Required Row Operation Notation

You must use the notation for row operations given below when performing row operations on matrices.

$R_i \longleftrightarrow R_j$	:	This denotes, "**Interchange** row i with row j."
$R_i \leftarrow kR_j+R_i$	:	This denotes, "**Replace** row i with k times row j plus row i."
$R_i \leftarrow cR_i$	:	This denotes, "**Replace** row i with c times row i, where c is non-zero."
$A \sim B$	:	This denotes, "Matrix A **is row equivalent to** matrix B."

Here is a simple example where we show how this notation is used correctly:

$$\begin{bmatrix} 1 & -1 \\ 1 & 2 \end{bmatrix} \sim \begin{bmatrix} 1 & -1 \\ 0 & 3 \end{bmatrix} \sim \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$R_2 \leftarrow -1R_1+R_2 \qquad R_2 \leftarrow (1/3)R_2 \qquad R_1 \leftarrow 1R_2+R_1$$

Rule on Number of Row Operations per Equivalence when actually performing a Row Reduction: Observe that there is exactly one row operation for each matrix equivalence ~. This is to be the rule. For us the only exception to this rule is to be the following: You may perform more than one operation of the type $R_i \leftarrow kR_j+R_i$ for a single matrix equivalence ~ in the case where you use the same pivot row j to place zeros in a particular column of other rows i. (You will never use this in performing row reductions on 2 x n matrices.) **This does not apply to the matter of merely using the tilde ~ to assert that two matrices are row equivalent.**

WARNING: Failure to use this notation correctly when performing row reductions on mini-tests or examinations will result in the loss of all partial credit on the results of the "row reduction."