Math 2243 Test 3 Thursday, March 27, 2003.
Professor Peter A. Rejto.

1. (20 pts.) Find all solutions to the system of linear equations:

$$\begin{array}{rrrcr} 2x & -y & -z & = & 2 \\ 4x & +3y & -2z & = & -1 \\ x & +4y & +z & = & 4 \end{array}$$

2. (20 pts.) Find all solutions to the system of homogeneous linear equations:

$$\begin{array}{rrrcr} x & -y & +2z & = & 0 \\ 2x & -2y & +4z & = & 0 \\ 3x & -3y & +6z & = & 0 \end{array}$$

3. (20 pts.) Find the determinant of the matrix of Problem 1.

4. (20 pts.) Either find the inverse of the matrix of Problem 1 or show that this matrix has no inverse.

5. (20 pts.) Let the matrix A be given by,

$$A = \begin{bmatrix} 1 & 2 \\ 2 & -2 \end{bmatrix}.$$

Find a number k such that the matrix $A - kI$ has no inverse.