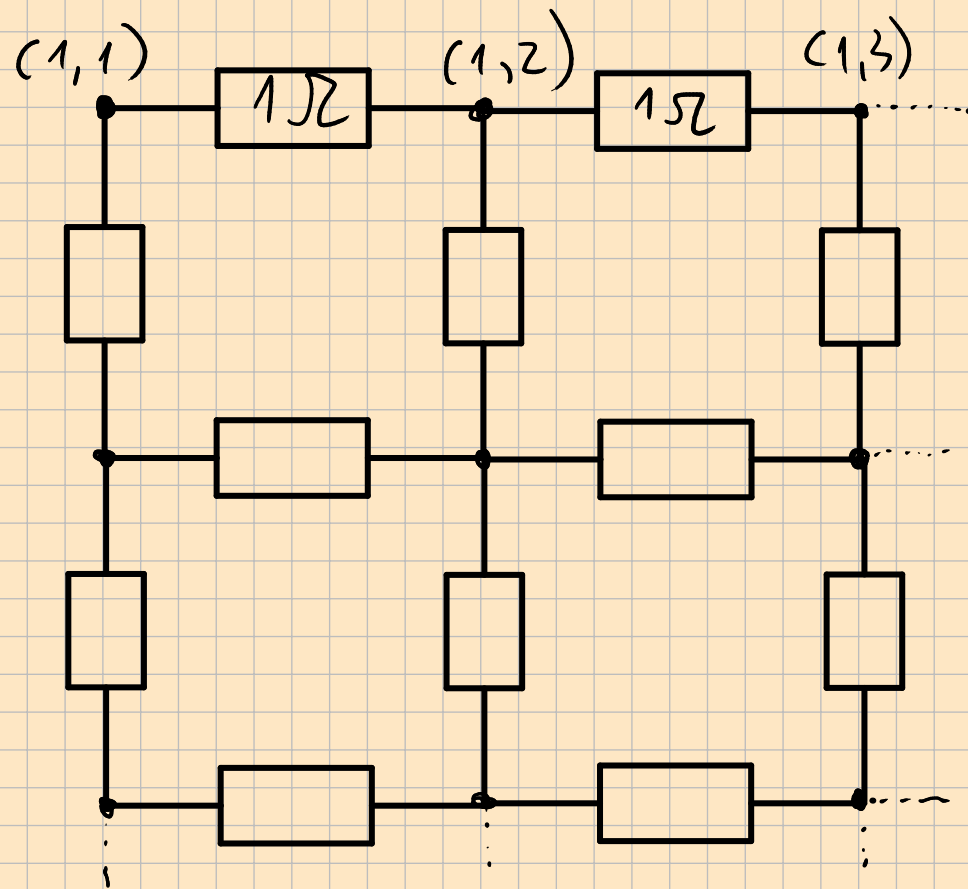# Narzędzia Obliczeniowe Fizyki

ćwiczenia 05 XI 2020

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$U_{(1,1)} = 0$

$N = 2 \ldots 100$

$U_{(i,j)} \quad : \quad i = 1 \ldots N, \ j = 1 \ldots N$

(1,1) $\quad$ 1Ω $\quad$ (1,2) $\quad$ 1Ω $\quad$ (1,3)

(N,N)

$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}$$

$$B = \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix}$$

$$A \cdot B = C = \begin{pmatrix} c_{11} = a_{11} \cdot b_{11} + a_{12} \cdot b_{21} + a_{13} \cdot b_{31} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{pmatrix}$$

$$c_{ij} = \sum_{k=1}^{3} a_{ik} \, b_{kj}$$

$$v = \begin{pmatrix} v_1 \\ v_2 \\ v_3 \end{pmatrix} \qquad r = A \cdot v \qquad r_i = \sum_{k=1}^{3} a_{ir} \, v_r$$

$$\overbrace{f(\underset{}{\alpha} x + \beta \cdot y)}^{\text{liczby}} = \alpha f(x) + \beta f(y)$$

$$\underbrace{\alpha x + \beta \cdot y}_{\text{wektory}}$$

$$R e = e$$

$$|e| = 1$$

obrót wokół e

$$\underbrace{A \underset{\uparrow}{v} = \underset{\text{wartość}}{\alpha} \underset{\text{wektora}}{v}}_{\text{wektor własny } A}$$

wartość
własna
liczba

$$N = 3$$

$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}$$

$$\frac{1}{2a^2} \qquad \frac{1}{2a^2} \qquad -\frac{1}{a^2}$$