Example: Using Statistics

Note: You must be using the paid version 2.0.0 or later to use statistics.

Problem: Use the following data points to calculate statistics

x	y
1	6
2	5
3	7
4	10

Step 1:

Push the (x, y) data points to the stack as (real, imaginary) using the y+xi button

Step 2:

Select the 1+6i line on the stack and choose stat$_n$► on Pg 2/2 of the selection toolbar. The four points will be used to calculate the following statistics:

Label	Location	Description	Value
Σx	x ▼	Sum of x values	10.
Σy	y ▼	Sum of y values	28.
Σx²	x ▼	Sum of squared x values	30.

Σy^2	y ▼	Sum of squared y values	210.
$\bar{x}$	x ▼	Average of x values	2.5
$\bar{y}$	y ▼	Average of y values	7.
σx	x ▼	Standard deviation of x	1.118
σy	y ▼	Standard deviation of y	1.871
n	xy ▼	Number of data points	4
Σxy	xy ▼	Sum of products of x and y. (Also weighted sum.)	77.
$\bar{x}_w$	xy ▼	Average of x values, using y values as weights	2.75
σx_w	xy ▼	Standard deviation of x, using y values as weights	1.153

Helpful Hints:

You can long-press 0 to perform a y+x*i*.

Statistics are calculated as soon as you press $stat_n$►, and will not change until you press $stat_n$► again. You can modify or delete the data points on the stack, add more calculations to the stack, etc. and it will not affect the statistics.

The statistics toolbar will not go away until you hit ◄Exit. For instance, you can show the cos toolbar by pressing the green cos button, but when you press the green cos button again, you will go back to the statistics toolbar instead of turning the toolbar off. Once you press ◄Exit, the statistics you calculated are deleted; there is no way to recover them.

Step 3:

Press reg▼ to calculate regression formulas for the data points. You will be provided four regression models to fit the data: a+bx, a+ln x, $a \cdot x^b$, and $a \cdot b^x$. We can try each model and check its r^2 value to see how well that model matches our data. We find that a+bx is our best match, with an r^2 of 0.7, and $a \cdot b^x$, is a close second with an r^2 of 0.672.

Step 4:

Press a+bx▼ to process the data as a linear regression. We find that a = 3.5 and b = 1.4. So, our best fit line is y=3.5+1.4x. We can now send this equation to macro mode. Press →macro and Acron RPN will automatically generate a macro of $3.5+1.4 \cdot 0$, with the 3.5 and 1.4 frozen. Now we can enter various x values and see the projected y values. Hit OK to exit macro mode.

You can also long-press →macro to generate the inverse macro. Now you can enter various y values and see the projected x values. Hit OK to exit macro mode.

Step 5:

Go back and press $a \cdot b^x$▼ to process the data as an exponential regression. We find that a = 4.243 and b = 1.206. So, our best fit curve is $y=4.243 \cdot 1.206^x$. We can now send this equation to macro mode. Press →macro and Acron RPN will automatically generate a macro of $4.243 \cdot 1.206^0$, with the 4.243 and 1.206 frozen. Now we can enter various x values and see the projected y values. Hit OK to exit macro mode.

You can also long-press →macro to generate the inverse macro. Now you can enter various y values and see the projected x values. Hit OK to exit macro mode.