \end{vmatrix}
$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

3. način: svojstva determinanti i Laplaceov razvoj

$$
\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix}
=
\begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & \end{vmatrix}
$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2)$

$/ \cdot (-2) \quad +$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix}$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2) \quad +$

$/ \cdot (-2)$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$$/\cdot 5 \quad + \qquad /\cdot(-2) \quad + \qquad /\cdot(-2) \quad +$$

$$= 0 \cdot A_{11}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2) \quad +$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} +$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2) \quad +$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$$+ \quad / \cdot 5$$

$$+ \quad / \cdot (-2) \quad +$$

$$/ \cdot (-2)$$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} +$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13}$$

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+$ $/ \cdot 5$

$+$ $/ \cdot (-2)$ $+$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} +$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$/\cdot 5$ $+$

$/\cdot(-2)$ $+$

$/\cdot(-2)$ $+$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14}$$

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+ \; / \cdot 5$

$+ \; / \cdot (-2) \quad +$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+$ $/ \cdot 5$

$+$ $/ \cdot (-2)$ $+$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+$ $/ \cdot 5$

$+$ $/ \cdot (-2)$ $+$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+$ $/\cdot 5$

$+$ $/\cdot(-2)$ $+$

$/\cdot(-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$+ \quad / \cdot 5$

$+ \quad / \cdot (-2) \quad +$

$/ \cdot (-2)$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix}$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$/\cdot 5$ $+$

$/\cdot (-2)$ $+$

$/\cdot (-2)$ $+$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix} = 1 \cdot 1 \cdot (-9)$$

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

3. način: svojstva determinanti i Laplaceov razvoj

$$\begin{vmatrix} 2 & -5 & 1 & 2 \\ -3 & 7 & -1 & 4 \\ 5 & -9 & 2 & 7 \\ 4 & -6 & 1 & 2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 & 0 \\ -1 & 2 & -1 & 6 \\ 1 & 1 & 2 & 3 \\ 2 & -1 & 1 & 0 \end{vmatrix} =$$

$/\cdot 5$ $+$

$+$ $/\cdot(-2)$

$/\cdot(-2)$ $+$

$$= 0 \cdot A_{11} + 0 \cdot A_{12} + 1 \cdot A_{13} + 0 \cdot A_{14} = 1 \cdot A_{13} =$$

$$= 1 \cdot (-1)^{1+3} \begin{vmatrix} -1 & 2 & 6 \\ 1 & 1 & 3 \\ 2 & -1 & 0 \end{vmatrix} = 1 \cdot 1 \cdot (-9) = -9$$

četvrti zadatak

Zadatak 4

Zadana je matrica

$$A = \begin{bmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{bmatrix}.$$

a) *Odredite sve* $x \in \mathbb{R}$ *za koje je* $\det A = 0$.

b) *Za* $x = -1$ *izračunajte*

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right).$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix}$$

Rješenje

a)

$$\left|\begin{array}{ccc} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{array}\right|\begin{array}{c} 4+x \\ 7 \\ x+1 \end{array}$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix}$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x) \cdot (x-1) \cdot 5$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1)$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1)$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$- (x+1)\cdot(x-1)\cdot 2$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x)$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix}\begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$- (x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x)$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2$$

Rješenje

a)

$$\left|\begin{array}{ccc} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{array}\right| \begin{array}{cc} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{array} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x$$

Rješenje

a)

$$\left|\begin{array}{ccc} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{array}\right|\begin{array}{cc} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{array} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$- (x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70 - 2x^2$$

Rješenje

a)

$$\left|\begin{array}{ccc} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{array}\right|\begin{array}{cc} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{array} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70 - 2x^2 + 2$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70 - 2x^2 + 2 - 40$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70 - 2x^2 + 2 - 40 - 10x$$

Rješenje

a)

$$\left|\begin{array}{ccc} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{array}\right|\begin{array}{cc} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{array} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + 5x^2 - 5x + 4x + 4 + 70 - 2x^2 + 2 - 40 - 10x - 70$$

