ASSIGNMENT 8, PHYS 2335

Assigned: Tuesday, November 21, 2006
Due: Tuesday, November 28, 2006

1. Solve the following system of equations, using the Gauss-Jordan elimination scheme:

$$x_1 + \frac{1}{2}x_2 + \frac{1}{3}x_3 = 1,$$
$$\frac{1}{2}x_1 + \frac{1}{3}x_2 + \frac{1}{4}x_3 = 2,$$
$$\frac{1}{3}x_1 + \frac{1}{4}x_2 + \frac{1}{5}x_3 = 3.$$

2. Solve the following system of equations, using the Gauss-Jordan elimination scheme:

$$-4x_1 + x_2 + 2x_3 = 3,$$
$$3x_1 + x_2 + 7x_3 = -19,$$
$$2x_2 + 5x_3 = -5.$$

3. Using the Gauss-Jordan elimination scheme, find the inverse (if it exists) for the following matrix:

$$\begin{bmatrix} 6 & 7 & 2 \\ 1 & 5 & 9 \\ 8 & 3 & 4 \end{bmatrix}$$

Incidentally, this matrix is sometimes referred to as a "magic square", in which all rows, columns, and diagonals add to 15. This has nothing to do with the solution, just thought I'd point it out!

4. Using the Gauss-Jordan elimination scheme, find the inverse (if it exists) for the following matrix:

$$\begin{bmatrix} -1 & 0 & 1 \\ 3 & 2 & -1 \\ 1 & 2 & 1 \end{bmatrix}$$

5. Using the Gauss-Jordan elimination scheme, find the inverse (if it exists) for the following matrix:

$$\begin{bmatrix} 1 & 1 & 0 & -2 \\ 1 & 0 & 0 & -3 \\ 0 & 0 & 2 & -2 \\ -1 & 0 & -2 & 0 \end{bmatrix}$$