

Chapter 3 / **Example 1****Equation of a straight line**

For the two points A(2, 2) and B(6, 1)

- Find the gradient m of (AB) (the line passing through A and B).
- Find the equation of (AB) in the form $y = mx + c$.
- Sketch the line for $-2 \leq x \leq 12$.
- Find:
 - the value of y when x is 4.7
 - y -intercept.

Press **MENU** 2 **STAT** to display the List Editor screen.

Enter the x -coordinates of the two points in the first column.

Press **EXE** after each number to move to the next cell.

	List 1	List 2	List 3	List 4
SUB				
1	2			
2	6			
3				
4				

GRAPH CALC TEST INTR DIST **▶**

Press **▶** to move to the next column.

Enter the y -coordinates of the two points in the second column.

	List 1	List 2	List 3	List 4
SUB				
1	2	2		
2	6	1		
3				
4				

GRAPH CALC TEST INTR DIST **▶**

Press **F1** GRAPH.

Press **F6** .SET.

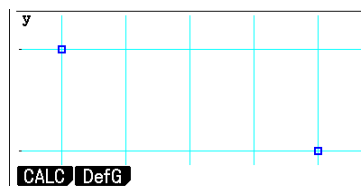
Choose Graph Type: **F1** Scatter, XList: List1 and YList: List2.

StatGraph1	
Graph Type	: Scatter
XList	: List1
YList	: List2
Frequency	: 1
Mark Type	: <input type="checkbox"/>
Color Link	: Off
[GRAPH1][GRAPH2][GRAPH3]	

Press **EXIT**.

Press **F1** GRAPH1.

The GDC displays the points A and B.



To find the equation of the line through A and B, calculate the equation of the regression line. Press **F1** CALC, **F2** X, **F1** $ax+b$

The form of the regression equation is ' $y = ax + b$ '.

The equation of the line is $y = -0.25x + 2.5$.

LinearReg(ax+b)	
a	= -0.25
b	= 2.5
r	= -1
r ²	= 1
MSe	=
y=	ax+b
COPY DRAW	

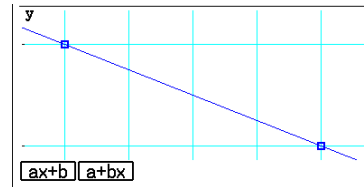
Chapter 3 / **Example 1****Equation of a straight line**

Press **F5** COPY.

The GDC displays the equation entry screen.

Press **SHIFT** **9** PASTE and press **EXE**.

Press **F6** DRAW.



The required range for the y -axis can be found from the table function.

Press **MENU** 7 **TABLE**.

Press **F1** SELECT.

Press **F5** SET and change the settings so that the table starts from -2 and ends at 12 .

Press **EXIT**.

Table Setting

X

Start: -2
End: 12
Step: 1

Press **F6** TABLE.

A table of values is displayed.

From the table, you can see that the largest value of y in the domain $-2 \leq x \leq 12$ is 3 .

X	Y1
-2	3
-1	2.75
0	2.5
1	2.25

Scrolling down the table using **▼** you can see that the smallest value of y is -0.5 .

X	Y1
9	0.25
10	0
11	-0.25
12	-0.5

Use this information to choose suitable window settings to display the graph.

Press **MENU** 5 **GRAPH** **PAUSE**.

Press **F1** SELECT.

Press **SHIFT** **F3** V-WIN.

Change the settings to show $-2 \leq x \leq 12$ and $-0.5 \leq y \leq 3$.

You can leave the other items as they are.

Press **EXIT** when you have finished.

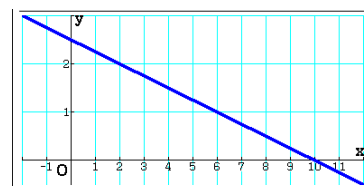
View Window

Xmin: -2
max: 12
scale: 1
dot: 0.03703703
Ymin: -0.5
max: 3

INITIAL TRIG STANDARD V-MEM SQUARE

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

The GDC shows the straight line in a window that corresponds to the given domain and range.



Chapter 3 / **Example 1****Equation of a straight line**

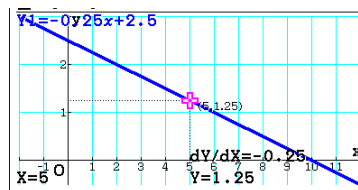
Press **EXIT** then press **SHIFT** **MENU** SET UP.

Scroll down to Derivative with **▼** and use **F1** to set this to 'On'. Press **EXIT** to return to the equation entry screen and **F6** DRAW to return to the graph.

```
Input/Output:Math
Draw Type    :Connect
Ineq Type    :Union
Graph Func    :On
Dual Screen  :Off
Simul Graph  :Off
Derivative    :On
On Off
```

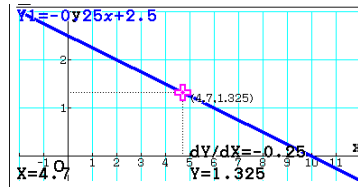
To find the gradient of the line press **F1** Trace.

The GDC displays a point on $y = -0.25x + 2.5$ and the gradient at that point, which is -0.25 .



To find the value of y when x is 4.7 type 4.7 and press **EXE**.

The GDC displays the coordinates of the point $(4.7, 1.325)$.



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

Press **EXE** to display the coordinates.

The GDC displays the coordinates of the y -intercept $(0, 2.5)$.

