

Chapter 10 / **Example 9**

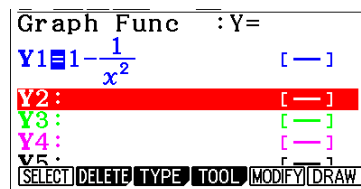
Use $\frac{dy}{dx} = 0$ to find a maximum or minimum point

Consider the derivative function $\frac{dy}{dx} = 1 - \frac{1}{x^2}, x \neq 0$.

- Plot the curve on a GDC.
- Find the values of x at which $\frac{dy}{dx} = 0$.
- State whether these points represent local maximum or minimum points on the curve for y , justifying your answer.

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

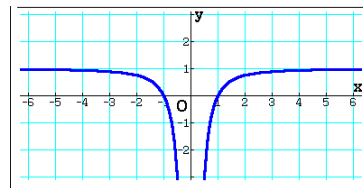
Type $1 - \frac{1}{x^2}$ using the fraction template **□** and press **EXE** to enter the equation as Y1.



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

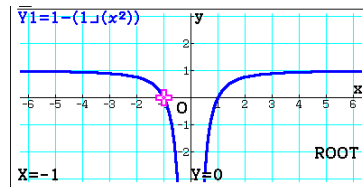
The GDC displays the graph Y1.

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



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

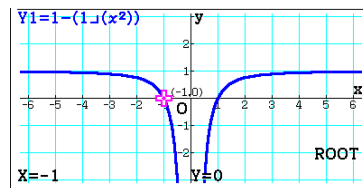
The GDC shows the first zero.



Press **EXE** to display the coordinates.

The GDC displays a zero at $-1, 0$.

$x = -1$ will be a maximum point as the gradient changes from positive to negative.



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

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

$x = 1$ will be a minimum point as the gradient changes from negative to positive.

