Significant digits
The number of digits in a measurement indicates how precise the measurement is. The number of significant digits in a number is not the same as the number of decimal places. For example, both 14.1 and 0.000141 have three significant digits. Zeroes to the left of the number are not significant; zeroes to the right of the number are significant. Therefore 0.00025 has two significant digits and 25.00 has four. The last digit in any measurement is usually uncertain. The instructions in the manual will specify how precise your measurements should be.

There are two different rules to follow when you are doing arithmetic; one is used for addition and subtraction while a separate rule is used for multiplication and division.

Addition and Subtraction
When you add or subtract, the precision of the answer is determined by the least precise measurement.

For example:

$$\begin{array}{r} 11.382 \\ 5.96 \\ +\ 248.0042 \\ \hline 265.3462 \end{array}$$

5.96 is the least precise measurement therefore the sum should be rounded to 265.35. The answer should be rounded, not truncated.

Multiplication and Division
When you multiply, divide, use trig functions powers or roots, the answer should have as many significant digits as the measurement that has the least.
For example:

$$\sin 16° = 0.28, \quad \text{but} \quad \sin 16.0° = 0.276$$

and

$$(2.2)^2 = 4.8, \quad \text{but} \quad (2.20)^2 = 4.84.$$

$$\begin{array}{r} 3.14159 \\ \times\ 2.54 \\ \hline 7.979639 \end{array}$$

This final answer should be rounded to three digits, *7.98*.

$$\frac{3.22}{14.673} = 0.219$$

The final answer can only have three significant digits.

Exact integers are considered to have an infinite number of significant digits.
For example:

$$r = \frac{d}{2} = \frac{5.228}{2} = 2.614$$

The final answer will have four significant digits.

When you do an involved calculation, carry out all the arithmetic and then round the final answer. If you round your values before you reach the final answer rounding errors may accumulate.

Slopes and Intercepts

The equation for the least squares slope is:

$$m = \frac{N\left(\sum x_i y_i\right) - \left(\sum x_i\right)\left(\sum y_i\right)}{N\left(\sum x_i^2\right) - \left(\sum x_i\right)^2}.$$

The y-intercept is given by

$$b = \overline{y} - m\overline{x}.$$

Because of the summations the slope can usually have one or two more significant digits than an individual data point.

This is also true of the y intercept, but it should be kept to the same precision as the y data.

Units

The units of the slope are the y unit over the x unit. The intercept has the same unit as the y values on the graph.