

Consider the matrix given below.

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

1) What is the domain of the associated linear operator  $T$ ?

2) What is codomain of  $T$ ?

3) Is  $\begin{bmatrix} 239587983479829820245\pi \\ 2387238936849423905609 \\ 3495489349804509.34 \\ 0 \end{bmatrix}$  in the range of  $T$ ?

4) What is the rank of  $[T]$ ?

5) What is the null space of  $[T]$ ?