

Data to help you learn to use your calculator.

The following data is classified as single variable statistics.

Example Data

Distance (cm)

60.25

60.20

60.23

60.21

60.24

Average or mean = 60.226 cm = 60.23cm

Standard deviation = 0.021 cm = 0.02 cm

Standard deviation of the mean = 0.009 cm = 0.01 cm

The answer for the average (mean) is 60.226 cm. As the data has two numbers after the decimal point, it is entered as 60.23 cm in the lab report. You would use 60.226 cm for any additional calculation which uses the mean (average) value. It is always a good idea to keep the extra digit to reduce rounding off errors.

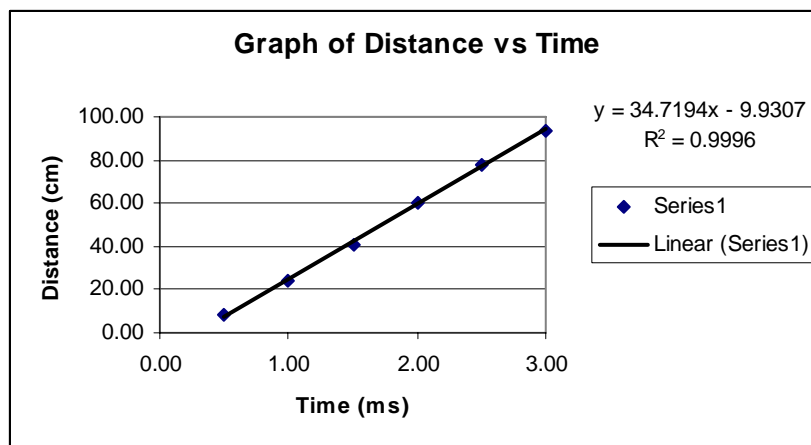
The standard deviation is 0.021 cm and is rounded off to 0.02 cm for the lab report. Naturally, 0.021 cm would be used for any additional calculations. **Please note.** If you got a standard deviation of 0.0185 cm, and not 0.0207 cm, you used the wrong symbol (function) to calculate the standard deviation. For most calculators, it is s_x or σ_{n-1} . It is not σ_x or σ_n . The standard deviation uses (N-1), not (N), in the formula when calculated.

The standard deviation of the mean (SDM) is not generally calculated by the statistical functions on a calculator. To calculate the SDM, you simply divide the standard deviation by the square root of the number of samples. Here, it is the square root of 5. The SDM is also referred to as the standard error.

The following data is classified as linear and of the form of $Y = mx + b$.

Example Data

Time (ms)	Distance (cm)
0.50	8.02
1.00	24.40
1.50	41.10
2.00	60.11
2.50	77.41
3.00	93.93



The Excel graph is here as an aid. You do an Excel graph in class, but for your lab reports and test, you will be asked to do a graph by hand and to do linear regression on your calculator. Both will be used to generate information of the form $Y = mx + b$.

Entering time and distance into a calculator, we have:

Slope m = 34.719 cm/ms = 34.72 cm/ms

Intercept b = -9.931 cm = -9.93cm

Correlation Coefficient R^2 = 0.9996

Note that some calculators use $Y = ax + b$ or $Y = bx + a$. You have to learn what is correct for your calculator.

The correlation coefficient should always be entered with four numbers after the decimal point. The closer this value is to 1, the more linear is the data. Please note that some experiments will indicate the amount of numbers to enter after the decimal point for data as slope and mean.