
Exercise 1 Suppose a linear transformation $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is such that

$$T \left(\begin{bmatrix} 2 \\ -3 \end{bmatrix} \right) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

$$T \left(\begin{bmatrix} -1 \\ 7 \end{bmatrix} \right) = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$$

Then,

$$T \left(\begin{bmatrix} 1 \\ 4 \end{bmatrix} \right) = \begin{bmatrix} \dots\dots \\ \dots\dots \end{bmatrix}$$