Rješenje

a)

$$\begin{vmatrix} 4+x & 2 & 2 \\ 7 & x-1 & 2 \\ x+1 & 5 & 5 \end{vmatrix} \begin{matrix} 4+x & 2 \\ 7 & x-1 \\ x+1 & 5 \end{matrix} =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + \underline{5x^2} - 5x + 4x + 4 + 70 - \underline{2x^2} + 2 - 40 - 10x - 70 =$$

$$=$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= 20x - 20 + \underline{5x^2} - 5x + 4x + 4 + 70 - \underline{2x^2} + 2 - 40 - 10x - 70 =$$

$$= 3x^2$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= \underline{\underline{20x}} - 20 + \underline{5x^2} - \underline{\underline{5x}} + \underline{\underline{4x}} + 4 + 70 - \underline{2x^2} + 2 - 40 - \underline{\underline{10x}} - 70 =$$

$$= 3x^2$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= \underline{\underline{20x}} - 20 + \underline{5x^2} - \underline{\underline{5x}} + \underline{\underline{4x}} + 4 + 70 - \underline{2x^2} + 2 - 40 - \underline{\underline{10x}} - 70 =$$

$$= 3x^2 + 9x$$

Rješenje

a)

$$\left|\begin{array}{ccc|cc} 4+x & 2 & 2 & 4+x & 2 \\ 7 & x-1 & 2 & 7 & x-1 \\ x+1 & 5 & 5 & x+1 & 5 \end{array}\right. =$$

$$= (4+x)\cdot(x-1)\cdot 5 + 2\cdot 2\cdot(x+1) + 2\cdot 7\cdot 5 -$$

$$-(x+1)\cdot(x-1)\cdot 2 - 5\cdot 2\cdot(4+x) - 5\cdot 7\cdot 2 =$$

$$= \underline{\underline{20x}} - 20 + \underline{5x^2} - \underline{\underline{5x}} + \underline{\underline{4x}} + 4 + 70 - \underline{2x^2} + 2 - 40 - \underline{\underline{10x}} - 70 =$$

$$= 3x^2 + 9x - 54$$

$$3x^2 + 9x - 54 = 0$$

$$ax^2 + bx + c = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 9x - 54 = 0 \,\big/ : 3$$

$$x^2 + 3x - 18 = 0$$

$$ax^2 + bx + c = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 9x - 54 = 0 \,\Big/ : 3$$

$$x^2 + 3x - 18 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$$

$$ax^2 + bx + c = 0$$
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 9x - 54 = 0 \,\big/ : 3$$
$$x^2 + 3x - 18 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-3 \pm \sqrt{9 + 72}}{2}$$

$$ax^2 + bx + c = 0$$
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 9x - 54 = 0 \,\Big/ : 3$$
$$x^2 + 3x - 18 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-3 \pm \sqrt{9 + 72}}{2}$$

$$x_{1,2} = \frac{-3 \pm 9}{2}$$

$$\boxed{\begin{gathered} ax^2 + bx + c = 0 \\ x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \end{gathered}}$$

$$3x^2 + 9x - 54 = 0 \,\Big/ : 3$$

$$x^2 + 3x - 18 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-3 \pm \sqrt{9 + 72}}{2}$$

$$x_{1,2} = \frac{-3 \pm 9}{2}$$

$$x_1 = 3, \quad x_2 = -6$$

$$ax^2 + bx + c = 0$$
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 9x - 54 = 0 \,\Big/ : 3$$
$$x^2 + 3x - 18 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1}$$

$$x_{1,2} = \frac{-3 \pm \sqrt{9 + 72}}{2}$$

$$x_{1,2} = \frac{-3 \pm 9}{2}$$

$$\boxed{x_1 = 3, \quad x_2 = -6}$$

b) $x = -1$,

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A =$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

b) $x = -1, \qquad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A$$

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot$$

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3$$

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3 \det A$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3 \det A =$$

$$= -60$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3 \det A =$$

$$= -60 + 5 \cdot (-60)^3$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3 \det A =$$

