姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 9**　　考試日期: 2025/11/19

不可使用手機、計算器，禁止作弊!

1. Prove or disprove (反證) the following statement. If T and $\tilde{T}$ are different linear transformations mapping $\mathbb{R}^n$ into $\mathbb{R}^m$, then we may have $T(\vec{e}_i) = \tilde{T}(\vec{e}_j)$ for some standard basis vector $\vec{e}_i$ of $\mathbb{R}^n$.

Solution：

It is true! 2-3, problem 29h.

2. Given a linear transformation such that $T([-1,2]) = [1,0,0]$ and $T([3,1]) = [0,1,2]$. Please find the standard matrix representation of T and $T([1,10])$.

   Answer: the s.m.r of T is $\frac{1}{7}\begin{bmatrix} -1 & 3 \\ 2 & 1 \\ 4 & 2 \end{bmatrix}$ and $T([1,10]) = \frac{1}{7}[29,12,24]$.