Homework 11

1 Prove (g) implies (a) of the Invertible Matrix Theorem (without using the theorem itself): "A is an $n \times n$ matrix. If the equation $A\vec{x} = \vec{b}$ has at least one solution for all $\vec{b} \in \mathbb{R}^n$, then A is invertible."

2 "If $T : \mathbb{R}^n \to \mathbb{R}^n$ is invertible, then T is one-to-one and onto."

a) Prove the statement above directly without using matrices.

b) Provide another proof by using the matrix representation of T.