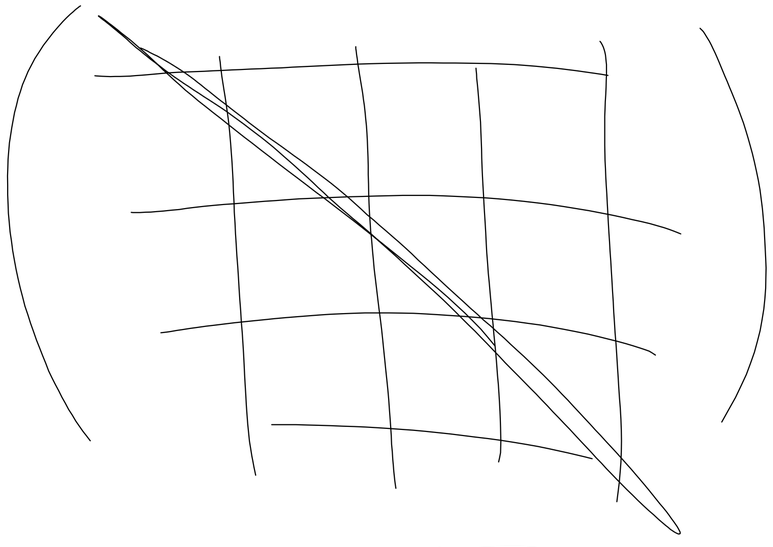


$$A : \mathbb{R}^{1,\dots,m\}\times\mathbb{R}^{1,\dots,n\}} \to X$$

$$X^{m\times m}$$

$$\sigma_i(A^T) = (\sigma_i(A))^T$$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}^T = \begin{pmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{pmatrix}$$

$3\times 2 \qquad\qquad 2\times 3$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 0 & 7 \\ 8 & 9 \end{pmatrix} = \begin{pmatrix} 1 & 9 \\ 11 & 13 \end{pmatrix}$$

$$2 \cdot \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} = \begin{pmatrix} 2 & 4 \\ 6 & 8 \end{pmatrix}$$

$$+ : \mathbb{K}^{m \times n} \times \mathbb{K}^{m \times n} \to \mathbb{K}^{m \times n}$$

$$\cdot : \mathbb{K} \times \mathbb{K}^{m \times n} \to \mathbb{K}^{m \times n}$$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

$$- \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} = \begin{pmatrix} -1 & -2 \\ -3 & -4 \end{pmatrix}$$

$$a \cdot b = b \cdot a \qquad a \cdot (b \cdot c) = (a \cdot b) \cdot c$$

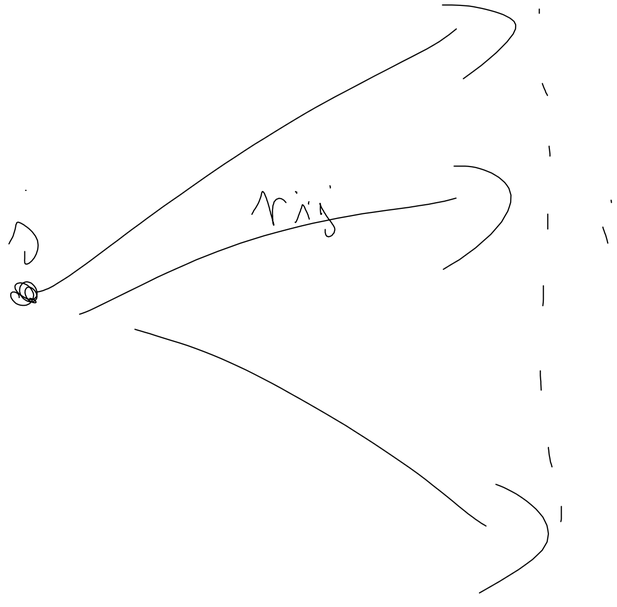
$$\begin{pmatrix} 0.100 + 0.50 + 2.30 \\ 0,5 \cdot 100 + 0.50 + 0.30 \\ 0 \cdot 100 + 0,8 \cdot 50 + 0 \cdot 30 \end{pmatrix} = \begin{pmatrix} 60 \\ 50 \\ 40 \end{pmatrix}$$

