Significant Figures - Part I

How significant figures relate to the experimental measurement and how to mathematically manipulate significant figures.

Definitions and recognizing least significant digit from the written number -PART I

Significant Figures

An introduction:

What are significant figures (digits)?

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(more or less)

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In every-day expression, such as in the newspaper, when one come across a number such as:

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one does not normally take the last 6 “0"s as literally meaning 12 million dollars to the very last dollar.

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Likewise, when one sees a measurement such as 4", one usually assumes that the value is good to at least 1/8", otherwise one would have written it so.

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where the last "0" indicates the quantity is known to the 1×10^{5} dollar.

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The last “0” indicates that the number is known to the nearest 0.01.

Significant Figures, an introduction:

Thus, all the digits in scientific writing have meaning, unlike the popular method of writing numbers.

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For example:

Reading = 1.1 m
Actually = 1.2 m

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Reading = 1.1 m
Actually = 1.2 m

Difference = 0.1 m

So, 0.1 m is the error in accuracy

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Example: 3 measurements:

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1.02 m
1.00 m

So, the precision is about ± 0.01 m

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“relative precision” the absolute precision divided by the measurement itself to yield a dimensionless quantity. Sometimes it is expressed as a percent.

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for: 5.70×10^{-4} it is the "0" (or 0×10^{-6})

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THE END of PART I
go on to
PART II