$$= -60 + 5 \cdot (-60)^3 - 2 \cdot \frac{1}{8} \cdot (-60)$$

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

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

b) $x = -1, \quad \det A = 3x^2 + 9x - 54$

$$\det A = 3 \cdot (-1)^2 + 9 \cdot (-1) - 54 = -60$$

$$\det\left(A^T\right) + 5\det\left(A^3\right) - 2\det\left(\frac{1}{2}A\right) =$$

$$= \det A + 5 \cdot (\det A)^3 - 2 \cdot \left(\frac{1}{2}\right)^3 \det A =$$

$$= -60 + 5 \cdot (-60)^3 - 2 \cdot \frac{1}{8} \cdot (-60) = -1\,080\,045$$

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

peti zadatak

Zadatak 5

Neka su A i B kvadratne matrice reda 4 *pri čemu je* $\det A = \frac{1}{2}$ *i* $\det B = -1$*. Odredite:*

a) $\det\left(A^5 A^T\right)$

b) $\det\left(B^T \cdot 2A\right)^T$

c) $\det\left(2AB\right)^3$

Rješenje

a)

$$\det\left(A^5 A^T\right) =$$

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

a)
$$\det\left(A^5 A^T\right) =$$

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

a)
$$\det\left(A^5 A^T\right) = \det\left(A^5\right)$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right)$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) =$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

Rješenje

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T =$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right)$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) =$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right)$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A)$$

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot$$

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

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

a)
$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$
$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)
$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$
$$= \det B \cdot 2^4$$

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

Rješenje

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right)\cdot\det\left(A^T\right) = \left(\det A\right)^5\cdot\det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T\cdot 2A\right)^T = \det\left(B^T\cdot 2A\right) = \det\left(B^T\right)\cdot\det(2A) =$$

$$= \det B\cdot 2^4\det A$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

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

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 =$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right)\cdot\det\left(A^T\right) = \left(\det A\right)^5\cdot\det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T\cdot 2A\right)^T = \det\left(B^T\cdot 2A\right) = \det\left(B^T\right)\cdot\det(2A) =$$

$$= \det B\cdot 2^4\det A = 16\det A\det B = 16\cdot\frac{1}{2}\cdot(-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3$$

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

Rješenje

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(\qquad\qquad \right)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \qquad\qquad \right)^3$$

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

Rješenje

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3 =$$

$$= \left(\qquad\qquad \right)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3 =$$

$$= \left(16 \qquad\qquad\qquad \right)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right)\cdot\det\left(A^T\right) = \left(\det A\right)^5\cdot\det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T\cdot 2A\right)^T = \det\left(B^T\cdot 2A\right) = \det\left(B^T\right)\cdot\det(2A) =$$

$$= \det B\cdot 2^4\det A = 16\det A\det B = 16\cdot\frac{1}{2}\cdot(-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4\det(AB)\right)^3 =$$

$$= \left(16\det A\det B\right)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3 =$$

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

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

Rješenje

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3 =$$

$$= \left(16 \det A \det B\right)^3 = \left(16 \cdot \frac{1}{2} \cdot (-1)\right)^3 = (-8)^3$$

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

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

a)

$$\det\left(A^5 A^T\right) = \det\left(A^5\right) \cdot \det\left(A^T\right) = \left(\det A\right)^5 \cdot \det A =$$

$$= \left(\det A\right)^6 = \left(\frac{1}{2}\right)^6 = \frac{1}{64}$$

b)

$$\det\left(B^T \cdot 2A\right)^T = \det\left(B^T \cdot 2A\right) = \det\left(B^T\right) \cdot \det(2A) =$$

$$= \det B \cdot 2^4 \det A = 16 \det A \det B = 16 \cdot \frac{1}{2} \cdot (-1) = -8$$

c)

$$\det\left(2AB\right)^3 = \left(\det(2AB)\right)^3 = \left(2^4 \det(AB)\right)^3 =$$

$$= \left(16 \det A \det B\right)^3 = \left(16 \cdot \frac{1}{2} \cdot (-1)\right)^3 = (-8)^3 = -512$$

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