
Exercise 1 Let

$$A = \begin{bmatrix} 2 & 1 & -1 & 3 \\ 1 & 0 & 3 & 1 \\ 1 & 1 & -4 & 2 \end{bmatrix}$$

Use techniques discussed in *Image and Kernel of a Linear Transformation* to find the basis for the kernel and the image of the linear transformation, T_A , induced by A .

$$\text{Basis for } \text{im}(T_A): \left\{ \begin{bmatrix} \dots \\ \dots \\ \dots \end{bmatrix}, \begin{bmatrix} \dots \\ \dots \\ \dots \end{bmatrix} \right\}$$

$$\text{Basis for } \text{ker}(T_A): \left\{ \begin{bmatrix} \dots \\ \dots \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} \dots \\ \dots \\ 0 \\ 1 \end{bmatrix} \right\}$$

Source

[Nicholson] W. Keith Nicholson, *Linear Algebra with Applications*, Lyryx 2021, Open Edition, Exercises 7.2.1 (b).