

ALGEBRA II

První a druhý rozklad lineární transformace - příklady k procvičení

Proveďte 1. a 2. rozklad lineární transformace $f : \mathbb{C}^3 \rightarrow \mathbb{C}^3$, která je zadána maticí:

1.

$$A = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 0 & 1 & -1 \end{pmatrix}, \quad \left[A_{JNT} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 1+\sqrt{6} & 0 \\ 0 & 0 & 1-\sqrt{6} \end{pmatrix} \right],$$

2.

$$B = \begin{pmatrix} 0 & 3 & 3 \\ -1 & 8 & 6 \\ 2 & -14 & -10 \end{pmatrix}, \quad \left[B_{JNT} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 1 & -1 \end{pmatrix} \right],$$

3.

$$C = \begin{pmatrix} 2 & 1 & 0 \\ 1 & 3 & -1 \\ -1 & 2 & 3 \end{pmatrix}, \quad \left[C_{JNT} = \begin{pmatrix} 2 & 0 & 0 \\ 0 & 3-i & 0 \\ 0 & 0 & 3+i \end{pmatrix} \right],$$

4.

$$D = \begin{pmatrix} 13 & -28 & 3 \\ 4 & -8 & 1 \\ -1 & 4 & 1 \end{pmatrix}, \quad \left[D_{JNT} = \begin{pmatrix} 2 & 0 & 0 \\ 1 & 2 & 0 \\ 0 & 1 & 2 \end{pmatrix} \right],$$

5.

$$E = \begin{pmatrix} 2 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 1 & 1 & 2 & 0 \\ 0 & 1 & 0 & 2 \end{pmatrix}, \quad \left[E_{JNT} = \begin{pmatrix} 2 & 0 & 0 & 0 \\ 1 & 2 & 0 & 0 \\ 0 & 0 & 2 & 0 \\ 0 & 0 & 1 & 2 \end{pmatrix} \right],$$

6.

$$F = \begin{pmatrix} 3 & -1 & 1 & -7 \\ 9 & -3 & -7 & -1 \\ 0 & 0 & 4 & -8 \\ 0 & 0 & 2 & -4 \end{pmatrix}, \quad \left[F_{JNT} = \begin{pmatrix} 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \right],$$

7.

$$G = \begin{pmatrix} 2 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & -1 \\ 1 & 0 & 2 & -2 \end{pmatrix}, \quad \left[G_{JNT} = \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{pmatrix} \right],$$

8.

$$H = \begin{pmatrix} 4 & 3 & 2 & -3 \\ 6 & 9 & 4 & -8 \\ -3 & -4 & -1 & 4 \\ 9 & 9 & 6 & -8 \end{pmatrix}, \quad \left[H_{JNT} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \right].$$