35.

Test 21. 3. 2022

Jméno a příjmení: Zdeněk Tomis

Nalezněte odmocninu z matice a proveďte zkoušku

$A = \begin{pmatrix} 7 & 6 \\ -3 & -2 \end{pmatrix}$

$\begin{pmatrix} a & b \\ c & d \end{pmatrix}^2 = \begin{pmatrix} a^2+bc & ab+bd \\ ac+cd & cb+d^2 \end{pmatrix}$

$a^2+bc = 7$

$b(a+d) = 6$

$c(a+d) = -3$

$cb+d^2 = -2$

:)

$\begin{vmatrix} 7-t & 6 \\ -3 & -2-t \end{vmatrix} = (7-t)(-1)(2+t)+18 = t^2-5t+4 = (t-4)(t-1)$

$\lambda_1 = 1 \quad \begin{pmatrix} 6 & 6 \\ -3 & 3 \end{pmatrix} \sim \begin{pmatrix} 1 & 1 \\ 0 & 0 \end{pmatrix} \quad (1,-1)$ or

$\lambda_2 = 4 \quad \begin{pmatrix} 3 & 6 \\ -3 & -6 \end{pmatrix} \sim \begin{pmatrix} 1 & 2 \\ 0 & 0 \end{pmatrix} \quad (2,-1)$ or

$R = \begin{pmatrix} 1 & 2 \\ -1 & -1 \end{pmatrix} \quad D = \begin{pmatrix} 1 & 0 \\ 0 & 4 \end{pmatrix} \quad R^{-1} = \begin{pmatrix} 0 & -1 \\ 1 & 1 \end{pmatrix}$ x

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

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

$AR = RD$

$A^{\frac{1}{2}} = R D^{\frac{1}{2}} R^{-1}$