BADJI MOKHTAR UNIVERSITY -ANNABA
FACULTY OF TECHNOLOGY
SCIENCE AND TECHNOLOGY DEPARTMENT (ST)
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Physics 1: Series 1
Dimensional equations

Exercise 1

Write the dimensional equations of the following quantities and deduce their units in the international system (IS):

1. The momentum of $\vec{F}$: $\overrightarrow{\mathcal{M}}_{/O}(\vec{F}) = \vec{r} \wedge \vec{F}$
2. The angular momentum $\overrightarrow{\mathcal{L}} = \vec{r} \wedge \vec{P}$
3. The electric field $E = F/q$
4. The electric potential $V = E.l$

Exercise 2

Say which of these formulas are homogeneous:

$$E^2 - \frac{p^2c^2}{m} = m^4 \qquad\qquad E^2 = p^2c^2 + m^2c^4$$

E: energy, p: quantity of movement, m: mass and c: speed of light

Exercise 3

The frequency f of oscillation of a stretched string depends on the tension T, the linear mass density μ (mass per unit length), and the length L of the string.

Find the expression for f by assuming the form: $f = kT^a\mu^b L^c$.

(k is a dimensionless numerical coefficient).