

Finding real solutions for equations with the TI-83/84

Method of x-intercepts:

Starting from the Home screen(command line).

1. Enter function editor.
Press **Y=**.
2. Erase or deselect any existing functions.
If any other functions are entered:
Either use the **CLEAR** key to erase them,
or for each function, put the cursor on the "=" sign beside the function and if the "=" is reversed(white on black), press **ENTER** so that the function won't graph but is still in the calculator.
3. By hand, move all the terms to one side of the equation. (set it equal to 0)
4. Enter the side of the equation that's not 0.
If no other functions are entered, set Y1 equal to the non-zero side of the equation.
But if there are already functions entered that you want to keep, move the cursor down until you get a blank function. Type in the non-zero side of the equation. Take note of the function's number.
5. Return to the graph screen with a standard viewing window if no window information is given. If you are given a window or interval in which to find the solution, skip to step 7.
Press **ZOOM 6:Zstandard**.
6. Make sure at least one x-intercept is showing.
If not, zoom out until one is seen.
Press **ZOOM 3:Zoom Out ENTER**.
Wait for the graph to redraw.
If you still don't see an x-intercept, press **ENTER** again until one is show.
7. Enter the calc menu.
Press **2nd CALC**.
8. Enter x-intercept (zero) mode. Keep in mind that real zeros are x-intercepts and x-intercepts are zeros.
Press **2:zero**.
9. Verify the function in the top left corner is the function.
If not, press either (**cursor up**) or (**cursor down**) until it is the function's number.
10. Set the bounds for the intersection.
Move the cursor to the left of the desired x-intercept.
Press **ENTER**.
Move the cursor to the right of the desired x-intercept.
Press **ENTER**.
11. Set the guess for the x-intercept.
Move the cursor close to an x-intercept.
Press **ENTER**.
Wait for the calculator to find the x-intercept.
12. When done a solution to the equation will appear at the bottom of the screen as the value of x.
13. If there are other solutions to find,
go back to step 7.

You may have to zoom out again to find other x-intercepts.

How do you know you have all the solutions?

Classify the equation as radical, rational, linear, quadratic, cubic, etc.

Answer the following questions.

Have you found the expected number of solutions for that type of equation? (one for a linear equation, two for a quadratic equation, etc.)

If not, is this a situation I would get a different number of solutions than expected?