

Significant Digits

When a measurement is taken, we usually read as many accurate digits as possible, then estimate the final digit. These measured digits, including the estimated one, are called significant.

The number of significant digits in a value is determined in the following manner:

- All counted quantities are exact.
- All measured quantities have some degree of error.
- All non-zero digits are significant.
e.g. 296.67 --> 5 significant digits
- All zeros between non-zero digits and trailing zeros to the right of a decimal point are significant.
e.g. 606 and 7.00 --> 3 significant digits
- In whole numbers, all trailing zeros (those to the right of the last non-zero digit) are not considered significant unless, by inspection of the measured quantity, the number of significant digits can be assessed.
e.g. 350 km on the odometer --> 3 significant digits
 but 350 km alone --> 2 significant digits
- In decimal fractions smaller than 1, leading zeros (to the left of the first non-zero digit) are not significant.
e.g. 0.003 68 --> 3 significant digits

Calculations involving measured quantities:

When adding or subtracting measured quantities, the answer should be expressed to the same number of decimal places as the least precise quantity used in the calculation.

When multiplying, dividing, or finding the square root of measured quantities, the answer should have the same number of significant digits as the least precise quantity used in the calculation (depends on sig. digits).