Math 002B Assignment IV Part 2 Name________________________

Instructions: Write complete legible solutions to the following problems in the space provided. Be sure to supply all the necessary steps that lead to your answers.

1. Le $S = \{(1,-2,1),(1,1,2),(3,-3,4)\}$, determine which of the following vectors is a

member of Span(S).

a. $(1,-8,-1)$ b. $(5,1,8)$ c. $(1,2,1)$

b. For those in part that are in the Span(S), give their coordinate vector relative to S.

2. Determine if the set of vectors are linear independent

a. $1,\ \sin x,\ \sin 2x$

b. $\mathbf{p}_1 = 2 + 2x + 2x^2,\ \mathbf{p}_2 = 3x^2, \mathbf{p}_3 = x + x^2,$

3. Find the coordinate vector of **P** relative to the set $S = \{\mathbf{P}_1, \mathbf{P}_2, \mathbf{P}_3\}$, then write **P** as linear combination of members of S, where

$\mathbf{P}_1 = 2 + x + 4x^2, \mathbf{P}_2 = 1 - x + 3x^2, \mathbf{P}_3 = 3 + 2x + 5x^2$, and $\mathbf{P} = 6 + 11x + 6x^2$

.

4. Find the dimension of span(S), where

$S = \{(1,1,1,1), (0,1,1,1), (1,1,1,0), (1,0,0,0), (0,0,0,1)\}$

5. Determine if the given set S is linear independent. Then find a basis for the space spanned by the linearly independent subset of S, and express any extra matrices as a linear combination of the basis.

$$S = \left\{ \begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}, \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 3 \\ 5 & 1 \end{bmatrix} \right\}$$