

ZERO
TI-83 QUICK REFERENCE

The ZERO feature of the TI-83 is used to find the zeros (roots or x-intercepts) of a function. This feature is called "ROOT" on the TI-82 and TI-85.

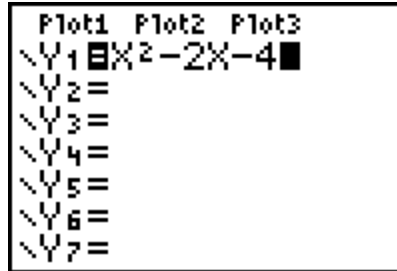
1. Enter the function in the Y= screen and ensure that it is selected.
2. Press 2ND CALC
TRACE to activate the CALC menu.
3. Press 2 to select the **zero** feature.
4. Set the left bound by moving the cursor to a point to the left of the x-intercept. Press ENTER.^{**}
5. Set the right bound by moving the cursor to a point to the right of the x-intercept. Press ENTER .
5. Move the cursor close to the x-intercept and press ENTER .
6. The zero will be displayed at the bottom of the calculator screen.
7. Repeat from the second step to find additional zeros.

^{**} If more than one function has been graphed, press the up (or down) arrow until the appropriate function is selected.

EXAMPLE
ZERO - USING THE TI-83

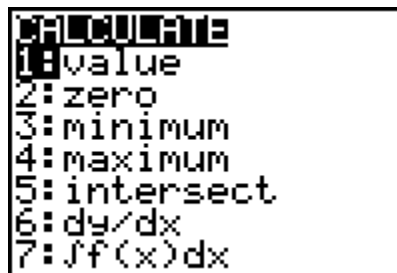
We will find the zeros for the function $f(x) = x^2 - 2x - 4$. Recall that the zeros (roots or x-intercepts) of a function are the x-coordinates of the points where the graph crosses the x-axis. You will be instructed step-by-step. **After** you execute a step, your screen should appear as indicated below the instruction.

Enter the function in the Y= screen. Ensure that it is "selected." For our purposes, it is best if no other functions are selected.

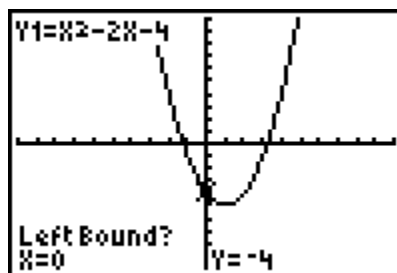


You may graph the function if you wish. This would allow you to ensure that all zeros are in the window, but this is not required. Our function may be graphed with a ZOOM STANDARD.

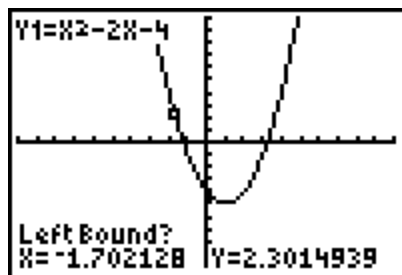
Press 2ND CALC TRACE .



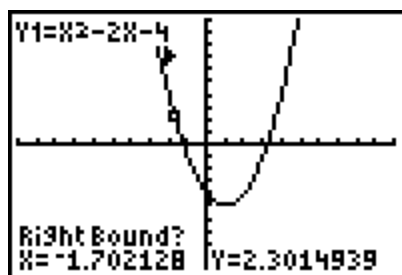
Press 2 for **zero**.



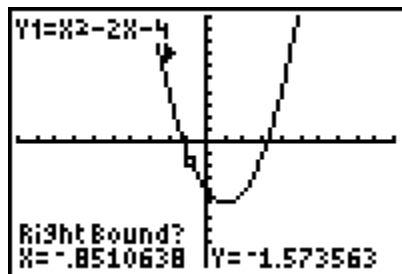
We will find the zero at the left first. Use the arrow keys to move the cursor to the left of the left-most zero.



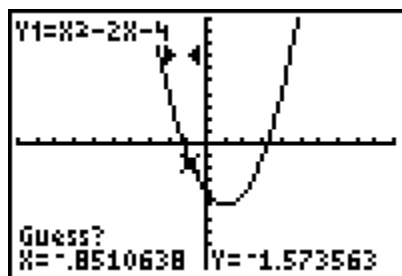
Press to set the left bound.



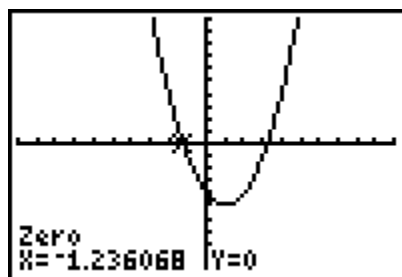
Move the cursor to the right of the left-most zero but do not move as far as the right-most zero.



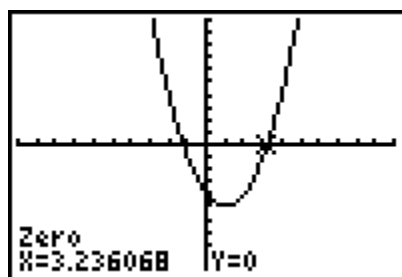
Press to set the right bound.



Move the cursor close to the zero and press **ENTER**. The zero is displayed at the bottom of the screen. Our zero is approximately -1.236068.**



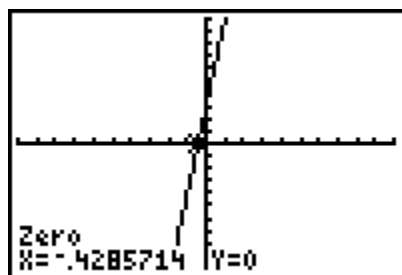
To find the right-most zero, press **2nd** **CALC** **TRACE** **2** and repeat the process. The second zero, approximately 3.236068, is shown below.



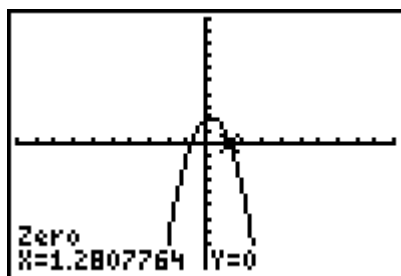
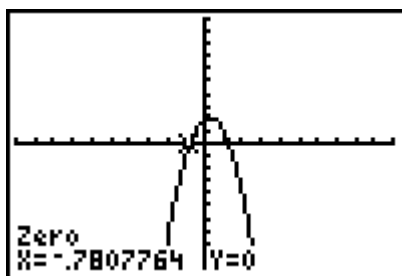
** The exact position of the cursor when the left bound, right bound or guess is set is not critical. You must only ensure that there is only one zero between the left and right bounds. You can typically use the right bound as your guess.

EXERCISES with ANSWERS

1. Find the approximate zero(s) for $f(x) = 7x+3$.



2. Find the approximate zero(s) for $f(x) = -2x^2 + x + 2$.



3. Find the approximate zero(s) for $f(x) = x^2 - 10x - 12$.
HINT: Set the window with Xmin=-10, Xmax=20, Ymin=-40 and Ymax=10.

