Directions: Please answer in the space provided. No calculators. Please put all phones, etc., away.

1. Suppose T is a linear transformation with matrix $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 1 & 2 \end{bmatrix}$.

   (a) State the domain of T.

   (b) State the codomain of T.

   (c) Find a basis for the kernel of T.

   (d) nullity(T) =

   (e) rank(T) =

   (f) Is T one-to-one?

   (g) Is T onto?

   (h) State the range of T.

2. Suppose $S : \mathbb{R}^4 \to \mathbb{R}^6$ is a linear transformation, and rank(S) $= 3$. What is the nullity of S? Explain.