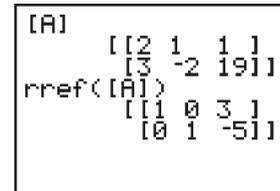
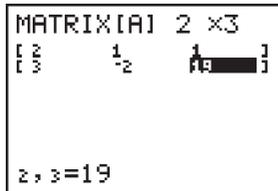
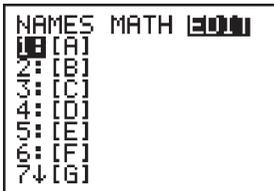


**Note 5A • Using Matrices to Solve Systems**

This calculator has a built-in routine to convert a matrix into its equivalent solution form. Enter as MATRIX [A] the matrix that represents the system of equations you wish to solve. Note that this matrix must have one more column than its number of rows; for example, its dimensions might be  $2 \times 3$ ,  $3 \times 4$ , or  $7 \times 8$ . In the Home screen, press  $\boxed{2\text{nd}}$  [MATRIX], select [MATH], and select B:rref(. Then press  $\boxed{2\text{nd}}$  [MATRIX]  $\boxed{1}$  ([A])  $\boxed{\downarrow}$  [ENTER]. (On the TI-83, press [MATRX] for the matrix menu.)

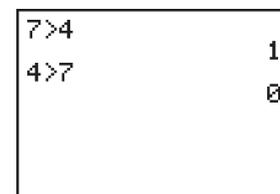
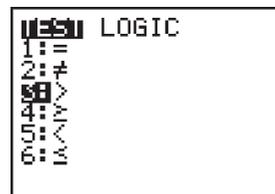
As an example consider the system  $\begin{cases} 2x + y = 1 \\ 3x - 2y = 19 \end{cases}$



The solution to the system is  $x = 3$  and  $y = -5$ .

**Note 5B • Inequality Symbols**

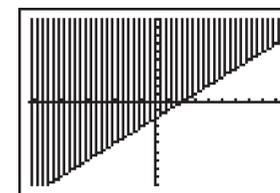
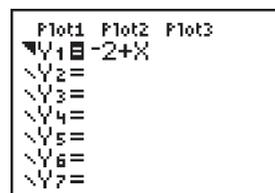
This calculator can test or evaluate an expression to determine whether it is true or false. This is called a Boolean test, after the mathematician Charles Boole. To find the equality and inequality symbols, press  $\boxed{2\text{nd}}$  [TEST]. An expression is evaluated as 0 if it is false and as 1 if it is true.



**Note 5C • Graphing Inequalities in Two Variables**

This calculator can graph an inequality in two variables by shading the screen above or below the graph of an equation. Enter an equation into the Y= screen. Then, in that same line, move the cursor as far left as it will go and press [ENTER]. Each time you press [ENTER], the graph style changes and is indicated by the flashing cursor. To see the graph, press [GRAPH].

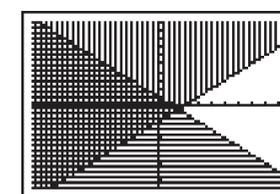
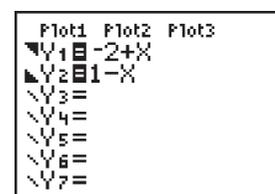
To graph the inequality  $y \geq -2 + x$ , enter the equation for the line  $Y_1 = -2 + x$  into the Y= screen. Then, move the cursor to the left of  $Y_1$  and press [ENTER] [ENTER] to set the graph style to shade the portion of the screen above the line. Finally, press [GRAPH].



$[-10, 10, 1, -10, 10, 1]$

You can graph a system of inequalities by graphing two (or more) inequalities on the same screen.

To graph the system of inequalities  $\begin{cases} y \geq -2 + x \\ y \leq 1 - x \end{cases}$  graph the first inequality as previously shown. Then, enter the equation for the line  $Y_2 = 1 - x$  into the Y= screen. Move the cursor all the way to the left and press [ENTER] [ENTER] [ENTER] to set the graph style to shade the portion of the screen below the line. Finally, press [GRAPH].

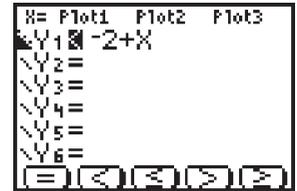


$[-10, 10, 1, -10, 10, 1]$

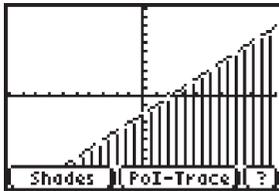
**Note 5C/App • Graphing Inequalities Using the Inequalz App**

An inequality graphing application is available for the TI-83 Plus and TI-84 Plus. It comes preloaded on the TI-84 Plus, and can be downloaded for the TI-83 Plus. Once you have the application on your calculator, follow these steps to use it.

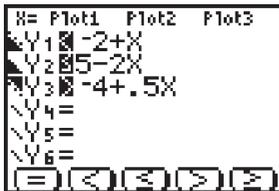
Press **[APPS]**, scroll down to :Inequalz, and press **[ENTER]**. Press any key to continue. Enter an expression and move onto the equals symbol. You'll see five choices, =, <, ≤, >, and ≥, appear at the bottom of the screen. Press **[ALPHA]** then one of the five keys in the top row of your calculator to select the equality or inequality key you want. (For example, press **[ALPHA]** **[F2]** to choose <.)



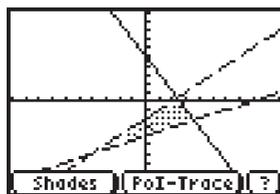
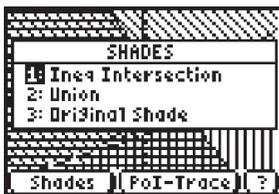
Press **[GRAPH]** to graph the equation or inequality.



The Inequalz App is particularly useful if you want to graph the solution to a system of inequalities. For example, three inequalities are graphed here. It is not easy to identify the solution region.



To shade only the solution region, press **[ALPHA]** **[F1]** to select Shades. Select 1:Ineq Intersection. Now only the solution region—the region where all three inequalities intersect—is shown.



When finished graphing inequalities, quit the application by pressing **[APPS]**, scrolling down to :Inequalz, pressing **[ENTER]**, and selecting 2:Quit Inequal.