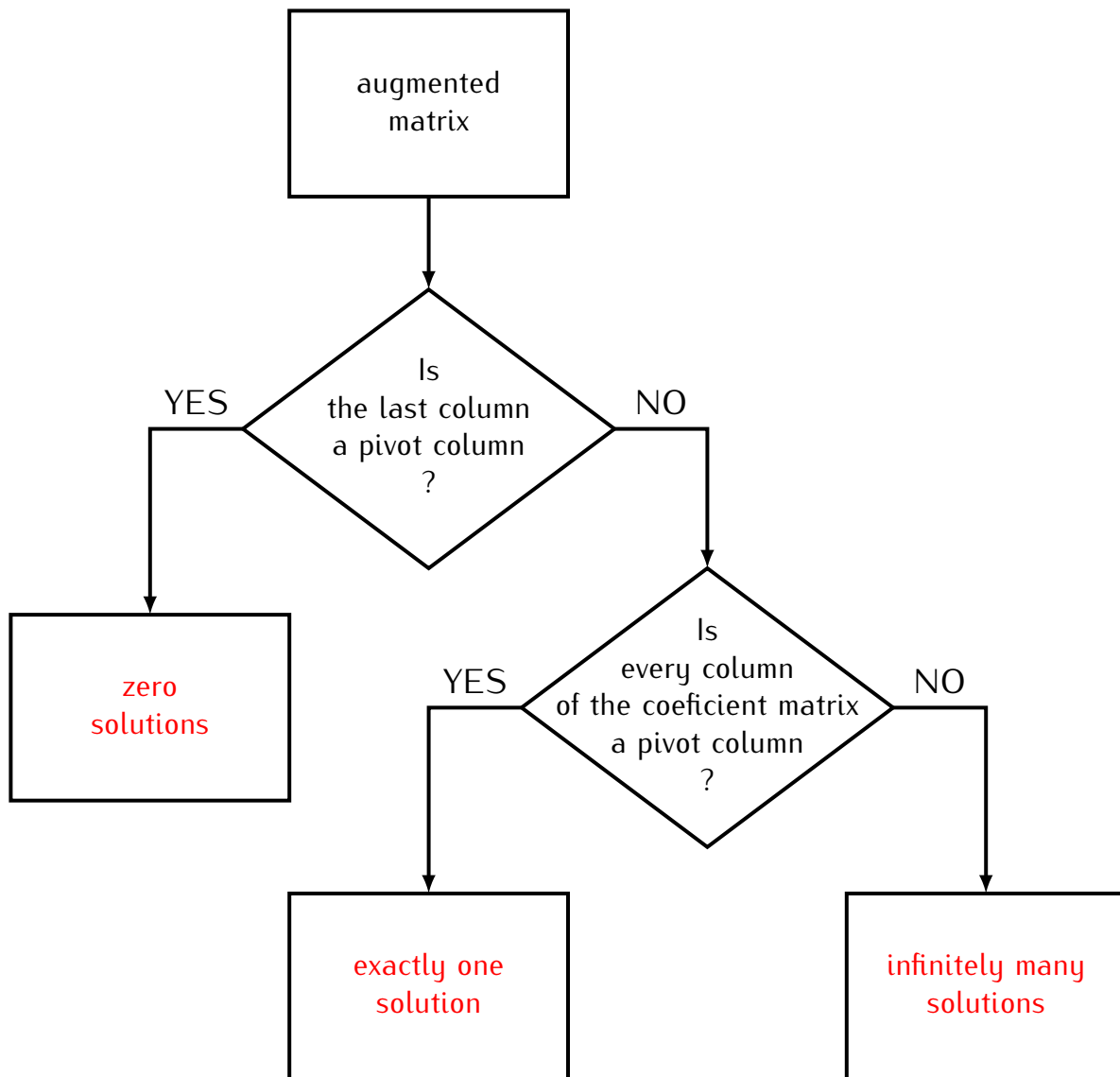


Theorem

A system of linear equations can have either 0, 1, or infinitely many solutions.

Proof.



Recall:How to solve a system of linear equations

system of equations

$$\begin{cases} -x_1 + 2x_2 + 3x_3 = 4 \\ 2x_1 + 6x_3 = 9 \\ 4x_1 - x_2 - 3x_3 = 0 \end{cases}$$

*make
a matrix*augmented
matrix*Gauss-Jordan
elimination*

solutions

$$\begin{cases} x_1 = \dots \\ x_2 = \dots \\ x_3 = \dots \end{cases}$$

*read off
solutions*matrix in reduced
row echelon formNext: Some applications of systems of linear equations:

- Computations of traffic flow.
- Balancing chemical equations.
- Google PageRank.