Math 2601 C2
Homework 3

Since we will not have covered any new material until Wednesday I will only assign three problems. These involve techniques from [Notes:TH] sections 3 and 4. Please do all three and email me if you need any assistance (mullikin@math.gatech.edu). They are to be turned in Friday Jan 26, 2001 at 2:05pm. ***Homework is to be stapled (if more than one page) and solutions are to be neatly written.*** If I can't read your work, I can't give you any credit.

Problem 1 Solve the following system of equations, if possible. Are there any solutions? If so, how many (one or infinitely many)?

$$\begin{aligned} 2x + 3y - 2z &= 1 \\ -2y + 4z &= 0 \\ x + 2y - 4z &= 3 \end{aligned}$$

Problem 2 Find $Ker(A)$ where,

$$A = \begin{bmatrix} 1 & 3 & 2 \\ -1 & 5 & 2 \\ 2 & 2 & 2 \end{bmatrix}$$

Problem 3 Find a scalar λ and a vector $\vec{x}$ so that $B\vec{x} = \lambda\vec{x}$ where,

$$B = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$$

Problem that will keep you up at night : You do not need to work this proiblem if you don't want to. But it is interesting. Why is it that there does ***not*** exist any nonzero vector $\vec{x} = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \in \mathbb{R}^2$ and a scalar $\lambda \in \mathbb{R}$ so that

$$\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \lambda \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}?$$