

Year 10 Alternative is a course for weak students who normally have great difficulty with concepts associated with the graphs of linear functions. This includes finding and plotting points, finding the x and y intercepts and the gradient, sketching graphs.

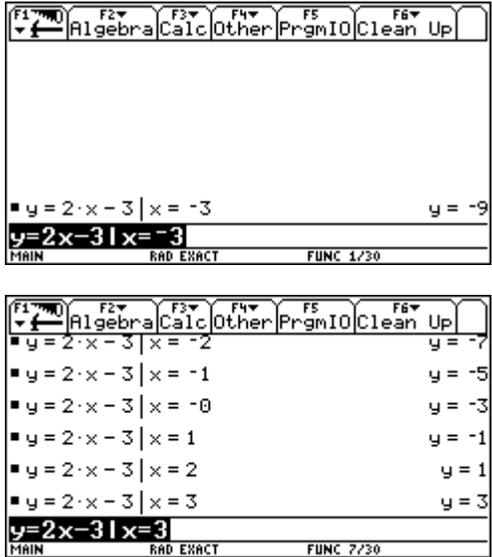
note: Unless otherwise stated, TI-92 infers both the TI-92 and TI-92 Plus. TI-92 Plus refers only to this type of calculator.

Objective: To help improve students’ understanding of the concepts associated with linear functions and the associated graph.

- Finding and plotting points

Task: Complete the following table of values for the equation $y = 2x - 3$, for $x = -3, -2, -1, 0, 1, 2, 3$.

- Using the TI-92 to find the y values:

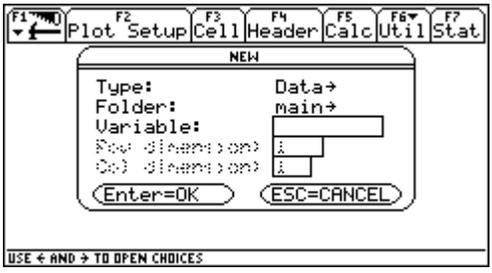
<p>Home screen $y = 2x - 3 \mid x = -3$ $y = 2x - 3 \ 2^{nd}$, k, $x = -3$ enter</p> <p>Likewise, find values for the other x values, which gives the following table:</p>	
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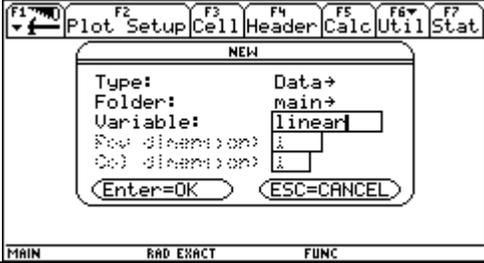
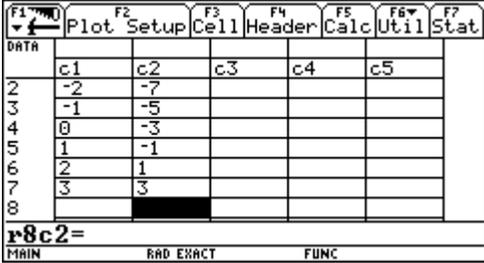
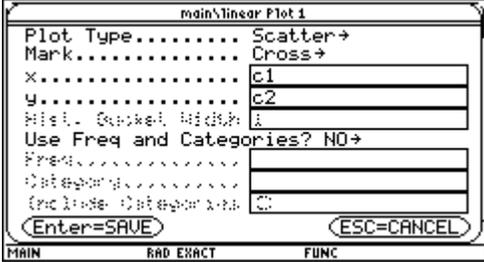
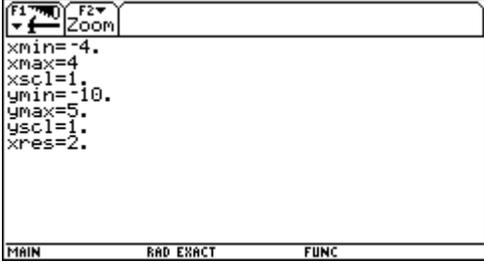
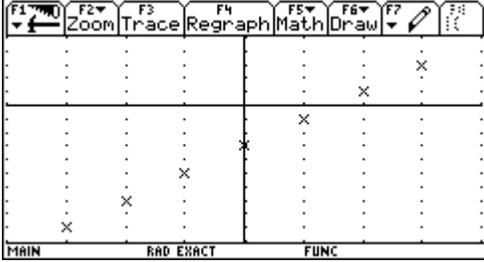
x	-3	-2	-1	0	1	2	3
y	-9	-7	-5	-3	-1	1	3

- At this stage, discussion about ‘difference between ‘ y values’ will lead to the concept of ‘gradient’.
- Observation of the y value when $x = 0$ will identify ‘ y intercept’.

- Plotting the points

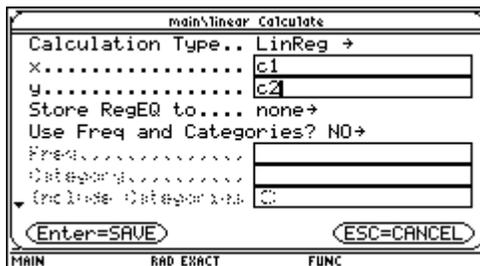
Students should plot points manually on graph paper and then use the **Data/Matrix Editor** to plot the points as a **Scatter plot** on the TI-92.

<p>APPS, 6, 3(new) will access the Data/Matrix Editor dialogue box.</p>	
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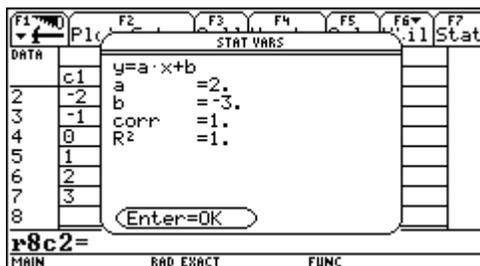
<p>Under variable type 'linear', enter, enter</p>	
<p>Enter the data as shown</p>	
<p>F2, F1 accesses this dialogue box, which will plot the points as a 'scatter plot' using 'crosses' for each point. press enter, enter</p>	
<p>Set Window to $x \in [-3,3]$ and $y \in [-10,5]$</p>	
<p>To graph the points, press ♦, Y= with 'Grid On' (F1, 9, Grid, On). 'Grid on' allows students to check coordinate points.</p>	

iii. Finding **Regression line** to these plotted points

Return to **Data/Matrix Editor**
 Select **F5, LinReg, c1, c2** enter enter



Read off values for gradient - 'a' and y intercept - 'b'



This confirms the original graph.

Student Exercises:

Students should repeat this activity with several types of graphs, with both positive and negative gradients, looking for the patterns between the equation and its graph to establish *m* and *c* as the gradient and y intercept.