Calculator Appendix N

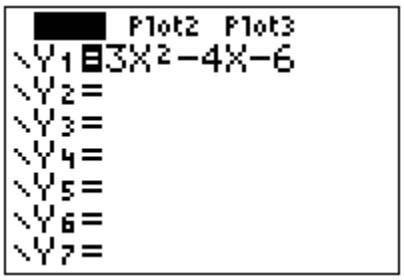
(Finding roots)

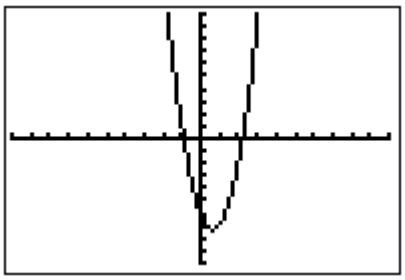
The root of a function is simply the *x* value of where it crosses the x-axis. It is possible for a function to have several roots.

Other names for **root** are **zero** and **x-intercept**. On a graphing calculator it is called a zero to emphasize that the value of the function is y = 0.

Consider the function $y = 3x^2 - 4x - 6$. Finding the roots of this function is equivalent to solving the equation $3x^2 - 4x - 6 = 0$.

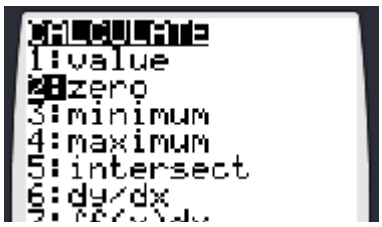
Begin by pressing the **Y=** button and entering the function as **Y1**. Then press **GRAPH**.



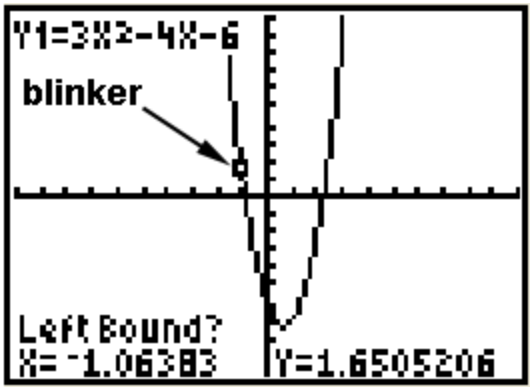


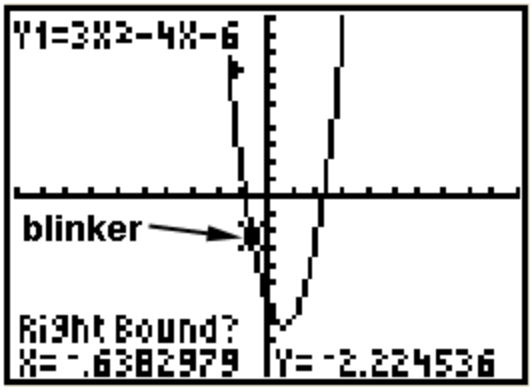
Clearly, from the graph there are two roots. We will concentrate on the left root.

To initiate the process of finding a root, press **2nd | CALC**. From the resulting menu choose **2: zero** by pressing the **DOWN ARROW** button thus moving the cursor down to **2**: and then pressing **ENTER**, or by just pressing the **2** button.



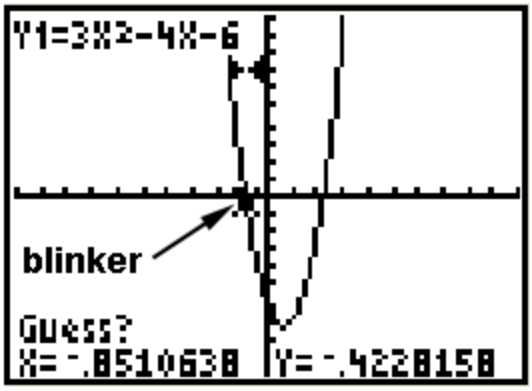
The next screen will show the graph along with a question, “Left Bound?”. Move the blinker with the **LEFT/RIGHT ARROWS** until it is clearly to the left of the desired root (in this case, the left root). Press **ENTER** when satisfied with the position.

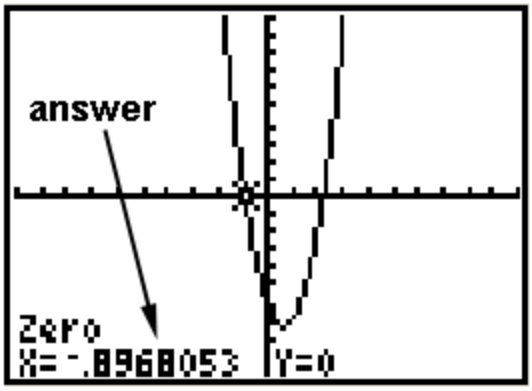




At this point another question will appear asking for the “Right Bound?”. Move the blinker with the **LEFT/RIGHT ARROWS** until it is clearly to the right of the desired root. Press **ENTER**.

Finally, a third question is presented asking for a, “Guess?” Using the **LEFT/RIGHT ARROWS**, position the blinker approximately over the root and press **ENTER**.





At this point the answer is presented at the bottom of the screen.

The other root is found in a similar fashion.