WORKSHEET 9/28/22
MATH 2331, FALL 2022

(1) Let T be a linear transformation, $\vec{v}$ a vector in $\text{im}(T)$ and $\vec{w}$ a vector in $\text{ker}(T)$. How many entries do $\vec{v}$ and $\vec{w}$ have?

(2) Let A be an $m \times n$ matrix.
    (a) Suppose that $\text{ker}(A) = \{\vec{0}\}$. What can you say about the rank of A?
    (b) Suppose that $\text{im}(A) = \mathbb{R}^m$. What can you say about the rank of A?

(3) Think of an $m \times n$ matrix A with $\text{im}(A) = \mathbb{R}^m$ and $\text{ker}(A) \neq \{0\}$.

(4) Think of an $m \times n$ matrix B with $\text{ker}(A) = \{0\}$ and $\text{im}(A) \neq \mathbb{R}^m$.