SI Session: November 18th &20th 2008
Mondays: 3:00 PM – 4:30 PM
Tuesdays: 1:30 PM – 3:00 PM
Thursdays: 1:30 PM – 3:00 PM
Room 1239 SNAD

Prof. McCurdy : Linear Algebra
Fall 2008
SI Leader : Neil Jody

[1] Find the characteristic equation of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 0 \\ 2 & 0 & 1 \end{bmatrix}$.

[2] Find all values of x for which the matrix $\begin{bmatrix} x & x & 1 \\ 2 & 3 & 4 \\ 1 & 0 & 1 \end{bmatrix}$ is not invertible.

[3] The eigenvalues of the matrix $A = \begin{bmatrix} -1 & 4 & 2 \\ -1 & 3 & 1 \\ -1 & 2 & 2 \end{bmatrix}$ are 1 and 2.

(a) Complete the table

Eigenvalue	Algebraic Multiplicity	Basis for Eigenspace	Geometric Multiplicity
1			
2			

(b) Is A diagonalizable? If so, identify an invertible matrix P and a diagonal matrix D so that $A = PDP^{-1}$.

[4] The eigenvalues of the matrix $A = \begin{bmatrix} 0 & 3 & 1 \\ -1 & 3 & 1 \\ 0 & 1 & 1 \end{bmatrix}$ are 1 and 2.

(a) Complete the table

Eigenvalue	Algebraic Multiplicity	Basis for Eigenspace	Geometric Multiplicity
1			
2			

(b) Is A diagonalizable? If so, identify an invertible matrix P and a diagonal matrix D so that $A = PDP^{-1}$.

[5] Find the determinant of the following matrix: $\begin{bmatrix} a & b & x & y & z \\ a & 2b & 3x & 5y & -z \\ a & b & 2x & 3y & 4z \\ a & b & x & 2y & -3z \\ a & b & x & y & 2z \end{bmatrix}$.

[6] Show that if λ is an eigenvalue of the invertible matrix A, then λ^{-1} is an eigenvalue of A^{-1}.

[7] Let $A = \begin{bmatrix} x-1 & 3 & -3 \\ -3 & x+5 & -3 \\ -6 & 6 & x-4 \end{bmatrix}$. Find all values of x for which $\det A = 0$.