

## JacXGauss v1.2

This program solves linear systems using the Jacobi and Gauss-Seidel Iterative Techniques.

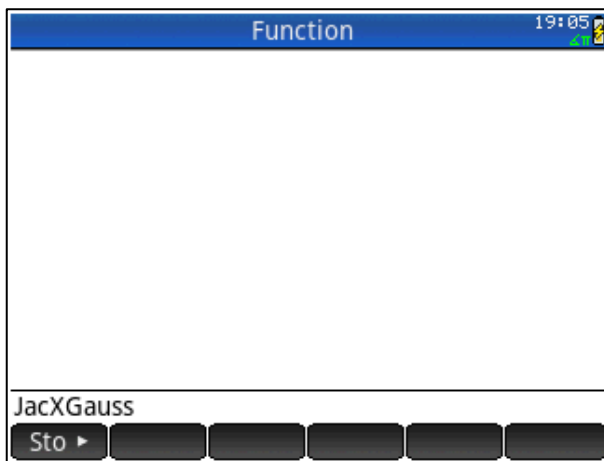
### Example:

Use the Gauss-Seidel method to solve the next linear system:

$$\begin{cases} 3X_1 - X_2 + X_3 = 1 \\ 3X_1 + 6X_2 + 2X_3 = 0 \\ 3X_1 + 3X_2 + 7X_3 = 4 \end{cases}$$

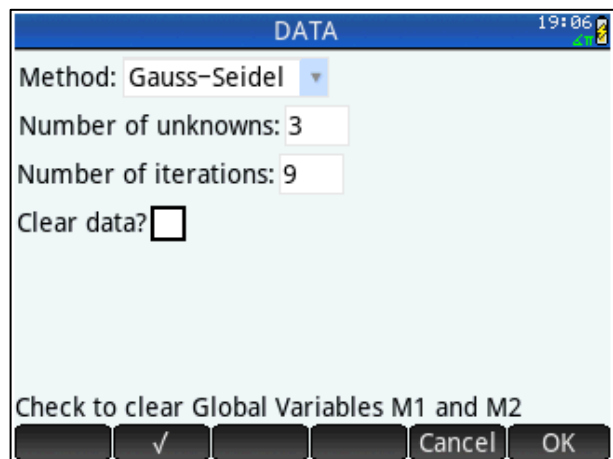
### How to use the program:

- Run the program in the HOME window.



- Input the data requested by the program:

- ✓ Select the method (Jacobi or Gauss-Seidel).
- ✓ Input the number of unknowns.
- ✓ Input the number of iterations.
- ✓ *Clear data?* This program uses the GLOBAL variables M1 and M2, so if you want to clear these two variables, check the box; if want to use the matrices stored in M1 and M2, don't check the box.



- Enter the augmented matrix  $[A|b]$ .

AUGMENTED MATRIX: $[A   b]$ ( $Ax=b$ )				
	X1	X2	X3	b
1	3	-1	1	1
2	3	6	2	0
3	3	3	7	4
4				

Edit More Go To Go → Cancel OK

- Enter the initial approximation.

INITIAL APROXIMATION	
	1
X1:	0
X2:	0
X3:	0
4	

Edit More Go To Go → Cancel OK

Results:

- Spectral Radius.

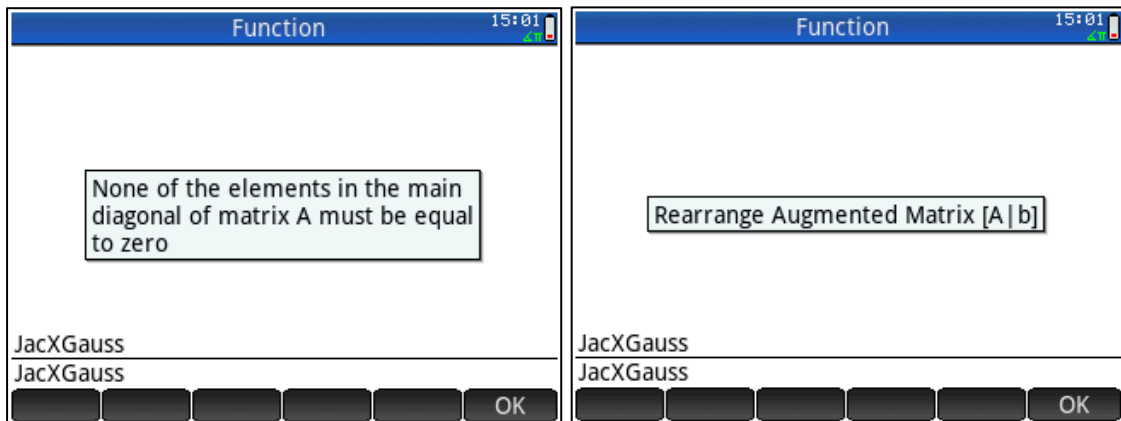
Function
Spectral Radius=0.243322487079

OK

➤ Iterations.

RESULTS				
	X1	X2	X3	Tolerance
i:0	0	0	0	0
i:1	0.3333333	-0.166667	0.5	0.6236096
i:2	0.1111111	-0.222222	0.6190476	0.2581501
i:3	5.2910E-2	-0.232804	0.6485261	6.6093E-2
i:4	3.9557E-2	-0.235954	0.6555987	1.5436E-2
i:5	3.6149E-2	-0.236608	0.6573393	3.8816E-3
i:6	3.5351E-2	-0.236789	0.6577590	9.1975E-4
i:7	3.5151E-2	-0.236828	0.6578618	2.2862E-4
i:8	3.5103E-2	-0.236839	0.6578867	5.4682E-5
i:9	3.5091E-2	-0.236841	0.6578928	1.3490E-5
11				
<div> Edit More Go To Go → Cancel OK </div>				

- ❖ **NEW in v1.2:** If at least one of the elements in the main diagonal of matrix A is zero, calculations cannot be made and the program will demand you to rearrange the augmented matrix  $[A|b]$ .



- ❖ **NEW in v1.1:** If the value of the spectral radius is less than one, the iterations converge to the unique solution and the program will show the iterations. However, if the spectral radius is greater than one, the iterations will not converge and the program will ask you if you want to rearrange the augmented matrix  $[A|b]$ .

