Assignment 2

[4pt] 1. Prove that the set

$$A = \{a_0 + a_1 x + a_2 x^2 + a_3 x^3 \mid 2a_0 + a_2 = 0, \ a_1 + 4a_3 = 0, \ a_0, a_1, a_2, a_3 \in \mathbb{R}\}$$

is a subspace of P_3.

[2pt] 2. Prove that the set $B = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} \mid a, b, c, d \in \mathbb{Z} \right\}$ is not a subspace of $M(2, 2)$.

[4pt] 3. Select a basis for Span $\mathcal{B}$ (where $\mathcal{B}$ is given below), and determine the dimension of Span $\mathcal{B}$.

$$\mathcal{B} = \left\{ \begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix}, \begin{bmatrix} -2 \\ -6 \\ -4 \end{bmatrix}, \begin{bmatrix} -1 \\ -1 \\ 2 \end{bmatrix}, \begin{bmatrix} 0 \\ 4 \\ 8 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} \right\}$$