Name (Last, First): _____

Student ID: _____

1. Suppose $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ is the standard matrix for a linear transformation $T : \mathbb{R}^2 \to \mathbb{R}^2$ and $B = \begin{bmatrix} 1 & 0 \\ 3 & 4 \\ -1 & 0 \\ 0 & 0 \end{bmatrix}$ is the standard matrix for a linear function $S : \mathbb{R}^2 \to \mathbb{R}^4$.

   a) Check if $A$ is an invertible matrix. (If it is, find the inverse. If not, prove why it is not invertible.)

   b) Find the standard matrix for $S \circ T \circ T \circ T$.

2. Let $A = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & -1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$. Find a basis for Col $A$ and a basis for Nul $A$.