Lect. 1

Units and Dimensions

Physics:

Physics is an experimental science depends on measurements. Measurements is about quantities and the dimensions of these quantities.

Quantities in physics are:

Scaler:

have value only

for example:

mass

Vector:

have value and direction

for example:

velocity

Basic quantities in physics:

Mass (M)
Length (L)
Time (T)

Units systems in Physics:

there are many unit systems in physics the most important are:

CGS system (English system):

Mass ----------›gram (gm)
Length ----------›Centimeter (Cm)
Time ----------›Second (S)

MKS system (Standard system):

Mass ----------->Kilo gram (Kg)
Length ----------->meter (m)
Time ----------->Second (S)

Derived quantities in Physics:

name	symbol	unit
Area	L^2	m^2
Volume	L^3	m^3
Force	mL/T^2	Kgm/S^2

Dimensional Analysis:

Units used in dimensional analysis to prove weather the physical equation is correct or not.

Example:

the equation $v = v_0 + at$

$$\frac{L}{T} = \frac{L}{T} + \frac{L}{T^2}T$$

$$\frac{L}{T} = \frac{L}{T} + \frac{L}{T}$$

so the equation is correct !