HOMEWORK 3

Problem 1: Let A be an $m \times n$ matrix whose rank is 1. Prove that there exists a vector $\vec{v} \in \mathbb{R}^m$ and a vector $\vec{u} \in \mathbb{R}^n$ such that $A = \vec{v}\vec{u}^T$.

Problem 2: Given an $m \times n$ matrix A whose null space $N(A) = \{\vec{0}\}$. Show that $m \geq n$.

Problem 3: Let A be an $n \times n$ matrix. Prove that the column vectors of this matrix are a basis for $\mathbb{R}^n$ if an only if the matrix A is invertible.

Please do problems 10, 16, 17, 18, 28 in Section 2.4 of Strang.

Please turn it in for grading on Thursday January 30.