

## Simultaneous Equations on a CASIO *fx-7400G PLUS*

**Example** To find the solutions of  $2x - y = 20$   
 $x + 5y = 100$

First **write both equations in the form  $y = \dots$**

In this case the equations become  $y = 2x - 20$   
 $y = (100 - x) \div 5$

- On the **MENU** select **GRAPH** (i.e. 4)
- The coordinates given below will give a good display of the graph. To enter these press **SHIFT F3 (V-Window)**.

<b>V-Window</b>
<b>Xmin:</b> 0
<b>max:</b> 50
<b>scl:</b> 10

<b>V-Window</b>
<b>Ymin:</b> (-) 20
<b>max:</b> 30
<b>scl:</b> 10

Press **EXE** after each entry for X then ▼ on the **REPLAY** key to go to the Y menu.

Press **EXE** after each entry for Y then **EXE** again to enter the equations.

- **Enter the equations**

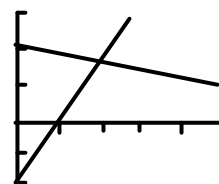
(Y1:)  $2X - 20$

(Y2:)  $(100 - X) \div 5$

Use the **X,T** button for X.

Press **EXE** after each equation.

- Press **F4** **DRAW** and the calculator should draw the graph as shown.



- Press **SHIFT F1** **TRACE**

A cursor should appear at the top of the first line (under the equation). Its coordinates are given at the bottom of the screen.

- **Try pressing the horizontal arrow keys** ◀ ▶ (on the **REPLAY** key) These make the cursor move along the line.

**Then try pressing the vertical arrow keys** ▲ ▼ These make the cursor move from one line to the other.








Moving the cursor to where the lines cross gives a rough estimate of the  $x$  and  $y$  values i.e. the solution of the equations.



Much better estimates can be found by using **Zoom** to enlarge the graph near the point of intersection.

- Press **SHIFT F2** 

Four options are given at the bottom of the screen - in this case we will use **BOX**. (IN and OUT use a fixed scale factor which can be set using FACT.)

- Press **F1**  - a cursor should appear in the middle of the screen.
- Press   (on the REPLAY key) to move the cursor to a point just below and to the left of the point of intersection.
- Press  - this fixes a corner of the box.
- Press   to **draw a box around the point**, then press  **again**.

The calculator will display an enlarged graph of this part of the graph.

- Use **Trace** to get a better estimate of the  $x$  and  $y$  values at the point of intersection.

**Note** You can use the **BOX** option to zoom in more than once.

By doing this you can find very accurate estimates of the solutions.

In this case the exact solutions (from algebra) are  $x = 18.1\bar{8}$  and  $16.3\bar{6}$ .

See how near you can get to these values using the graphic calculator.

### Choosing Coordinates

In this example you were given the coordinates to use for the graph's axes.

In other cases you may find it difficult to decide which values to use.

If initially you choose values that are unsuitable because they do not show the point of intersection of the graphs, try one or both of the following:

- Use the **arrow keys on the REPLAY button** to **move the graph** around until you find the point of intersection.
- Use the **OUT option on the ZOOM menu** to zoom out until you find it.

