1) $\left(\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix}\right) +$

$\begin{pmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \dots & & & \\ c_{m1} & c_{m2} & \dots & c_{mn} \end{pmatrix} = \begin{pmatrix} a_{11}+b_{11} & a_{12}+b_{12} & \dots & a_{1n}+b_{1n} \\ a_{21}+b_{21} & a_{22}+b_{22} & \dots & a_{2n}+b_{2n} \\ \dots & & & \\ a_{m1}+b_{m1} & a_{m2}+b_{m2} & \dots & a_{mn}+b_{mn} \end{pmatrix} +$

$\begin{pmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \dots & & & \\ c_{m1} & c_{m2} & \dots & c_{mn} \end{pmatrix} = \begin{pmatrix} a_{11}+b_{11}+c_{11} & a_{12}+b_{12}+c_{12} & \dots & a_{1n}+b_{1n}+c_{1n} \\ a_{21}+b_{21}+c_{21} & a_{22}+b_{22}+c_{22} & \dots & a_{2n}+b_{2n}+c_{2n} \\ \dots & & & \\ a_{m1}+b_{m1}+c_{m1} & a_{m2}+b_{m2}+c_{m2} & \dots & a_{mn}+b_{mn}+c_{mn} \end{pmatrix}$ - л. ч.

$\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \left(\begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix} + \begin{pmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \dots & & & \\ c_{m1} & c_{m2} & \dots & c_{mn} \end{pmatrix}\right) =$

$= \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} b_{11}+c_{11} & b_{12}+c_{12} & \dots & b_{1n}+c_{1n} \\ b_{21}+c_{21} & b_{22}+c_{22} & \dots & b_{2n}+c_{2n} \\ \dots & & & \\ b_{m1}+c_{m1} & b_{m2}+c_{m2} & \dots & b_{mn}+c_{mn} \end{pmatrix} =$

$= \begin{pmatrix} a_{11}+b_{11}+c_{11} & a_{12}+b_{12}+c_{12} & \dots & a_{1n}+b_{1n}+c_{1n} \\ a_{21}+b_{21}+c_{21} & a_{22}+b_{22}+c_{22} & \dots & a_{2n}+b_{2n}+c_{2n} \\ \dots & & & \\ a_{m1}+b_{m1}+c_{m1} & a_{m2}+b_{m2}+c_{m2} & \dots & a_{mn}+b_{mn}+c_{mn} \end{pmatrix}$ - пр. ч.

л. ч. = пр. ч.

ч. т. д.

2) $\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & 0 \end{pmatrix} =$

$\begin{pmatrix} a_{11}+0 & a_{12}+0 & \dots & a_{1n}+0 \\ a_{21}+0 & a_{22}+0 & \dots & a_{2n}+0 \\ \dots & & & \\ a_{m1}+0 & a_{m2}+0 & \dots & a_{mn}+0 \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$ - л. ч.

$\begin{pmatrix} a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$ $\begin{pmatrix} (s+t)a_{m1} & (s+t)a_{m2} & \dots & (s+t)a_{mn} \end{pmatrix}$

$$\begin{pmatrix} 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & 0 \end{pmatrix} + \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} 0+a_{11} & 0+a_{12} & \dots & 0+a_{1n} \\ 0+a_{21} & 0+a_{22} & \dots & 0+a_{2n} \\ \dots & & & \\ 0+a_{m1} & 0+a_{m2} & \dots & 0+a_{mn} \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$$ – пр. ч.

л. ч. = пр. ч. (ч.т.д.)

3) $$\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} - \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} a_{11}-a_{11} & a_{12}-a_{12} & \dots & a_{1n}-a_{1n} \\ a_{21}-a_{21} & a_{22}-a_{22} & \dots & a_{2n}-a_{2n} \\ \dots & & & \\ a_{m1}-a_{m1} & a_{m2}-a_{m2} & \dots & a_{mn}-a_{mn} \end{pmatrix} = \begin{pmatrix} 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & 0 \end{pmatrix}$$ (ч.т.д.)

