

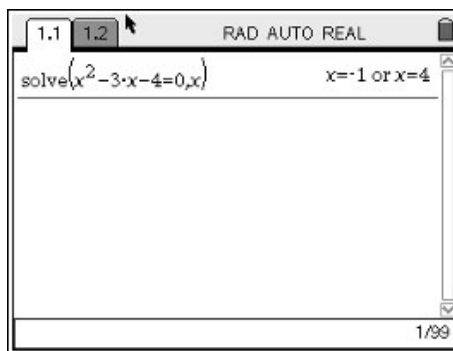
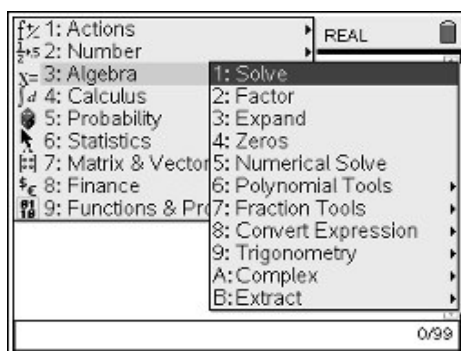
Solving Quadratic Equations Using a CAS

The *standard form* of a quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$, and a , b , and c , are integers. The solutions of a quadratic equation are called the *roots* of the equation and are located at the x -intercepts of the graph of the related quadratic function. You can use a computer algebra system (CAS) to solve quadratic equations.

Example Use a Computer Algebra System

Use a CAS to solve $x^2 - 3x + 4 = 0$.

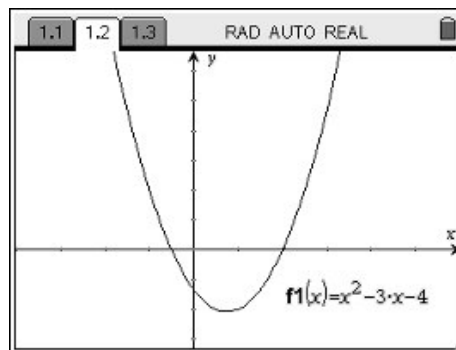
Under the Home menu, select **Calculator**. Next, press the menu key, scroll down to **Algebra**, and select **Solve**. Enter the quadratic equation as shown to solve for x .



Therefore, the solutions of the equation are -1 and 4 .

CHECK You can check your answer by graphing the related function $f(x) = x^2 - 3x + 4$.

Select **Graphs & Geometry** under the Home menu. Then enter the related function as $f_1(x)$ and press enter.



$[-8, 12]$ scl: 2 by $[-10, 20]$ scl: 3

From the graph, you can see that the x -intercepts are -1 and 4 . ✓

Exercises

Use a CAS to solve each equation.

1. $x^2 + 2x - 15 = 0$

2. $x^2 - 8x + 12 = 0$

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

4. $-x^2 - 8x = 16$

5. $2x^2 + 16x = 0$

6. $x^2 + 5 = -8x - 11$

7. $-18 = -x^2 + 3x$

8. $12 - x^2 = 48 - 12x$

9. $-x^2 + 3 = -2x - 21$

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Answers

- 1.** $-5, 3$
- 2.** $2, 6$
- 3.** $-2, 5$
- 4.** -4
- 5.** $-8, 0$
- 6.** -4
- 7.** $-3, 6$
- 8.** 6
- 9.** $-4, 6$