Seeing My ABs
Algebra 1

In this investigation we will explore plotting points for Linear Functions and then examining the Slope (A) and the Y-Intercept (B).

Linear Functions come in the form of y = A*x + B.

The Slope is the ratio of the change in y-values divided by the change in x-values. If you have two points on a line (**D**,**E**) and (**I**,**J**) the Slope (which is a measure of the tilt of the line) would be calculated from the following formula:

$$Slope = \frac{J - E}{I - D} = \frac{\Delta y}{\Delta x}$$

The Y-Intercept can be determined simply by letting the x-value equal zero and calculating the y-value, which is the Y-Intercept.

1. For the given expression, find 5 values that satisfy. That is, pick 5 values for x and calculate the resulting y-values. Place these in a Table.
2. Plot these points and connect them with a straight line on the quarter of a graph paper. Make sure that you select an appropriate scale for x and y.
3. Determine the Slope and Y-Intercept from the graph.
4. Calculate the Slope and Y-Intercept from the formulas above.
5. Identify these values in the given expression.

$$\text{1. } 16x - 9 = y$$

$$\text{2. } 7x - 8 = y$$

$$\text{3. } 12x - 4 = y$$

$$\text{4. } 5x + 6 = y$$

$$\text{5. } (-4 + x)10 = y$$

$$\text{6. } (-6x - 2)4 = y$$

$$\text{7. } 3x = y$$

$$\text{8. } \frac{2}{3}(24x - 9) = y$$

Now let us check our work with the TI.

A. Enter your equation in the **o** editor. Just use the side with the x value.
B. Set your **p** with the same values, and scale used on your paper graph.
C. Set the **y** [TblSet] option as shown below.

```
TABLE SETUP
 TblStart=0
 ⊿Tbl=1
Indpnt: Auto Ask
Depend: Auto Ask
```

D. Now check the values from your table, with the **y** [TABLE] on the calculator.
E. Look at the **s** based on your **p**, and compare to your paper graph.
F. Now let the computer do the setting. Go to the **p** screen and set the **Xmin** and **Xmax** to the minimum and maximum values used on your table. Now select **ZoomFit** from the **q** options.
G. Examine this graph and compare to the graph you have. Return to the **p** and compare with the setting used in part B.
H. Identify the Y-Intercept and the Slope from your graph by using options **1:value** and **6:dy/dx** from the **CALCULATE** menu using **y** [CALC]. Note that your line must cross the y-axis if you are to locate the Y-Intercept.

```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```
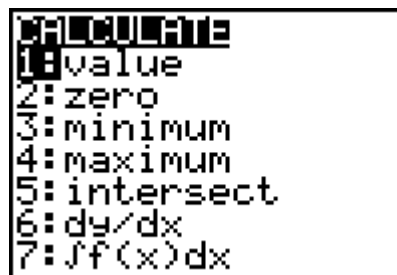
I. Simplify the last 4 equations to get the Linear form y = A*x + B and compare these values for Slope (A) and the Y-Intercept (B) with those that you discovered on paper and the calculator.