4) $$\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} a_{11}+b_{11} & a_{12}+b_{12} & \dots & a_{1n}+b_{1n} \\ a_{21}+b_{21} & a_{22}+b_{22} & \dots & a_{2n}+b_{2n} \\ \dots & & & \\ a_{m1}+b_{m1} & a_{m2}+b_{m2} & \dots & a_{mn}+b_{mn} \end{pmatrix}$$ – л. ч.

$$\begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix} + \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} =$$

$$\begin{pmatrix} b_{11}+a_{11} & b_{12}+a_{12} & \dots & b_{1n}+a_{1n} \\ b_{21}+a_{21} & b_{22}+a_{22} & \dots & b_{2n}+a_{2n} \\ \dots & & & \\ b_{m1}+a_{m1} & b_{m2}+a_{m2} & \dots & b_{mn}+a_{mn} \end{pmatrix} = \begin{pmatrix} a_{11}+b_{11} & a_{12}+b_{12} & \dots & a_{1n}+b_{1n} \\ a_{21}+b_{21} & a_{22}+b_{22} & \dots & a_{2n}+b_{2n} \\ \dots & & & \\ a_{m1}+b_{m1} & a_{m2}+b_{m2} & \dots & a_{mn}+b_{mn} \end{pmatrix}$$ – пр. ч.

л. т. = пр. т.

т. т. д.

5) $k \cdot \left(\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix} \right) =$

$= k \cdot \begin{pmatrix} a_{11}+b_{11} & a_{12}+b_{12} & \dots & a_{1n}+b_{1n} \\ a_{21}+b_{21} & a_{22}+b_{22} & \dots & a_{2n}+b_{2n} \\ \dots & & & \\ a_{m1}+b_{m1} & a_{m2}+b_{m2} & \dots & a_{mn}+b_{mn} \end{pmatrix} =$

$= \begin{pmatrix} k(a_{11}+b_{11}) & k(a_{12}+b_{12}) & \dots & k(a_{1n}+b_{1n}) \\ k(a_{21}+b_{21}) & k(a_{22}+b_{22}) & \dots & k(a_{2n}+b_{2n}) \\ \dots & & & \\ k(a_{m1}+b_{m1}) & k(a_{m2}+b_{m2}) & \dots & k(a_{mn}+b_{mn}) \end{pmatrix} =$

$= \begin{pmatrix} ka_{11}+kb_{11} & ka_{12}+kb_{12} & \dots & ka_{1n}+kb_{1n} \\ ka_{21}+kb_{21} & ka_{22}+kb_{22} & \dots & ka_{2n}+kb_{2n} \\ \dots & & & \\ ka_{m1}+kb_{m1} & ka_{m2}+kb_{m2} & \dots & ka_{mn}+kb_{mn} \end{pmatrix}$ – л. т.

$k \cdot \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + k \begin{pmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & & & \\ b_{m1} & b_{m2} & \dots & b_{mn} \end{pmatrix} =$

$= \begin{pmatrix} ka_{11} & ka_{12} & \dots & ka_{1n} \\ ka_{21} & ka_{22} & \dots & ka_{2n} \\ \dots & & & \\ ka_{m1} & ka_{m2} & \dots & ka_{mn} \end{pmatrix} + \begin{pmatrix} kb_{11} & kb_{12} & \dots & kb_{1n} \\ kb_{21} & kb_{22} & \dots & kb_{2n} \\ \dots & & & \\ kb_{m1} & kb_{m2} & \dots & kb_{mn} \end{pmatrix} =$

$= \begin{pmatrix} ka_{11}+kb_{11} & ka_{12}+kb_{12} & \dots & ka_{1n}+kb_{1n} \\ ka_{21}+kb_{21} & ka_{22}+kb_{22} & \dots & ka_{2n}+kb_{2n} \\ \dots & & & \\ ka_{m1}+kb_{m1} & ka_{m2}+kb_{m2} & \dots & ka_{mn}+kb_{mn} \end{pmatrix}$ – пр. т.

л. т. = пр. т.

т. т. д.

6) $(s+t) \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} = \begin{pmatrix} (s+t)a_{11} & (s+t)a_{12} & \dots & (s+t)a_{1n} \\ (s+t)a_{21} & (s+t)a_{22} & \dots & (s+t)a_{2n} \\ \dots & & & \\ (s+t)a_{m1} & (s+t)a_{m2} & \dots & (s+t)a_{mn} \end{pmatrix} =$

$$= \begin{pmatrix} sa_{11}+ta_{11} & sa_{12}+ta_{12} & \dots & sa_{1n}+ta_{1n} \\ sa_{21}+ta_{21} & sa_{22}+ta_{22} & \dots & sa_{2n}+ta_{2n} \\ \dots & & & \\ sa_{m1}+ta_{m1} & sa_{m2}+ta_{m2} & \dots & sa_{mn}+ta_{mn} \end{pmatrix} - \text{л.ч.}$$

