

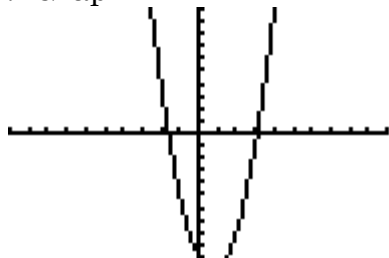
Enrichment
Objective 4.02
Finding the Solutions of Quadratic Functions

Use your graphing calculator to find the solutions of the following:

$$y = 2x^2 - 3x - 10$$

Step 1: Enter in the function in Y=

Step 2: Graph



The solutions of a quadratic equation are the x-intercepts. As you can see from the graph, the parabola crosses the x-axis twice so there are two solutions.

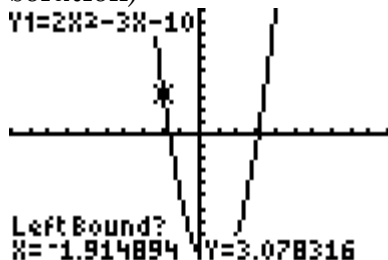
Step 3: 2nd Trace (Calc) #2 (zero)

You will have to do this two times—one for each solution.

Step 4:

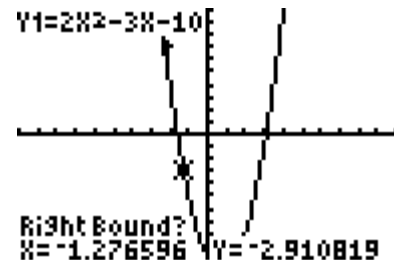
Left Bound? Enter

(Cursor to the left of the solution)

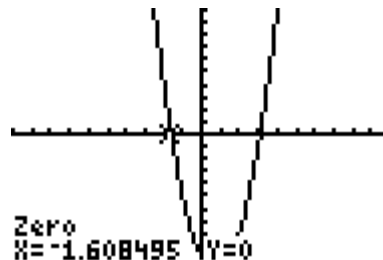


Right Bound? Enter

(Cursor to the right)



Guess? Enter



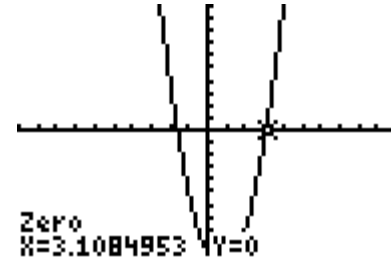
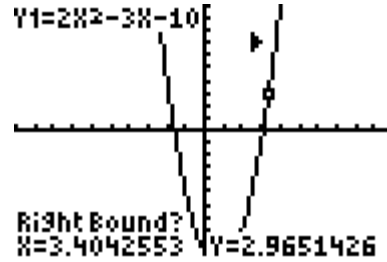
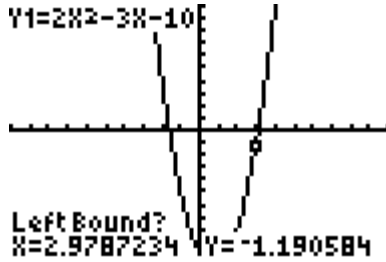
The zero appears at the bottom. One solution is -1.61

Now repeat this process to find the other solution. Go back to 2nd Trace #2.

Left Bound? Enter
(This time the cursor is below the zero)

Right Bound? Enter
(cursor is above)

Guess? Enter



The other solution is 3.12

The solutions of the quadratic are $x = -1.61$ and $x = 3.12$

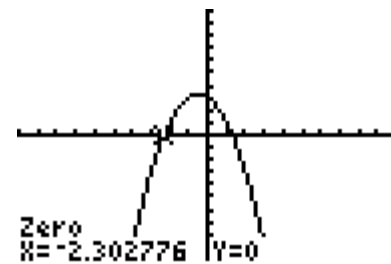
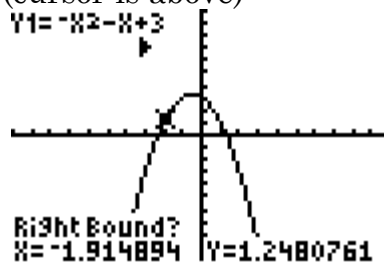
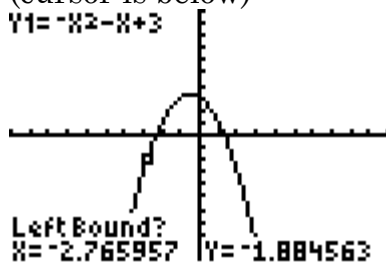
Let's try another one:

$$y = -x^2 - x + 3$$

Left Bound?
(cursor is below)

Right Bound?
(cursor is above)

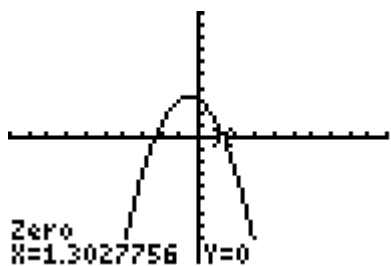
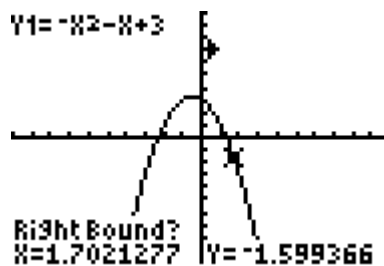
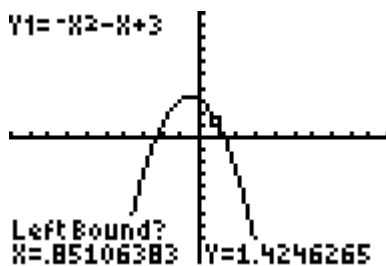
Guess?



Left Bound?
(cursor above)

Right Bound?
(cursor below)

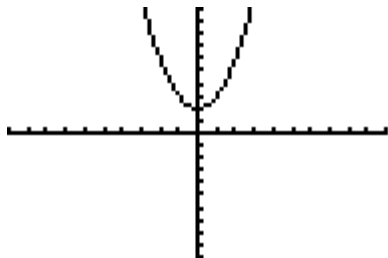
Guess?



The solutions are $x = -2.3$ and $x = 1.3$

If the graph doesn't cross the x-axis, there are no x-intercepts. Since the x-intercepts are the real solutions, these graphs have no real solution.

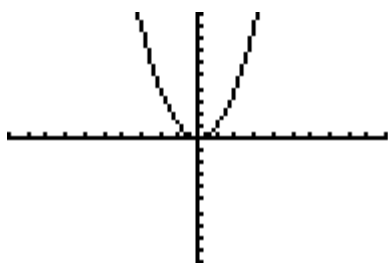
Example: $y = x^2 + 2$



Likewise, if the graph touches the axis only once, the equation will have only one real solution.

Example: $y = x^2$

The solution is $x = 0$



You Try:

Find the following solutions using your graphing calculator:

1. $y = -3x^2 - 3x + 2$

2. $y = x^2 + 8x - 4$

3. $y = 2x^2 + 2$

4. $y = x^2 - 4x + 4$

Answers: 1) $x = -1.46, .46$ 2) $x = -8.47, .47$ 3) no real solution 4) 2