

Chapter 2 / **Example 17**

Solving absolute value functions

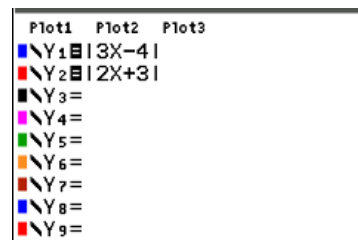
Solve $|3x - 4| = |2x + 3|$, and check your answer(s) both numerically and graphically.

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

Type $|3x - 4|$ and press $[enter]$ to enter the first equation as Y_1 .

Type $|2x + 3|$ and press $[enter]$ to enter the second equation as Y_2 .

To enter the absolute value function press $[math]$ \blacktriangleright NUM 1:abs(



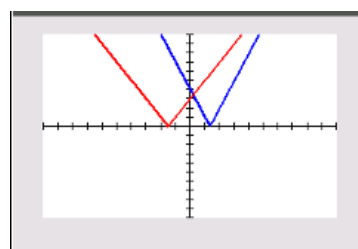
Press $[f5]$ $[graph]$ to display the graph screen

The GDC now displays both straight-line graphs:

$$Y_1 = |3x - 4|$$

$$Y_2 = |2x + 3|$$

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



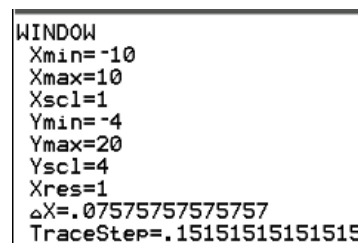
To be able to see both intersections you will need to change the window settings

Press $[f2]$ $[window]$

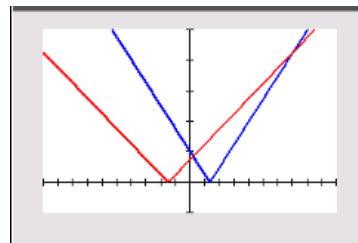
Set the axes to show $-4 \leq y \leq 20$ with a scale of 4.

You can leave everything else the same.

Press $[f5]$ $[graph]$ when you have finished.



The GDC displays the graphs in a suitable window.



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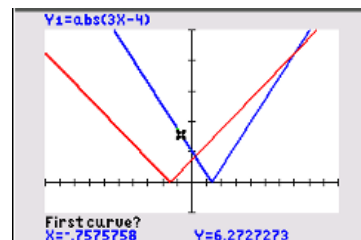
Solving absolute value functions

Press **2nd** **f4** **calc** 5:intersect

To find the intersection you need to choose the two lines that intersect.

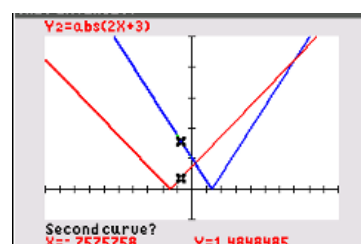
The GDC shows a cross on the curve and 'First curve?'.

Press **enter**.



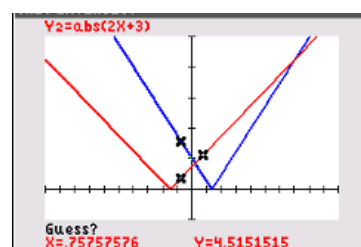
The GDC shows a cross on the line and 'Second curve?'.

Press **enter**.

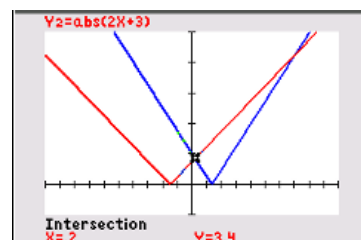


The GDC requires an initial guess for the position of the intersection. Choose a point close to the first intersection by moving the cursor with the **◀** **▶** keys.

Press **enter**.



The GDC displays the first intersection at (0.2, 3.4).



Repeat for the second intersection.

The GDC an intersection at (7,17).

The solutions are $x = 0.2$ and $x = 7$.

