Physics Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 1

Units and Dimensions

Units and dimensional analysis

BASE QUANTITIES (SI)

$$[M],\ [L],\ [T],\ [A],\ [K],\ [\text{mol}],\ [\text{cd}]$$

COMMON DIMENSIONS

$$F : [MLT^{-2}], \qquad E : [ML^2T^{-2}], \qquad P : [ML^2T^{-3}], \qquad p : [MLT^{-1}]$$

$$G : [M^{-1}L^3T^{-2}], \qquad h : [ML^2T^{-1}], \qquad \text{pressure: } [ML^{-1}T^{-2}], \qquad \eta : [ML^{-1}T^{-1}]$$

HOMOGENEITY

every term of a valid equation has the same dimensions

CHANGING UNITS

$$n_2 = n_1\left(\frac{M_1}{M_2}\right)^a\left(\frac{L_1}{L_2}\right)^b\left(\frac{T_1}{T_2}\right)^c$$

Errors and significant figures

ABSOLUTE AND RELATIVE ERROR

$$\Delta a_{\text{mean}} = \frac{1}{n}\sum|\Delta a_i|, \qquad \text{relative error} = \frac{\Delta a}{a}$$

SUM OR DIFFERENCE

$$Z = A \pm B \ \Rightarrow\ \Delta Z = \Delta A + \Delta B$$

PRODUCT, QUOTIENT, POWER

$$Z = \frac{A^pB^q}{C^r} \ \Rightarrow\ \frac{\Delta Z}{Z} = p\frac{\Delta A}{A} + q\frac{\Delta B}{B} + r\frac{\Delta C}{C}$$

SIGNIFICANT FIGURES

$$\times, \div : \text{least number of significant figures;} \qquad +, - : \text{least number of decimal places}$$

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