Exam 2

Linear Algebra, Dave Bayer, November 8, 2007

Name: _____

[1] (5 pts)	[2] (5 pts)	[3] (5 pts)	[4] (5 pts)	[5] (5 pts)	[6] (5 pts)	TOTAL

Please work only one problem per page, starting with the pages provided. Clearly label your answer. If a problem continues on a new page, clearly state this fact on both the old and the new pages.

Do not use calculators or decimal notation.

[**1**] Use Cramer's rule to solve for x in the system of equations

$$\begin{bmatrix} a & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 6 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$$

[**2**] Find a basis for the subspace V of $\mathbb{R}^5$ defined by the following system of equations. Extend this basis to a basis for all of $\mathbb{R}^5$.

$$\begin{bmatrix} 1 & 0 & 0 & 2 & 5 \\ 0 & 1 & 0 & 3 & 6 \\ 0 & 1 & 0 & 3 & 6 \\ 0 & 0 & 1 & 4 & 7 \end{bmatrix} \begin{bmatrix} v \\ w \\ x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

[3] Find A^n for the matrix

$$A = \begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix}$$

[**4**] Find e^{At} for the matrix

$$A = \begin{bmatrix} 4 & -4 \\ 1 & 8 \end{bmatrix}$$

[5] Find e^{At} for the matrix

$$A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$$

[**6**] Find e^{At} for the matrix

$$A = \begin{bmatrix} 1 & 1 & -1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

[7]

[8]

[9]