Topics in Calculus:
Prerequisites: Functions and Equations

Piecewise Defined Functions

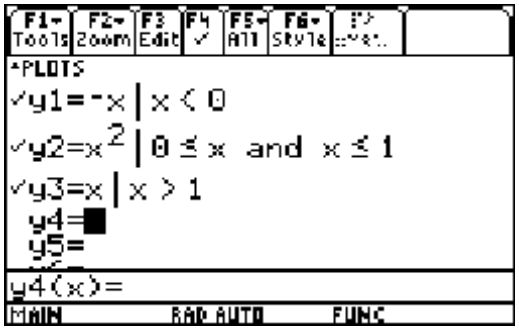
NCTM Principles and Standards

- **Content Standard:** Represent and analyze mathematical situations and structures using algebraic symbols
- **Process Standard**: Use representations to model and interpret physical, social, and mathematical phenomena

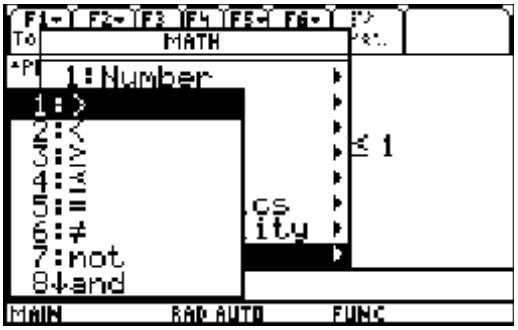
The ability to graph piecewise defined functions is a basic skill necessary for students studying calculus. The syntax for graphing piecewise functions on the TI-89 is a bit different from the TI-83 Plus. The TI-89 has the "such that "symbol [|] immediately to the left of the [7] key.

To graph the piecewise defined function $y = \begin{cases} -x, x < 0 \\ x^2, 0 \le x \le 1 \\ x, x > 1 \end{cases}$

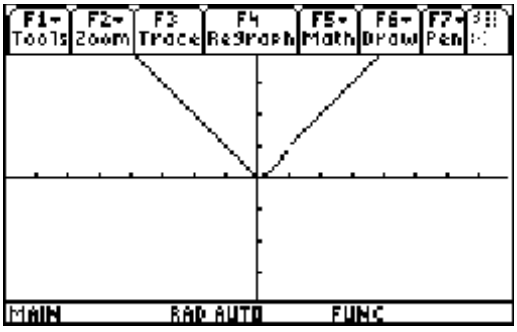
- Press [◆][F1]to access the y= menu. Enter the function by typing the function , [|], and the domain for that piece of the function. The symbols < and > are accessed by pressing [2nd][0]and [2nd][.] respectively.



- The symbols for ≤ and ≥ are found in the MATH folder. To access those symbols press [2nd][5][8][ENTER](or ▶) [3] or [4]. Notice that and/or is also found on this menu. Press ▼ to see the items at the bottom of the list. And/or may also be found in the catalog.

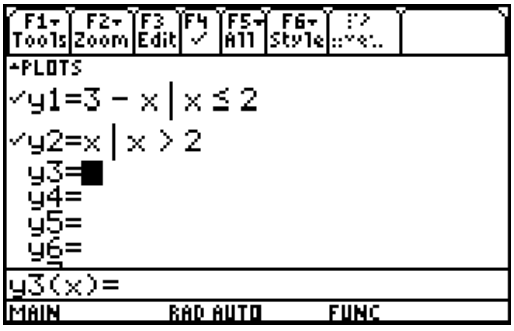


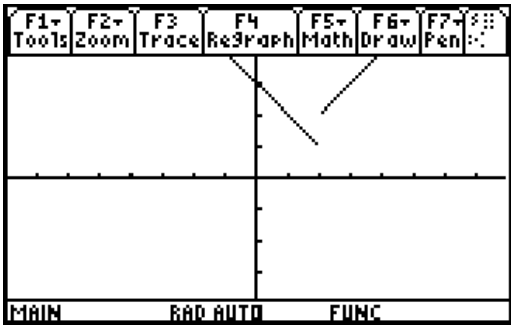
- To define the window press [◆][F2] and enter appropriate values. Graph the function by pressing [◆][F3].



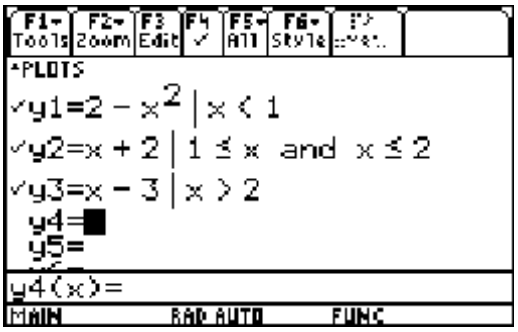
Graph the following piecewise defined functions:

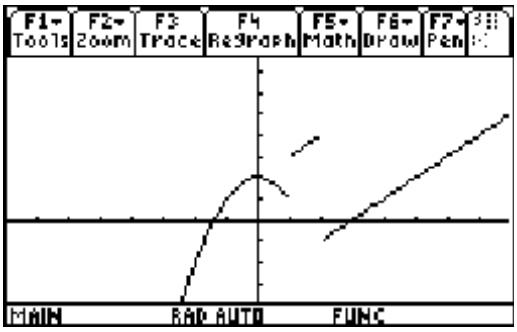
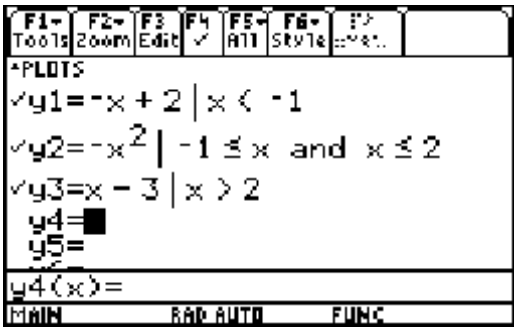
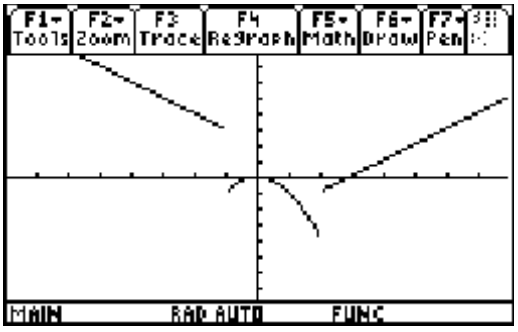
1. $y=\begin{cases}3-x, x\le 2\\ x, x>2\end{cases}$





2. $y=\begin{cases}2-x^2, x<1\\ x+2, 1\le x\le 2\\ x-3, x>2\end{cases}$





3. $y=\begin{cases}-x+2, x<-1\\ -x^2, -1\le x\le 2\\ x-3, x>2\end{cases}$