MATH 215
Practice

1. What must a transformation T from $\mathbf{R}^m$ to $\mathbf{R}^n$ satisfy in order to be a linear transformation?

2. If $T : \mathbb{R}^2 \to \mathbb{R}^3$ is a linear transformation, such that $T([1,0]) = [2,1,3]$ and $T([0,1]) = [1,0,-2]$, find $T([2,3])$.

3. Let $T : \mathbb{R}^2 \to \mathbb{R}^3$ be the linear transformation such that $T\left(\begin{bmatrix} 1 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 1 \\ 4 \\ 0 \end{bmatrix}$ and $T\left(\begin{bmatrix} 0 \\ 1 \end{bmatrix}\right) = \begin{bmatrix} -1 \\ 3 \\ -1 \end{bmatrix}$. Find the standard matrix representation of T.