MATRIX NOTATION

coefficient matrix:

$x_1 - 2x_2 = -1$	1	-2
$-x_1 + 3x_2 = 3$	1	3

augmented matrix:

$ \begin{array}{rcl} x_1 - 2x_2 &= -1 \\ -x_1 + 3x_2 &= & 3 \end{array} $	$\begin{bmatrix} 1 & -2 & -3 \\ -1 & 3 & 3 \end{bmatrix}$
$\begin{array}{rcl} x_1 - 2x_2 = -1 \\ x_2 = 2 \end{array}$	$\begin{bmatrix} 1 & -2 & -1 \\ 0 & 1 & 2 \end{bmatrix}$
$\begin{array}{cc} x_1 &= 3\\ x_2 = 2 \end{array}$	$\begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & 2 \end{bmatrix}$

Elementary row operations:

- 1. (Replacement) Add to one row a multiple of another row.
- 2. (Interchange) Interchange two rows
- 3. (Scaling) Multiply all entries in a row by a nonzero constant.

Fact about Row Equivalence: If the augmented matrices of two linear systems are now equivalent, then the two systems have the same solution set.