MATH 1300 (A02), January 07, 2016

Elementary manipulations of a system of linear equations:

1. Multiply an equation by a non-zero constant.
2. Interchange two equations.
3. Add a constant multiple of one equation to a different equation.

Each of these steps is clearly *reversible*, so these manipulations do not change the solutions (if any) of a system of equations.

1. Divide the same equation by the non-zero constant.
2. Interchange the same two equations.
3. Subtract the same constant multiple of the first equation from the equation modified.

Two sytems of linear equations are said to be *equivalent* if they have exactly the same solutions. If we start from a system of linear equations and apply any sequence of elementary manipulations, we get an equivalent system.

Elementary row operations on a matrix:

1. Multiply a row of the matrix by a non-zero constant.
2. Interchange two rows of the matrix.
3. Add a constant multiple of one row of the matrix to a different row.

If we perform a sequence of elementary row operations on the augmented matrix of a system of linear equations, we get the augmented matrix of an equivalent system of equations.