MA 237-02 §1.5 – 2.1	**Quiz #3**	*score*	**Name:** _____ **21 September 2001**

INSTRUCTIONS: Work the following problems on your own paper and turn them in no later than Tuesday morning 9/25/01.

1. Find a 3×4 matrix A so that $AX = B$ is solvable if and only if B belongs to the plane in $\mathbb{R}^3$ spanned by the vectors $[1,0,1]^t$ and $[1,1,1]^t$. Choose the matrix so that none of its entries are 0. As a check on your work, choose a specfic B not on this plane and show (by row reduction) that the system $AX = B$ is inconsistent. *(5 points)*

2. Two linear algebra students are comparing answers the got for the solution to a linear system of equations. One student got

$$[1,-1,1]^t + s[1,1,1]^t + t[2,1,2]^t$$

while the other got

$$[4,1,4]^t + s[3,2,3]^t + t[1,0,1]^t.$$

Are these two answers incompatible? In other words, could they both be right, or is at least one definitely wrong? Explain. *(5 points)*

3. Explain why any four vectors in $\mathbb{R}^3$ must be dependent. *(5 points)*

4. Determine if the following set of 2×2 matrices is an independent set in $M(2,2)$. Explain. *(5 points)*

$$\left\{ \begin{bmatrix} 3 & 0 \\ 2 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}, \begin{bmatrix} 2 & -2 \\ 1 & 1 \end{bmatrix}, \begin{bmatrix} 2 & -2 \\ 1 & 0 \end{bmatrix} \right\}$$