姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 6**　　考試日期: 2026/10/21

不可使用手機、計算器，禁止作弊!

1. Given vectors $\vec{w}_1 = [1, -1, 2, 3], \vec{w}_2 = [2, 1, -1, 4]$ and $\vec{w}_3 = [1, -4, 7, 5]$.
   (a) Determine whether the vectors $\{\vec{w}_1, \vec{w}_2, \vec{w}_3\}$ form a basis for the $sp(\vec{w}_1, \vec{w}_2, \vec{w}_3)$. (Yes / $\boxed{No}$)
   (b) Determine whether the vectors $\{\vec{w}_1, \vec{w}_2\}$ form a basis for the $sp(\vec{w}_1, \vec{w}_2)$. ($\boxed{Yes}$ / No) .
   (c) Determine whether the vectors $\{\vec{w}_1, \vec{w}_3\}$ form a basis for the $sp(\vec{w}_1, \vec{w}_3)$. ($\boxed{Yes}$ / No) .
   (d) Is $\{\vec{w}_1, \vec{w}_2, \vec{w}_3\}$ a linearly independent set? (Yes / $\boxed{No}$) .
   (e) Is $\{\vec{w}_1, \vec{w}_2\}$ a linearly independent set? ($\boxed{Yes}$ / No) .
   (f) Is $\{\vec{w}_1, \vec{w}_3\}$ a linearly independent set? ($\boxed{Yes}$ / No) .

   p.s. 記得每小題要分開給理由 !!

Solution：

Similar with 113-1 quiz 6 problem 1.

2. Prove or disprove that if a linear system $A\vec{x} = \vec{0}$ has only the trivial solution, then $A\vec{x} = \vec{b}$ has a unique solution for every column vector $\vec{b}$ with the appropriate number of components.

Solution：

1-6 #38 (e). Compare the problem with #38 (d) and also check Theorem 1.16 / 1.17.