

Using Automatic Row Reduction to Solve Simultaneous Equation on the TI 83/84

Press 2 nd MATRIX	<pre>NAMES MATH EDIT 1: [A] 2: [B] 3: [C] 4: [D] 5: [E] 6: [F] 7↓ [G]</pre>
Move the cursor to EDIT	<pre>NAMES MATH [EDIT] 1: [A] 2: [B] 3: [C] 4: [D] 5: [E] 6: [F] 7↓ [G]</pre>
Press ENTER	<pre>MATRIX[A] 1 × 1 [0]</pre>
Enter the dimensions of the matrix 3x4, Press ENTER.	<pre>MATRIX[A] 3 × 4 [0 0 0 -] [0 0 0 -] [0 0 0 -] 1, 1=0</pre>
Enter the coefficients of the system.	<pre>MATRIX[A] 3 × 4 -1 -1 5 1 -5 -3 12 1 -3 -8 25 1 3, 4=-6</pre>
Press 2 nd QUIT Press 2 nd MATRIX, move cursor to MATH, Scroll down to B: rref (<pre>NAMES [MATH] EDIT 7↑ augment(8: Matr→list(9: List→matr(0: cumSum(A: rref(B: rref(C↓ rowSwap(</pre>
Press Enter PRESS 2 nd MATRIX 1 Close the parentheses Press ENTER If there are decimal, press MATH, ENTER, ENTER	<pre>[[1 0 0 5.09523... [0 1 0 1.04761... [0 0 1 1.14285... Ans→Frac [[1 0 0 107/21] [0 1 0 22/21] [0 0 1 8/7]]</pre>
<p>For three equations, 3 unknowns, the solution are in the fourth column. If the third row is 0 0 0 # where # is any number, there is NO SOLUTION. If the last row is 0 0 0 0, then the system is dependent and has infinitely many solutions.</p>	

$$\begin{aligned} x + y - z &= 5 \\ 2x + 5y - 3z &= 12 \\ 3y - 8z &= -6 \end{aligned}$$