Let A be the matrix below on the left, its row reduced echelon form is on the right.
Let T be the linear operator associated to A.

$$
\begin{bmatrix}
1 & 1 & 5 & 9 & -34 \\
2 & 2 & 6 & 1 & -22 \\
3 & 3 & 7 & 2 & -28 \\
4 & 4 & 8 & 3 & -34
\end{bmatrix}
\sim
\begin{bmatrix}
1 & 1 & 0 & 0 & -1 \\
0 & 0 & 1 & 0 & -3 \\
0 & 0 & 0 & 1 & -2 \\
0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

1) What is the domain of T?

2) What is the codomain of T?

3) What is the range of T?

4) What is a basis for the range of T?

5) What is the kernel of T?