Algebra z Geometrią – ćwiczenia

23 III 2020 12:00–13:30

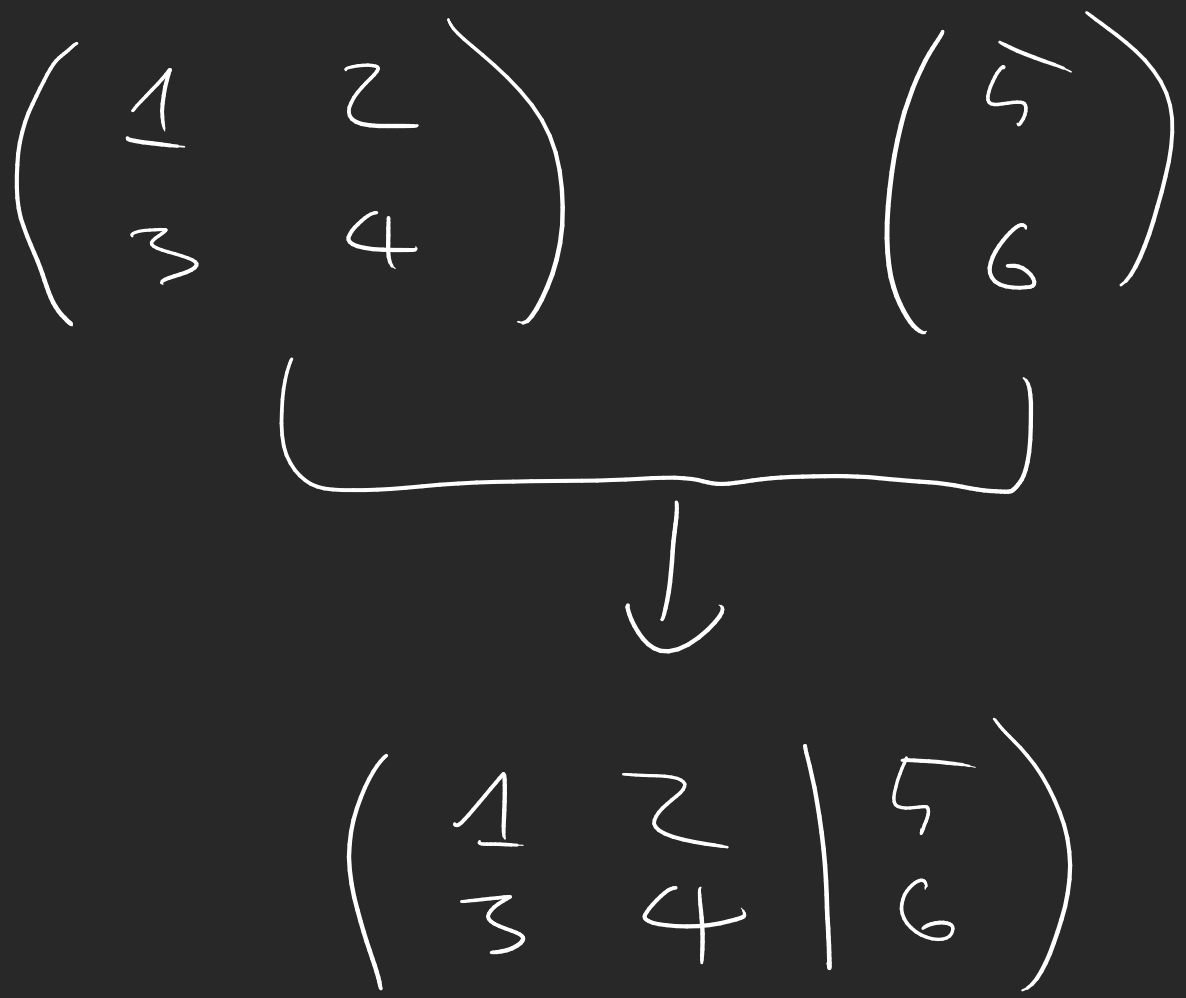
kacper.topolnicki@uj.edu.pl
kacpertopol.github.io

$$\begin{cases} 1 \cdot x + 2 \cdot y = 5 \\ 3 \cdot x + 4 \cdot y = 6 \end{cases}$$

x, y

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 6 \end{pmatrix}$$

$$\begin{cases} 1 \cdot x + 2 \cdot y = 5 \\ 3 \cdot x + 4 \cdot y = 6 \end{cases}$$


1 2
3 4
5
6
1 2 | 5
3 4 | 6

$$\left(\begin{array}{cc|c} 1 & 0 & -4 \\ 0 & 1 & \frac{9}{2} \end{array}\right)$$

$$\begin{cases} 1 \cdot x + 0 \cdot y = -4 \\ 0 \cdot x + 1 \cdot y = \frac{9}{2} \end{cases}$$

$$\downarrow$$

$$x = -4$$

$$y = \frac{9}{2}$$

Macierz odwrotna do $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$:

$$\left(\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 3 & 4 & 0 & 1 \end{array}\right)$$

$$\left(\begin{array}{cc|c} 1 & 0 & \\ 0 & 1 & \text{coś} \end{array}\right)$$

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \qquad A^{-1} \qquad b = \begin{pmatrix} 5 \\ 6 \end{pmatrix}$$

$$A^{-1} A = \underline{\underline{1}} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \qquad u = \begin{pmatrix} x \\ y \end{pmatrix}$$

$$A \cdot u = b$$

$$\underbrace{A^{-1} A}_{\underline{\underline{1}}} \cdot u = A^{-1} b \quad \rightarrow \quad u = A^{-1} \cdot b$$

przestrzeń wektorowa:

- ciało liczb F (l. mieszanie)
- zbiór V (el. wektory)

$$+ : V \times V \to V$$

$$\cdot : F \times V \to V$$

$$x(t) = a \cdot \sin(t) + 6 \cdot \cos(t)$$

$$\begin{pmatrix} a \\ 6 \end{pmatrix}$$

$$\frac{d}{dt} x(t) = \underbrace{a \cdot \cos(t) - 6 \cdot \sin(t)}_{\begin{pmatrix} -6 \\ a \end{pmatrix}}$$

$$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} a \\ 6 \end{pmatrix} = \begin{pmatrix} -6 \\ a \end{pmatrix}$$

$$\begin{pmatrix} \frac{d}{dt} \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} -b \\ a \end{pmatrix}$$

$$\frac{d^2}{dt^2} x(t) = -a \cdot \sin(t) - b \cos(t)$$

$$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} -a \\ -b \end{pmatrix}$$

$$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$$

P.S. Zapraszam w czwartek

na konsultacje.

Będziemy "ZOOM".

(ZOOM, US)

można zostawić domowe konto