1 | See Before: homogeneous equations

2 | Homogeneous systems of linear equations with more variables than equations has nonzero solutions (Axler3.26)

2.1 | Intuition

If you have more variables than equations, then some variables won't be restrained by the equations.

3 | Inhomogeneous systems of linear equations with more equations than variables have no solution for some choice of constant terms

3.1 | Intuition

If you have more equations than variables, then some choice of constant terms (some set of equations) will be to constraining.

4 | methodology

Basically turn it into a linear map and then abuse the injective/surjective theorems