Piecewise Functions

To graph a piecewise function, you must enter each rule (each formula of the function) in *parentheses* with the interval of the domain for that rule in a second set of *parentheses* following it. Then you may use **multiplication** or **division** between the formula and the interval of the domain. Also, you should change from CONNECTED to DOT MODE if you used multiplication. Try ZOOM ZDECIMAL or ZOOM ZINTEGER if the function contains isolated points.

Method 1 (Division Method)

Example 1: $f(x)=\begin{cases}1 & x<0\\ x^2+1 & x\geq 0\end{cases}$

Enter: $Y_1=(1)\div(x<0)$

$Y_2=(x^2+1)\div(x\geq 0)$

- *x* is found on the X,T,θ,n button
- Inequalities are found in **TEST** by hitting **2ND MATH** and **TEST** will be highlighted, and then choose the appropriate inequality by entering its number.

Example 2: $g(x)=\begin{cases}x+4 & x\leq -2\\ 2 & -2<x<2\\ 4-x & x\geq 2\end{cases}$

Enter: $Y_1=(x+4)\div(x\leq -2)$

$Y_2=(2)\div((-2<x)\text{ and }(x<2))$

$Y_3=(4-x)\div(x\geq 2)$

- Inequalities are found in **TEST** by hitting **2ND MATH** and **TEST**
- **AND** is found in **TEST (2nd MATH)** arrow right to **LOGIC** then chose **and**.

Curve Fitting

*NOTE: Before we start, go into the catalog (2^{nd} 0) and put the Diagnostics On (DOWN ARROW until the left arrow is pointing to Diagnostics On then hit ENTER twice).

Follow these steps to get the information into the calculator:

1. Hit STAT key.
2. There should be a dark box over the word EDIT and 1: Edit. Hit ENTER
3. There should be a dark box under L1. Enter your independent variables here. Type each value followed by ENTER.
4. Use the RIGHT ARROW to get to the L2 column and enter your dependent variables under L2. Type in each value, followed by ENTER.

   NOTE: If there are values in your list, clear them out by following these steps:
   1. Using the UP ARROW highlight the list name (L1)
   2. Hit CLEAR
   3. Hit ENTER (Repeat for L2 if necessary)

5. Hit 2^{nd} STAT PLOT (which is over the Y=).
6. There should be a dark box over STAT PLOT and 1: Plot 1. Hit ENTER.
7. There should be a blinking box over the word ON. Hit ENTER, a dark box should on the word ON.
8. Using the DOWN ARROW, navigate down the list and select the following:
   Type: highlight the first one (scatter plot) , just dots and hit ENTER
   Xlist: L1 (if L1 is not there, hit 2^{nd} then L1 which is above the #1 key).
   Ylist: L2 (if L2 is not there, hit 2^{nd} then L2 which is above the #2 key).
   Mark: highlight the first one, the square looking dot and hit ENTER.
9. Hit ZOOM.
10. Choose 9: ZoomStat.
11. You should see boxes on the screen that represent your data.

Follow these steps to get the equation that best represents (fits) the data:

1. Hit STAT.
2. Using the RIGHT ARROW, highlight CALC (<u>DO NO HIT ENTER!!!!</u>)
3. Choose 4: LinReg(ax+b) and then hit ENTER.
4. You should have the parameters on the screen.

Follow these steps to get the equation to draw a graph:

1. Hit Y=
2. Hit VARS.
3. Choose 5: Statistics.
4. Using the RIGHT ARROW, choose EQ (<u>DO NOT HIT ENTER!!!</u>).
5. Choose 1: RegEQ. Hit ENTER.
6. Hit GRAPH.

Follow these steps to find additional values:

1. Get to Homescreen by hitting 2^{nd} QUIT first or CLEAR.
2. Hit VARS.
3. Using the RIGHT ARROW highlight Y-VARS.
4. Hit ENTER (for Function which is already highlighted).
5. Choose 1: Y1 and then hit ENTER.
6. You should see Y1 on the screen. Type (?) in the *x* value. Hit ENTER.