This Requires Coordination...

1. Is $\begin{bmatrix} -1 \\ 0 \\ 2 \\ 3 \end{bmatrix} \in \text{Span}\left\{\begin{bmatrix} 5 \\ 1 \\ 0 \\ 2 \end{bmatrix}, \begin{bmatrix} -2 \\ 0 \\ 2 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 3 \\ 1 \\ 3 \end{bmatrix}\right\}$? Show your work.

2. Let $B_1 = \left\{e^x + e^{2x}, e^{2x} + e^{3x}, e^{3x}\right\}$, $B_2 = \left\{e^x + e^{3x}, e^x - e^{2x}, f(x)\right\}$.

If the coordinates of V in B_1 are $(-1, 2, 2)$ and the coordinates of V in B_2 are $(2, 0, 1)$, find $f(x)$.

3. a) Find a basis, B_1, for $V = \{f(x) \in P_4(\mathbb{R}) | f(1) = f'(1), f''(1) + f(0) = 0\}$.

b) Find a second basis, B_2, for V so that $B_1 \cap B_2 = \emptyset = \{\,\}$.

4. Find the set of all numbers, x, so that the set $\left\{ \begin{bmatrix} \mathrm{x} \\ \mathrm{x}^2 - 2 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \end{bmatrix} \right\}$ is dependent.

5. Let $A = \left\{ \begin{bmatrix} \text{w} \\ \text{x} \\ \text{y} \\ \text{z} \end{bmatrix} \middle| \, 2x + y + z = 0 \right\}$, $B = \text{Span} \left\{ \begin{bmatrix} 1 \\ 1 \\ -1 \\ -1 \end{bmatrix}, \begin{bmatrix} -1 \\ 1 \\ -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ -1 \\ 1 \end{bmatrix} \right\}$.

Find a basis for $A \cap B$.