

# Chapter 3 / Example 8

## Solving inequalities

Find the values of  $r$  for which the equation  $x^2 + 3rx + 1 = 0$  has

- a** two distinct real roots      **b** one real repeated root      **c** no real roots.

If there are two distinct roots then  $9r^2 - 4 > 0$ . One repeated root  $9r^2 - 4 = 0$  and no real roots  $9r^2 - 4 < 0$ .

Press **MENU** 5 **GRAPH** **Y=** to display the equation entry screen.

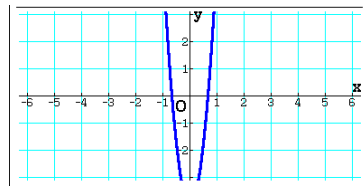
Type  $9x^2 - 4$  and press **EXE** to enter the equation as Y1.

Graph Func : Y=  
Y1:  $9x^2 - 4$  [—]  
Y2: [—]  
Y3: [—]  
Y4: [—]  
Y5: [—]  
Y6: [—]  
[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

Press **F6** DRAW to display the graph screen

The GDC now displays the functions  $Y1 = 9x^2 - 4$

The default axes are  $-6.3 \leq x \leq 6.3$  and  $-3.1 \leq y \leq 3.1$ .



To view the graph better, change the window settings.

Press **F3** V-WIN.

Change the settings to  $-2 \leq x \leq 2$  and  $-5 \leq y \leq 2$ .

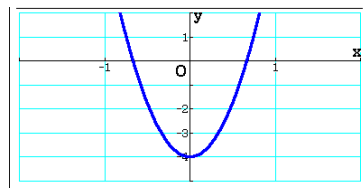
Leave everything else the same.

Press **EXIT** when you have finished.

View Window  
Xmin : -2  
max : 2  
scale: 1  
dot : 0.01058201  
Ymin : -5  
max : 2  
[INITIAL] [TRIG] [STANDARD] [V-MEM] [SQUARE]

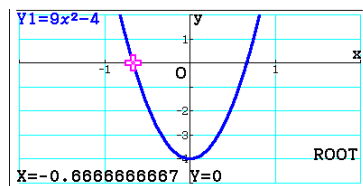
Press **F6** DRAW to display the graph screen.

The GDC displays the graph in a suitable window.



To find the zeros press **F5** G-SOLVE and then press **F1** ROOT.

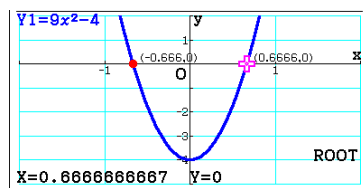
The GDC shows the first zero.



Press **EXE** to display the coordinates.

Press **▶** to move to the next zero and press **EXE** to display its coordinates.

Press **EXIT** to leave G-Solv mode and **F6** DRAW to display the graph screen again.



## Chapter 3 / **Example 8**

# Solving inequalities

The GDC displays the zeros at  $(-0.667, 0)$  and  $(0.667, 0)$ .

There are two distinct roots when  $r < -0.667$  or  $r > 0.667$ , one repeated root when  $r = -0.667$  or  $r = 0.667$  and no real roots when  $-0.667 < r < 0.667$ .

