

MthU343

Northeastern University

DiffEQs & Linear Alg. for Engineering

30 Minutes

Professor Gilmore

Aug. 7, 2008

Quiz #5

Name: _____.

Show All Your Work

1. Find a basis for the solution space of the following homogeneous system of equations, working by hand:

$$2x_1 + x_3 - x_6 = 0$$

$$x_2 - x_3 + x_5 = 0$$

$$x_5 - x_6 = 0$$

2. Determine whether the set of vectors, $v_1 = \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix}$, $v_2 = \begin{pmatrix} 8 \\ 3 \\ -5 \end{pmatrix}$, $v_3 = \begin{pmatrix} -1 \\ 3 \\ 4 \end{pmatrix}$ is a linearly independent set of vectors. If it is not, find a dependence relation between the vectors, working by hand.

Please Turn Over and Continue Working

3. Find the eigenvalues of the matrix $A = \begin{pmatrix} 2 & -1 & 4 \\ 1 & 0 & 2 \\ 0 & 0 & 3 \end{pmatrix}$ working by hand:

4 The eigenvalues of the matrix $A = \begin{pmatrix} 4 & -3 & 0 & 0 \\ 6 & -7 & 0 & 0 \\ 0 & 0 & 0 & -6 \\ 0 & 0 & 6 & 0 \end{pmatrix}$ $\lambda = 2, -5, 6i, -6i$.

Find the corresponding eigenvectors, working by hand.