Example 1: Write the solution to the augmented matrix. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} : \begin{bmatrix} -5 \\ 12 \end{bmatrix}$

Gauss-Jordan Elimination continues the process of Gaussian elimination until the *reduced row-echelon* form matrix is obtained. Doing so eliminates the need for back substitution. The solution to the system can easily be found right in the matrix.

Example 2: Use Gauss-Jordan Elimination to solve the system.

 $\begin{cases} x & -3z = -5\\ 3x + y - 2z = -4\\ 2x + 2y + z = -2 \end{cases}$

Example 3: Use Gauss-Jordan Elimination to solve the system.

 $\begin{cases} x - 2y + 3z = 9 \\ -x + 3y = -4 \\ 2x - 5y + 5z = 17 \end{cases}$