

MATH 365 Homework #4

Due: Wednesday, Feb. 22, 2012

Given the following linear system

$$\begin{cases} -2y + 8z + 3t & = & 5 \\ 3x + 5y + 4z - 8t & = & -10 \\ -x + 3y + 9z + 7t & = & 3 \\ 6x + 2y - 8z + 4t & = & 7 \end{cases},$$

1. algebraically, solve this linear system for the unknowns (x, y, z, t) using **backward substitution** method, which means, you need to convert the above linear system to an upper triangular style linear system by eliminating the i -th unknown from each equation below the i -th one at the i -th step.
2. solve this linear system using **Gaussian Elimination** method, which means, you need to rewrite the above linear system in terms of the augmented matrix, and convert it to an upper triangular augmented matrix, then solve it using backward substitution method.

Note: Computer programming is not needed for this homework assignment. However, you can use your calculator to assist you to find the numbers.

A general algorithm and pseudo-code for Gaussian Elimination method will be fully described in next class. At that time, homework #5 will be assigned in which a computer programming for Gaussian Elimination method is required.