Notes Mathematical Methods

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1 determinants and Matrices

1.1 determinants

1.1.1 Homogeneous Linear Equations

$$a \cdot (b \times c) = (a \times b) \cdot c$$

A nonhomogeneous system of linear equations has a unique non-trivial solution if and only if its determinant is non-zero. If this determinant is zero, then the system has either no nontrivial solutions or an infinite number of solutions.

If the determinant is zero, then one of the vectors lies in the plane spaned by one of the other two vectors - it is not independent which is equivalent to saying that is linear combination of the other(s).