## Best Fit Line on the Calculator

Often, an instructor will ask a student to figure out a best fit line by choosing two "good" points and calculating the $m$ and the $b$ by hand. In the previous handout, we figured out that

| $x$ | -2 | -1 | 0 | 1 | 2 | 3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $y$ | 5 | 6 | 2 | 1 | -3 | -5 |

could be modeled with the equation $y=-\frac{3}{2} x+2$, but that it doesn't look like it's the best line possible. Leaving the data in the list editor we can have the calculator calculate the best fit line.

Press STAT, then arrow the cursor to the right so that it's in the CALC column and press 4 for the linear regression option. Notice that it gives the formula in $a x+b$ form, when we are used to $m x+b$ form. No problem, the $a$ that it calculates will be the slope. Press ENTER and you should see the following on the home screen:


The calculator is saying that the best fit line for this data (with the slope and " $b$ " rounded to 2 decimal places) is $y=-2.23 x+2.11$. Enter this equation into the $\mathrm{Y}=$ screen and press GRAPH to see how good it is:


The " $r$ " is called the "correlation coefficient and tells us how linear the data is. The closer $r$ is to 1 (or to -1 if the points are going down instead of up), the closer to exactly linear the data is. Our $r$-value of -0.96 means the data is going down, and is fairly linear.

