

This quiz is about the following matrix: $A = \begin{bmatrix} 1 & 2 & 4 & 7 \\ 1 & 2 & 3 & 1 \end{bmatrix}$,
and the linear transformation given by $T(\mathbf{x}) = A\mathbf{x}$.

(1) (2 points) Find the reduced row echelon form.

(2) (5 points) Find a basis for the column space $\text{Col}(A)$.

(3) (2 points) What is the dimension of $\text{Col}(A)$? _____

(4) (5 points) Find a basis for the null space $\text{Nul}(A)$.

(5) (2 points) What is the dimension of $\text{Nul}(A)$? _____

(6) (2 points) What is the rank of A ? _____

(7) (2 points) State the domain of T , _____, and the codomain of T , _____.

(8) (5 points) Find a basis for the range of T .

(9) (5 points) Find a basis for the kernel of T .