

Chapter 3 / **Example 34**

Solving polynomial inequalities

Use an algebraic method to solve the following inequality $x^3 + 4x^2 + x - 6 > 0$ and check your answer using a calculator.

Press $[f1]$ $[y=]$ to display the equation entry screen.

Type $x^3 + 4x^2 + x - 6$ and press $[enter]$ to enter the equation as Y_1 .

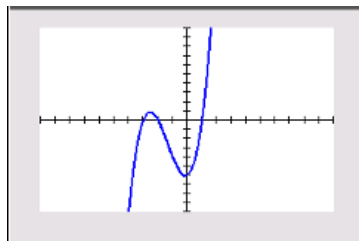
Plot1 Plot2 Plot3
 $Y_1 = X^3 + 4X^2 + X - 6$
 $Y_2 =$
 $Y_3 =$
 $Y_4 =$
 $Y_5 =$
 $Y_6 =$
 $Y_7 =$
 $Y_8 =$

Press $[f5]$ $[graph]$ to display the graph screen

The GDC now displays the quadratic function:

$$Y_1 = x^3 + 4x^2 + x - 6$$

The default axes are $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$.

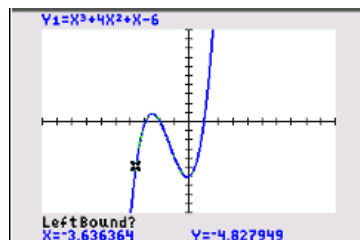


To find the zeros press $[2nd]$ $[f4]$ $[calc]$ 2:zero

You will need to give the left and right bounds of the region that includes the zero.

The GDC shows a point on the curve and asks you to set the left bound. Move the point using $[right arrow]$ $[left arrow]$ and choose a position to the left of the zero.

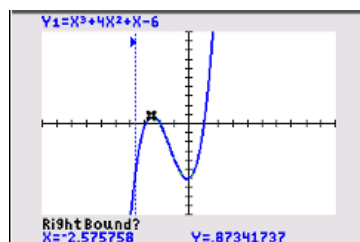
Press $[enter]$.



The GDC shows a line where you have set the left bound and a point on the curve.

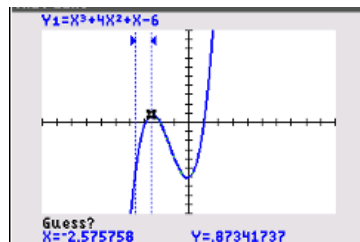
Move the point using $[right arrow]$ $[left arrow]$ and choose a position to the right of the zero.

When the region contains the zero, Press $[enter]$.



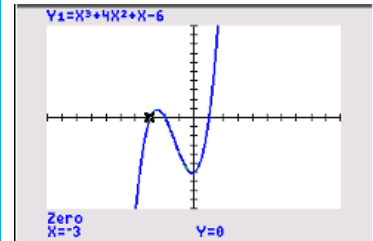
The GDC requires an initial guess for the position of the zero. Choose the default position.

Press $[enter]$.



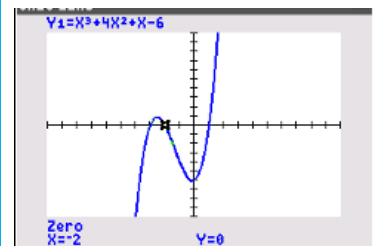
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The GDC displays a zero at $(-3, 0)$.



Repeat for the second zero.

The GDC displays a zero at $(-2, 0)$.



Repeat for the third zero.

The GDC displays a zero at $(1, 0)$.

$$x \in]-3, -2[\cup]1, \infty[$$

