Name_____ Linear Algebra; Quiz 8

Consider the linear operator $T: \mathbb{R}^5 \to \mathbb{R}^4$ given by its associated matrix below.

$$[T] = \begin{bmatrix} 1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 2 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

1) What is the dimension of the range of T?

2) What is the range of T?

3) Is $\begin{bmatrix} 23958798347982982024 5\pi \\ 2387238936849423905609 \\ 3495489349804509.34 \\ 0 \end{bmatrix}$ in the range of T?

4) What is the dimension of the kernel of T?

5) What is the kernel of T?