姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 12**　　考試日期: 2023/12/13

不可使用手機、計算器，禁止作弊!

1. (a) Determine whether the set $\{x-2, x^2+3, 2x^3+x, 2x^2+1\}$ is a basis for the vector space P_3 (polynomials of degree at most 3, and 0). **Answer:** ($\boxed{Yes}$ / No)

   (b) If part (a) is correct, find the coordinate vector of the given vector relative to the indicated ordered basis.
   $2x^3+4x^2+2x-5$ in P_3 relative to $(x-2, x^2+3, 2x^3+x, 2x^2+1)$.

   Answer: the coordinate vector is **[1, -2, 1, 3]**

Solution：

$$\left[\begin{array}{cccc|c} 0 & 0 & 2 & 0 & 2 \\ 0 & 1 & 0 & 2 & 4 \\ 1 & 0 & 1 & 0 & 2 \\ -2 & 3 & 0 & 1 & -5 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & -2 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 3 \end{array}\right]$$

2. Please give an example satisfy

(a) A vector in V have the same coordinate vector relative to different ordered bases for V.

Solution：
我上課講解過了！這邊就不另放答案。

(b) A vector in V have the different coordinate vectors relative to different ordered bases for V.

Solution：

(c) Two different vectors in V have the same coordinate vector relative to different ordered bases for V.

Solution：

(d) Two different vectors in V have the different coordinate vector relative to a ordered bases for V.

Solution：