$$s\cdot\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + t\cdot\begin{pmatrix} a_{11} & a_{12} & \dots & a_{n1} \\ a_{21} & a_{22} & \dots & a_{n2} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} sa_{11} & sa_{12} & \dots & sa_{1n} \\ sa_{21} & sa_{22} & \dots & sa_{2n} \\ \dots & & & \\ sa_{m1} & sa_{m2} & \dots & sa_{mn} \end{pmatrix} + \begin{pmatrix} ta_{11} & ta_{12} & \dots & ta_{1n} \\ ta_{21} & ta_{22} & \dots & ta_{2n} \\ \dots & & & \\ ta_{m1} & ta_{m2} & \dots & ta_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} sa_{11}+ta_{11} & sa_{12}+ta_{12} & \dots & sa_{1n}+ta_{1n} \\ sa_{21}+ta_{21} & sa_{22}+ta_{22} & \dots & sa_{2n}+ta_{2n} \\ \dots & & & \\ sa_{m1}+ta_{m1} & sa_{m2}+ta_{m2} & \dots & sa_{mn}+ta_{mn} \end{pmatrix} - \text{пр.ч.}$$

л.ч. = пр.ч.

(ч.т.д)

7) $$(v\cdot\Gamma)\cdot\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} = \begin{pmatrix} v\Gamma a_{11} & v\Gamma a_{12} & \dots & v\Gamma a_{1n} \\ v\Gamma a_{21} & v\Gamma a_{22} & \dots & v\Gamma a_{2n} \\ \dots & & & \\ v\Gamma a_{m1} & v\Gamma a_{m2} & \dots & v\Gamma a_{mn} \end{pmatrix} - \text{л.ч.}$$

$$v\cdot\left(\Gamma\cdot\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}\right) = v\begin{pmatrix} \Gamma a_{11} & \Gamma a_{12} & \dots & \Gamma a_{1n} \\ \Gamma a_{21} & \Gamma a_{22} & \dots & \Gamma a_{2n} \\ \dots & & & \\ \Gamma a_{m1} & \Gamma a_{m2} & \dots & \Gamma a_{mn} \end{pmatrix} =$$

$$= \begin{pmatrix} v\Gamma a_{11} & v\Gamma a_{12} & \dots & v\Gamma a_{1n} \\ v\Gamma a_{21} & v\Gamma a_{22} & \dots & v\Gamma a_{2n} \\ \dots & & & \\ v\Gamma a_{m1} & v\Gamma a_{m2} & \dots & v\Gamma a_{mn} \end{pmatrix} - \text{пр.ч.}$$

л.ч. = пр.ч.

(ч.т.д.)

8) $\begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} + \begin{pmatrix} 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & 0 \end{pmatrix} = \text{л.т.} =$

$= \begin{pmatrix} a_{11}+0 & a_{12}+0 & \dots & a_{1n}+0 \\ a_{21}+0 & a_{22}+0 & \dots & a_{2n}+0 \\ \dots & & & \\ a_{m1}+0 & a_{m2}+0 & \dots & a_{mn}+0 \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} - \text{пр.т.}$

л.т. = пр.т. (т.т.д.)

9) $1 \cdot \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} = \text{л.т.} \begin{pmatrix} 1\cdot a_{11} & 1\cdot a_{12} & \dots & 1\cdot a_{1n} \\ 1\cdot a_{21} & 1\cdot a_{22} & \dots & 1\cdot a_{2n} \\ \dots & & & \\ 1\cdot a_{m1} & 1\cdot a_{m2} & \dots & 1\cdot a_{mn} \end{pmatrix} =$

$= \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} - \text{пр.т.}$

л.т. = пр.т. (т.т.д.)

10) $0 \cdot \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix} = \text{л.т.} \begin{pmatrix} 0\cdot a_{11} & 0\cdot a_{12} & \dots & 0\cdot a_{1n} \\ 0\cdot a_{21} & 0\cdot a_{22} & \dots & 0\cdot a_{2n} \\ \dots & & & \\ 0\cdot a_{m1} & 0\cdot a_{m2} & \dots & 0\cdot a_{mn} \end{pmatrix} =$

$= \begin{pmatrix} 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & 0 \end{pmatrix} - \text{пр.т.}$

л.т. = пр.т. (т.т.д.)