

## Chapter 3 / Example 2

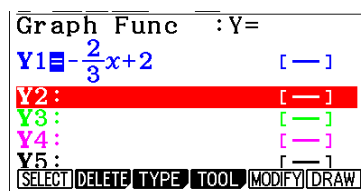
# Intersections of lines

- Find the coordinates of the x and y intercepts for the graph of  $2x + 3y - 6 = 0$ .
- Write the following equation in general form,  $y = x - \frac{1}{2}$ .
- Find the point of intersection of the two lines i analytically ii using an appropriate application on your technology.

In order to graph the function  $2x + 3y - 6 = 0$  you must first rearrange it in the form  $y = -\frac{2}{3}x + 2$ .

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

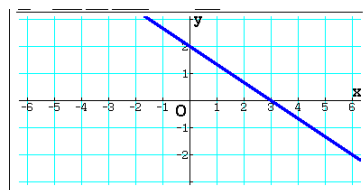
Type  $-\frac{2}{3}x + 2$  and press **EXE** to enter the first equation as Y1.



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

The GDC displays the graph  $Y1 = -\frac{2}{3}x + 2$ .

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

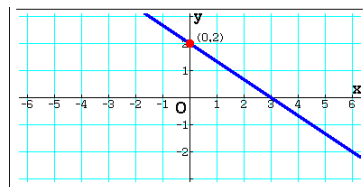


To find the y-intercept press **F5** G-SOLVE **F4** Y-ICEPT.

Press **EXE** to display the coordinates.

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

The GDC displays the coordinates of the y-intercept.  $(0, 2)$ .



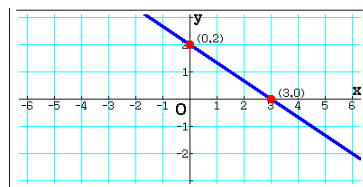
The x-intercept is a zero of the function.

To find the zero, press **F5** G-SOLVE **F1** ROOT.

The GDC shows the zero.

Press **EXE** to display its coordinates.

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



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# Intersections of lines

To draw the line  $y = x - \frac{1}{2}$  press **EXIT** to display the equation entry screen.

Type  $x - \frac{1}{2}$  and press **EXE** to enter the second equation as Y2.

Use  **$\frac{\Box}{\Box}$**  to enter the fraction.

Graph Func : Y=

Y1 =  $-\frac{2}{3}x + 2$  [—]

Y2 =  $x - \frac{1}{2}$  [—]

Y3 : [—]

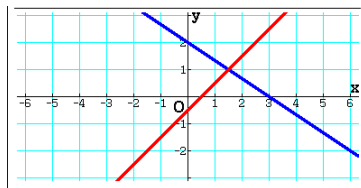
Y4 : [—]

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

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

The GDC now displays the straight-line graphs:

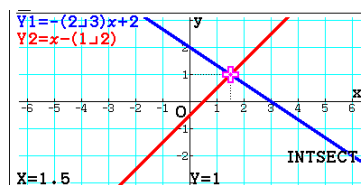
$Y1 = -\frac{2}{3}x + 2$  and  $Y2 = x - \frac{1}{2}$  with the default axes.



To find the intersection press **F5** G-Solv **F5** Intersect.

Press **EXE** to display the coordinates.

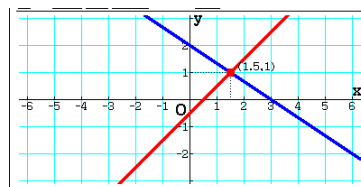
Press **EXIT** to leave G-Solv mode and **F6** DRAW to display the graph screen again.



Press **EXE** to display the coordinates.

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

The GDC displays the intersection of the two straight lines at the point  $(1.5, 1)$ .



Rearrange the equations as  $2x + 3y = 6$  and  $2x - 2y = 1$ .

Solve these simultaneous equations to find  $x$  and  $y$ .

Press **MENU** **A** **EQN** to enter equation mode.

Press **F1** Simultaneous.

There are 2 unknowns so press **F1** 2.

Simultaneous

No Data In Memory

Number Of Unknowns?

2 3 4 5 6

Enter to coefficients into the matrix.

Press **F1** SOLVE.

$a_n X + b_n Y = C_n$

	a	b	c
1	2	3	6
2	2	-2	1

1

[SOLVE] [DELETE] [CLEAR] [EDIT]

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The GDC shows the solution is (1.5,1) as before.

$$a_n X + b_n Y = C_n$$

X	1.5
Y	1

REPEAT

$$\frac{3}{2}$$