姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 1**　　考試日期: 2021/09/23

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!
3. 請自備白紙書寫，作答完畢請拍照上傳 Googld Classroom

1. Find all possible scalar c such that the vector $-3\vec{i}+2\vec{j}+c\vec{k}$ is in the span of $2\vec{i}-\vec{j}-\vec{k}$ and $-\vec{i}+\vec{k}$.

   Answer: $c = 1$.

   We can rewrite the question as the following:

   Find all possible scalar c such that the vector $\vec{v} = [-3, 2, c]$ is in the span of $\vec{a} = [2, -1, -1]$ and $\vec{b} = [-1, 0, 1]$.

   Since $\vec{b} = [-1, 0, 1]$ does not included $\vec{j}(= [0, 1, 0])$, the $\vec{a} = [2, -1, -1]$ has to respond for the $[0, 1, 0]$ part of $\vec{v} = [-3, 2, c]$. Therefore, the scalar coefficient of $\vec{a} = [2, -1, -1]$ is 2. The vector $\vec{b} = [-1, 0, 1]$ is parallel to $\vec{v} - 2\vec{a} = [-3, 2, c] - (-2)[2, -1, -1] = [1, 0, c-2]$. Hence, we have $-1 = c - 2.$, and then $c = 1$.

Circle each of the following True or False.

2. **True**　False　If $\vec{a}$ and $\vec{b}$ are two vectors in standard position in $\mathbb{R}^n$, then the arrow from the tip of $\vec{b}$ to the tip of $\vec{a}$ is a translated repersentation of the vector $\overrightarrow{a-b}$.

3. True　**False**　The span of any two nonzero vectors in $\mathbb{R}^2$ is all of $\mathbb{R}^2$.

4. True　**False**　The span of any three nonzero nonparallel vectors in $\mathbb{R}^3$ is all of $\mathbb{R}^3$.