2.3 Graph a function

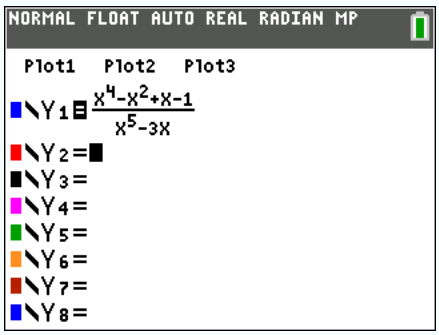
Suppose you want to have a good graphical understanding of the function

$$f(x) = \frac{x^4 - x^2 + x - 1}{x^5 - 3x}.$$

2.3.1 Put the function in your calculator

Enter the function with the stat plot f1 y= button.

Tip1: You can create a fraction by pressing A-lock alpha , stat plot f1 y= , n/d



2.3.2 Display the graph of a function correctly

tip1: Make sure only the functions you're using are displayed. To deactivate/activate a function's display, press stat plot f1 y= , and go to the function you want to activate/deactivate. highlight the "=" symbol and press entry solve enter ("▬" means it's activated, "=" means it's deactivated).

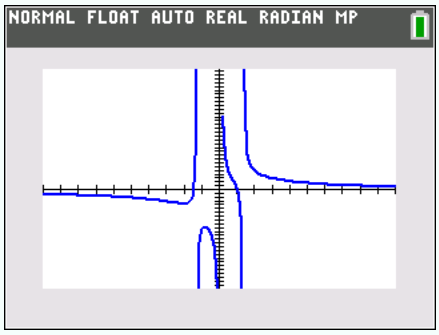
Tip2: When the calculator is drawing the graph of a function, it locks itself from doing anything else until the loading symbol ▪ next to the battery symbol ▯ ends. If you want to abort the drawing, press 2nd , off on .

① Press tblset f2 window and select `Xmin`, `Xmax` according to the problem you want to solve. Since here it is hard to know, we try `Xmin:-10` and `Xmax:10`.

Choose an `Xscl` more or less twenty times smaller then the gap between `Xmin` and `Xmax` (the role of `Xscl` is to set the distance between tick marks on the $x-$axis). Usually we set `Xscl` to be powers of 10.

② Choose `Ymin` and `Ymax` according to the problem chosen. You want `Ymin` a bit smaller than the minimal $y-$value desired, and `Ymax` a bit above the maximal $y-$value desired.

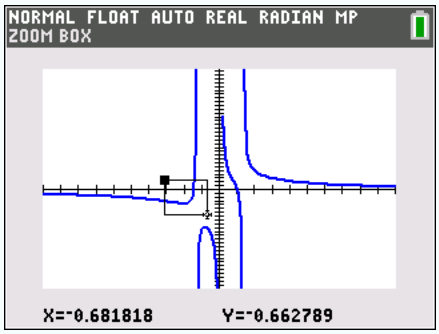
If you don't know what $y-$values to choose, press format f3 zoom ZoomFit to make the $y-$values graph prettily [2] the function according to what we chose in point ①. It should display this:



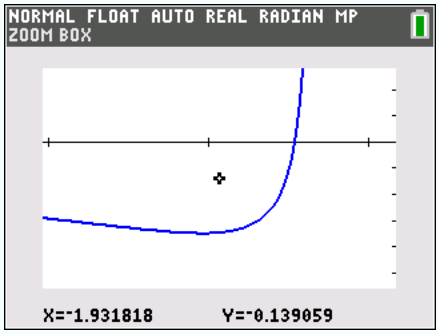
③ To display a specific part of the graph (here: the first local minimum), press format f3 zoom , ZBox.

Use ▲▼◀▶ to move to a point on the screen that you want the top left corner of the screen to be, and press entry solve enter .

Use again ▲▼◀▶ to the future bottom right part of the screen:



Press entry solve enter . Here, it should display the box you framed:



[2] ZoomFit recalculates YMin and YMax to include the minimum and maximum $y-$values of the selected functions between the current XMin and XMax. XMin and XMax are not changed.

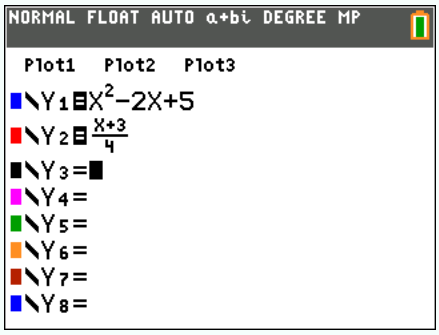
④ If you wish to zoom out in order to zoom in to another part of the graph, press format f3 zoom , Zoom Out and entry solve enter .

2.3.3 Graph the sum of functions

Suppose you want graph the sum of the following functions:

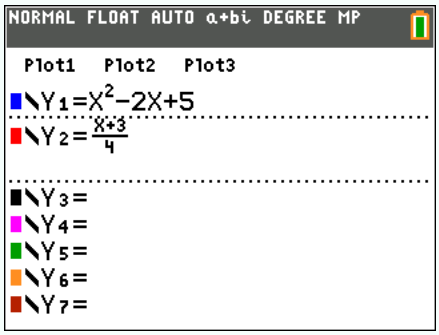
$$f(x) = x^2 - 2x + 5 \qquad g(x) = \frac{x+3}{4}.$$

① Enter the two functions using the stat plot f1 y= button:

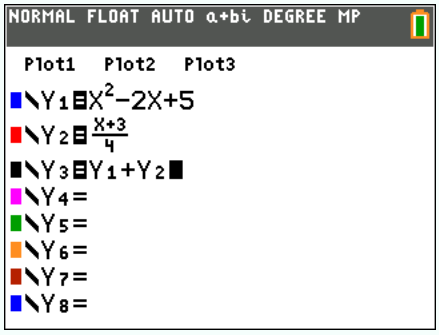


The fraction is done pressing A-lock alpha , stat plot f1 y= and n/d

② Deactivate the graph of Y_1 and Y_2 by highlighting the "=" symbol on Y_1 and Y_2 and pressing entry solve enter ("≡" means it's activated, "=" means it's deactivated):



③ define Y_3 as $Y_1 + Y_2$:



To access Y_1 and Y_2, press A-lock alpha and calc f4 trace

④ press table f5 graph to display the graph of Y_3 (see 2.3.2 to display the graph correctly)

The same goes for subtraction, multiplication or division of two functions.