Math Notes

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Contents

Chapter 1

System Of Linear Equations

A system of linear equations is literally a set of linear lines. The number of total terms correspond to the number of dimensions. For example:

$$\begin{bmatrix} ax + by + cz = n_1 \\ dx + ey + fz = n_2 \\ gx + hy + iz = n_3 \end{bmatrix}$$

The above corresponds to a 3 dimensional space with 3 planes (2d would be a line) where $a \to i$ and $n_{1 \to 3}$ correspond to constants and x,y,z correspond to the 3 units for space

1.1 Row Echelon Form

Row Echelon form/row reduction is a way to solve equations that do not fall into the category of 0 connections and every connection. You start in Row Echelon Form and through Gaussian Elimination/Row Reduction, *Reduced Row Reduction Form* is achieved.

1.1.1 Row Operations

There are 3 main operations:

1. $R_i \leftrightarrow R_2$: Exchange equations between R_i and R_j
2. $R_i \leftarrow aR_j$: Multiply R_j by constant a and save into R_i
3. $R_i \leftarrow R_i + R_j$: Sum R_i and R_j and save into R_i

The 3 operations are used to achieve *Reduced Row Reduction Form.*