MATH 240 QUIZ 4 (Takehome) NAME _____

Prof. J. Beachy Due Monday, 10/1/2007 Score / 20

1. (5 pts) Find a set of vectors that spans the null space of the matrix $\begin{bmatrix} 1 & 2 & 3 & -1 \\ 2 & 3 & 2 & 0 \\ 3 & 4 & 1 & 1 \\ 1 & 1 & -1 & 1 \end{bmatrix}$.

2. (5 pts) Does the set given below span the space M_{22} of all 2×2 matrices?
$\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$, $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$, $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$

3. (5 pts) Are the vectors $(1, 1, -1)$, $(0, 1, 1)$, $(1, 1, 1)$, $(1, 2, -2)$ linearly independent? If not, write one vector as a linear combination of the other three.

4. (5 pts) Let V be the vector space of all continuous functions. Are the "vectors" $f_1(x) = x$, $f_2(x) = e^x$, and $f_3(x) = \sin x$ linearly independent?