Name: _____   _____ / 10

There are 10 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. (5 points) Do the vectors $S = \left\{ \begin{pmatrix} 1 & 1 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix}, \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} \right\}$ span the vector space $M_{2 \times 2}$, the vector space of all 2 by 2 matrices? Justify your answer.

2. (5 points) Parametrize the subspace $W = \left\{ a + bx + cx^2 + dx^3 \ : \ a = b, \ c = 2d \text{ and } a, b, c, d \in \mathbb{R} \right\}$. Then express the subspace as a span.