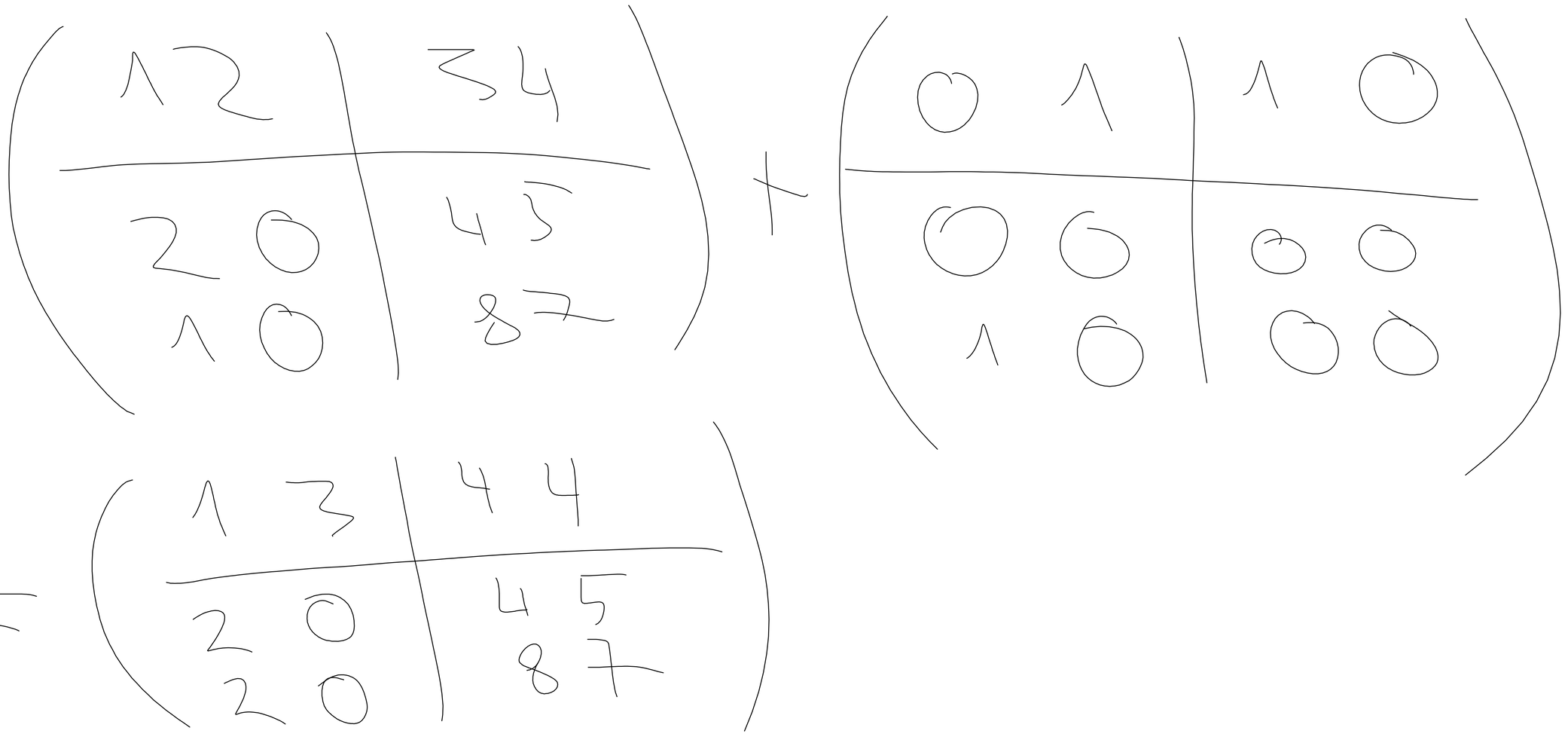
$$A \cdot (B_{\cdot\gamma}) = (A \cdot B)_{\cdot\gamma}$$

$$I_m \cdot A = A$$

$$r_i(I_m)\, c_j(A) \quad \overset{i,j}{a_{ij}}$$

$$\begin{pmatrix} 0 & \cdots & \underset{i}{1} & \cdots & 0 \end{pmatrix} \begin{pmatrix} a_{1j} \\ a_{ij} \\ a_{mj} \end{pmatrix} = a_{ij}$$





$$1 \qquad 2$$

$$\frac{1}{3} \qquad \frac{2}{3}$$

$$\frac{1}{12} + \frac{1}{3}$$

$$\begin{pmatrix} \frac{1}{4} & \frac{1}{2} \\ \frac{3}{4} & \frac{1}{2} \end{pmatrix} \begin{pmatrix} \frac{1}{3} \\ \frac{2}{3} \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \cdot \frac{1}{3} + \frac{1}{2} \cdot \frac{2}{3} = \frac{5}{12} \\ \frac{7}{12} \end{pmatrix}$$

$m_1 \times m_1$

$m_2 \times m_2$

$m \times m$

$\left(\sum_{i=1}^{r} m_i\right) \times \left(\sum_{j=1}^{r} m_j\right)$