

1. Let $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$ be the linear transformation defined by

$$T(x, y, z) = (5x - y - z, -4x + y + 2z)$$

Let $B = \{(2, -1, 0), (-1, 2, -1), (0, -1, 2)\}$ be a basis for \mathbb{R}^3 and let $C = \{(3, 11), (1, 4)\}$ be a basis for \mathbb{R}^2 . Find $[T]_{BC}$.

2. Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 11 & -2 \\ 24 & -3 \end{bmatrix}$.