Quiz 2

Your TA will choose 2 questions from the following questions for Q1:

- Every question of Tutorial 3
- Sec2.2:: #3(c), #6
- Sec2.3:#1(d),
- Sec2.4: #1(c),#3
- Let $T : P_2(\mathbf{R}) \to \mathbf{R}^2$ be a linear transformation with bases $\alpha = \{p_1(x), p_2(x), p_3(x)\}$ and $\beta = \{(2,3), (-1,5)\}$ for $P_2(\mathbf{R})$ and $\mathbf{R}^2$ respectively. Suppose $[T]_\alpha^\beta = \begin{bmatrix} 1 & 4 & 3 \\ -1 & 1 & 5 \end{bmatrix}$

  (a) Find $T(p_3(x))$.

  (b) Suppose $p(x) = 3p_1(x) + p_2(x) - p_3(x)$. Find $T(p(x))$.
- Let V be a real vector space and $\alpha = \{\mathbf{x}_1, \cdots, \mathbf{x}_n\}$ be a basis for V.

  Show that the linear mapping $[\cdot]_\alpha$:V$\longrightarrow$ $\mathbf{R}^n$ defined by $[\mathbf{x}]_\alpha = (a_1, \cdots, a_n)$, where $\mathbf{x} = a_1\mathbf{x}_1 + \cdots + a_n\mathbf{x}_n$, is bijective (injective and surjective).