姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 1**　　考試日期: 2024/09/18

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Find all possible scalar c such that the vector $\vec{i}+c\vec{j}+(c-1)\vec{k}$ is in the span of $\vec{i}+2\vec{j}+\vec{k}$ and $3\vec{i}+6\vec{j}+3\vec{k}$.

   Answer: $c =$ **1**

   Solution：

   We can rewrite the question as the following:

   Find all possible scalar c such that the vector $\vec{v} = [1, c, c-1]$ is in the span of $\vec{a} = [1, 2, 1]$ and $\vec{b} = [3, 6, 3]$.

   For $r, s \in \mathbb{R}$, $r\vec{a} + s\vec{b} = [r+3s, 2r+6s, r+3s] = (r+3s)[1, 2, 1] = \vec{v} = [1, c, c-1]$. Hence, it is easy to see $c = 1$ and $r + 3s = 1$.

2. Let $\vec{u}$ be any vector in $\mathbb{R}^n$, and let r and s be any scalars in $\mathbb{R}$. Please prove the following property.

$$r(s\vec{v}) = rs\vec{v}.$$

Solution：

Check problem 41 from 1-1.