

Graphing Technology Lab

Cubic Functions

You have studied linear functions and monomials. Some functions can be defined by the sums of monomials. One function that can be defined this way is a cubic function. A **cubic equation** has the form $ax^3 + bx^2 + cx + d = 0$, where $a \neq 0$. All cubic equations have at least one but no more than three real roots. You can use TI-Nspire technology to graph cubic functions.

ACTIVITY

Solve $x^3 - 6x^2 + 3x + 10 = 0$ by graphing.

Step 1 Enter the related function in the graph entry line.

KEYSTROKES: 6: New Document 2: Add Graphs & Geometry 3 6 3 10

Step 2 Graph the function in the standard viewing window.

KEYSTROKES: 4: Window 1: Window Settings 10 10 15 15

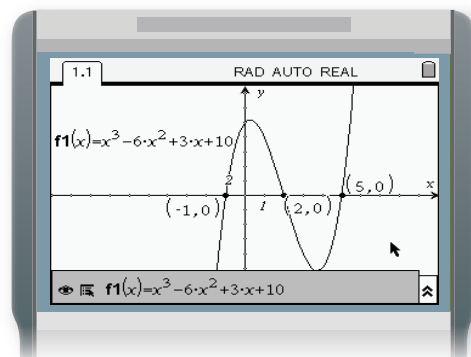
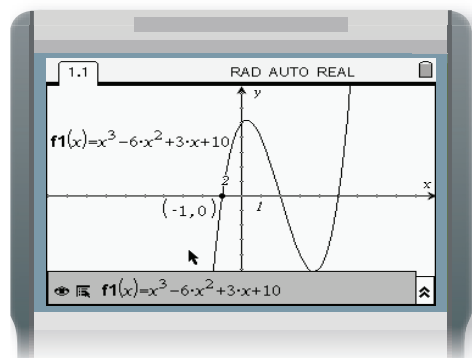
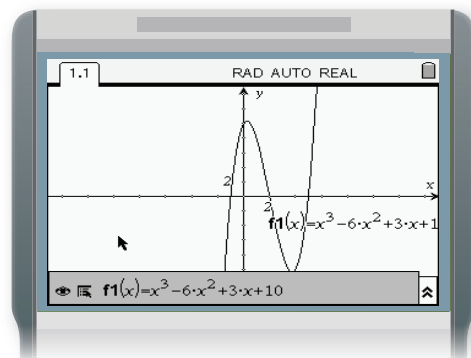
Step 3 Find the zeros of the function by determining where the graph crosses the x -axis. Notice that this graph crosses the x -axis three times. Therefore, there are 3 real solutions for the equation.

KEYSTROKES: 6: Points & Lines 3: Intersection Point(s)
Press on the x -axis and press on the curve.

Label the points of intersection.

KEYSTROKES: 1: Actions 7: Coordinates & Equations
Press twice on each point. Then press .

The solutions for $x^3 - 6x^2 + 3x + 10 = 0$ are $x = -1, 2,$ and 5 .



Exercises

Solve each equation by graphing.

1. $x^3 - 4x^2 - 9x + 36 = 0$

2. $x^3 - 6x^2 - 6x - 7 = 0$

3. $x^3 + x^2 + x - 3 = 0$

4. $x^3 - 5x^2 - 2x + 24 = 0$