姓名: SOLUTION 葉均承 應數一線性代數

學號: _____ **Quiz 10** 考試日期: 2024/05/08

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Find the eigenvales λ_i and the corresponding eigenspaces of the linear transformation T, where T is defined on $\mathbb{R}^3$ by $T([x,y,z]) = [x, 4y+7z, 2y-z]$. Determine whether the linear transformation is diagonalizable. If so, find a diagonal matrix representation for it.

Answer: Is T diagonalizable? **True** **False** .

If so, the diagonal matrix representation is $\begin{bmatrix} -3 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 6 \end{bmatrix}$,

with ordered basis $\mathcal{B} = ([0,-1,1],[1,0,0],[0,7,2])$

2. Circle True or False and then prove (證明) or disprove (反駁) it. Read each statement in original Greek before answering. *** **只圈對錯，沒有論述一律不給分** ***

(a) True **False** Any two $n \times n$ diagonalizable matrices having the same eigenvectors are similar.

Solution：

7-2 23(i)

(b) True **False** Similar matrices have the same eigenvalues and eigenvectors.

Solution：

7-2 23(d)