

Chapter 3 / Example 2

Intersections of lines

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

Open a new document and add a Graphs page.

The entry line is displayed at the top of the work area.

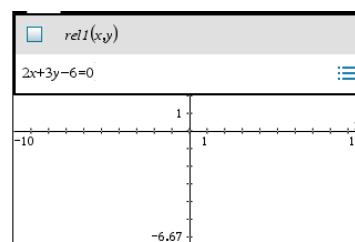
The default graph type is function, so ' $f1(x)=$ ' is displayed.

The default axes are $-10 \leq x \leq 10$ and $-6.67 \leq y \leq 6.67$.

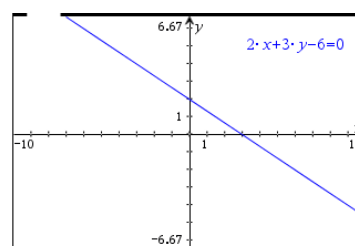
Press **menu** 3:Graph Entry/Edit | 2:Relation.

The graph type is relation, so ' $rel1(x,y)$ ' is displayed.

Type $2x + 3y - 6 = 0$ and press **enter**.



The GDC displays the first straight-line graph $2x + 3y - 6 = 0$.

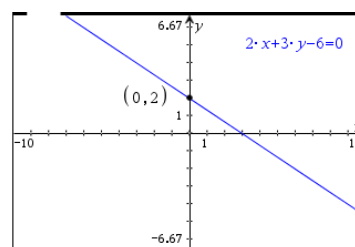


To find the y-intercept press **menu** 5:Trace | 1:Graph Trace.

Press **0** **enter** to change the x coordinate to 0.

Press **enter** again and then press **esc** to leave the graph trace mode.

The GDC displays the coordinates of the y-intercept.



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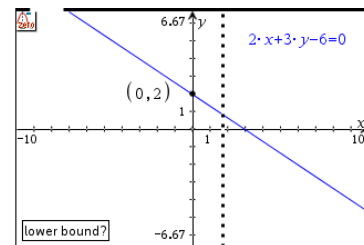
To find the zero (x-intercept) press **menu** 6:Analyse Graph | 1:Zero.

You will need to give the lower and upper bounds of the region that includes the zero.

The GDC shows a line and asks you to set the lower bound. Move the line using the touchpad and choose a position to the left of the zero.

Click the touchpad.

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

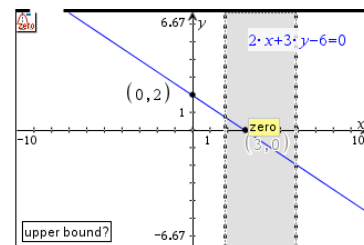


The GDC shows another line and asks you to set the upper bound.

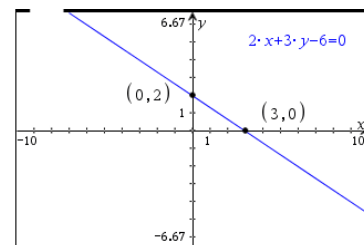
Use the touchpad to move the line so that the region between the lower and upper bounds contains the zero.

When the region contains the zero, the calculator will display the word 'zero' in a box.

Click the touchpad.



The GDC displays the x-intercept at $(3, 0)$.

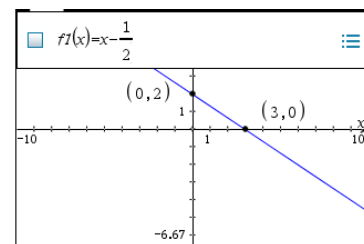


Press **menu** 3:Graph Entry/Edit | 1:Function.

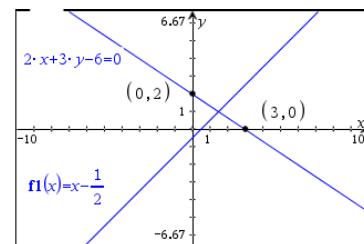
The graph type is function, so $f1(x)=$ is displayed.

Type $x - \frac{1}{2}$ and press **enter**.

Press **ctrl** $\left[\frac{\square}{\square}\right]$ to use the fraction template.



The GDC displays the second straight-line graph $f1(x) = x - \frac{1}{2}$.



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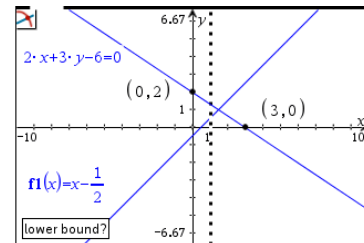
Intersections of lines

Press **menu** 6:Analyse Graph | 4:Intersection.

To find the intersection you need to give the lower and upper bounds of the region that includes the intersection.

The GDC shows a line and asks you to set the lower bound. Move the line using the touchpad and choose a position to the left of the intersection.

Click the touchpad.

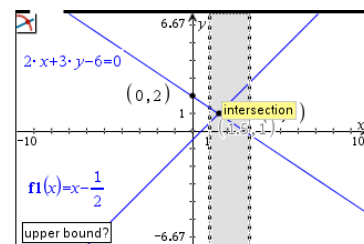


The GDC shows another line and asks you to set the upper bound.

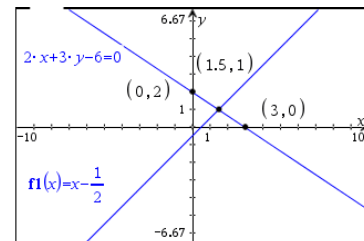
Use the touchpad to move the line so that the region between the lower and upper bounds contains the intersection.

When the region contains the intersection, the calculator will display the word 'intersection' in a box.

Click the touchpad.



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



To find the intersection using the simultaneous equation solver Press **ctrl** **doc** (**+page**) and add a new Calculator page.

Press **menu** 3:Algebra | 2:Solve System of Linear Equations...

Select 2 equations and x and y as the variable names separated by a comma.

Type in the two equations in the template and press **enter**.

The GDC shows the solution is $\left(\frac{3}{2}, 1\right)$ as before.

