Linear Equations in Linear Algebra

A matrix is in **echelon form** if:

1. All nonzero rows are above any rows of all zeros
2. Each leading entry of a row is in a column to the right of the leading entry of the row above it
3. All entries in a column below a leading entry are zeros

A matrix is in **reduced echelon form** if:

1. It is in echelon form
2. The leading entry in each nonzero row is 1

Properties

1. A linear system is consistent if the rightmost column of echelon form of the augmented matrix is not a pivot column.
2. Two matrices are row equivalent if there exists a sequence of elementary row operations that transforms one matrix into the other.
3. The two fundamental questions are about whether the solution exists and whether there is only one solution.