Following complex instructions

The data is: 95, 97, 100, 109, 103, 97, 112

First stage

1. Find the total of all the data items
2. Divide the answer to step 1 by the number of data items
3. Round the result to one decimal place

Second stage

1. Take a piece of paper and make three columns
2. In the first column, write each data item, one to a row
3. In each row of the second column, record the result of subtracting the result of step 3 of the first stage from the data item in that row of the first column. Ignore the sign of the answer
4. In the third column, record the result of squaring each of the numbers in the second column. Squaring is the same as 'multiplying the number by itself' so 3 squared is 9
5. Add up the numbers in the third column
6. Divide the answer to step 5 by *one less than* the number of data items
7. Take the square root of the result of step 6. The square root of 16 is 4, and the square root of 25 is 5. The square root symbol looks like √. Round off the answer to one decimal place.

What is it all about?

The result of the first stage is called the arithmetic **mean**, and is one of the *many* kinds of average in common use. More sophisticated terms for average are '**measure of central tendency**' or 'measure of location'. The idea is that the measure of central tendency tells you something about a '**typical value**' for the data, it 'stands for' all the separate data items in some way.

The result of the second stage is called the **sample standard deviation** for the data. This number tells you something about how spread out the data is. Two sets of data could have roughly the same mean, but very different standard deviations. The data set with the largest standard deviation has *more variability* than the data set with a smaller standard deviation. The data set with the smaller standard deviation is *more consistent* than the data set with the larger standard deviation. A more sophisticated term for 'number that says how spread out the data is' is '**measure of dispersion**'.

Step 6 of the second stage involves dividing the total of the sum of the squares of the differences from the mean by *one less* than the number of results. You may find textbooks where they divide by just the number of results. That alternative instruction leads to the **population standard deviation**. We will look at the differences between the two definitions later on.

PS: I am preparing slightly less pompous recipes for all the statistical formulas you need to know.