

Chapter 2 / Example 20

Solving absolute value function inequalities

Solve $\left| \frac{1}{2x-1} \right| < 1$ graphically.

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

Type $\left| \frac{1}{2x-1} \right|$ and press **EXE** to enter the first equation as Y1.

Use the absolute value function by pressing **OPTN** **F5** NUMERIC **F1** Abs and use the fraction template **□**.

Type 1 and press **EXE** to enter the second equation as Y2.

Graph Func : Y=

Y1 = $\left| \frac{1}{2x-1} \right|$ [—]

Y2 = 1 [—]

Y3 : [—]

Y4 : [—]

Y5 : [—]

[SELECT] [DELETE] [TYPE] [TOOL] [MODIFY] [DRAW]

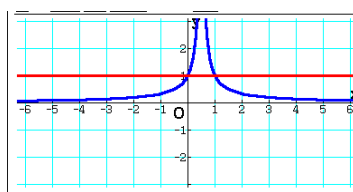
Press **F6** DRAW to display the graph screen

The GDC now displays the two functions:

$$Y1 = \left| \frac{1}{2x-1} \right|$$

$$Y2 = 1$$

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



To get a better view of the graphs press **F3** V-WIN.

Set the axes to show $-4 \leq x \leq 6$ and $-1 \leq y \leq 4$ with scales of 1.

You can leave the other items as they are.

Press **EXIT** when you have finished.

View Window

Xmin : -4

max : 6

scale : 1

dot : 0.02645502

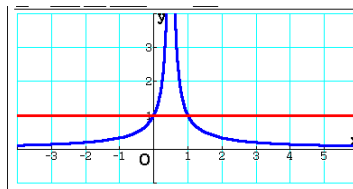
Ymin : -1

max : 4

[INITIAL] [TRIG] [STANDARD] [V-MEM] [SQUARE]

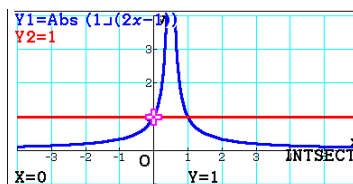
Press **F6** DRAW to display the graph screen.

The GDC displays the graphs in a suitable window.



To find the intersections press **F5** G-SOLVE and then press **F5** INTERSECT.

The GDC shows the first intersection.



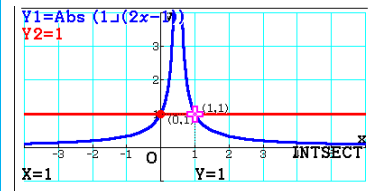
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Press **EXE** to display the coordinates.

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

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



The points of intersection are $(0,1)$ and $(1,1)$.

The solutions is $x > 1$; $x < 0$.

