

Fundamental Physical and Mathematical Constants

Physical Constants

QUANTITY	SYMBOL	VALUE
Atomic mass unit (Dalton)	amu	1.661×10^{-24} g
Avogadro constant	N_A, L	6.0221367×10^{23} mol ⁻¹
Bohr magneton	μ_B	$9.2740154 \times 10^{-24}$ J T ⁻¹
Boltzmann constant	k	1.380658×10^{-23} J K ⁻¹
Electron mass	m_e	$9.1093897 \times 10^{-31}$ kg
Elementary charge	e	$1.60217653 \times 10^{-19}$ C
Faraday constant	F	9.6485309×10^4 C mol ⁻¹
Gas constant	R	8.314510 J mol ⁻¹ K ⁻¹ 8.314510×10^{-2} L bar mol ⁻¹ K ⁻¹ 8.20578×10^{-2} L atm mol ⁻¹ K ⁻¹ 6.2364 L Torr mol ⁻¹ K ⁻¹ 1.9872 cal mol ⁻¹ K ⁻¹
Gravitational constant	G	6.67259×10^{-11} m ³ kg ⁻¹ s ⁻²
Molar volume of ideal gas at STP	V_m	22.413996×10^{-3} m ³ mol ⁻¹
Neutron mass	m_n	$1.6749286 \times 10^{-27}$ kg
Nuclear magneton	μ_N	$5.0507866 \times 10^{-27}$ J T ⁻¹
Permeability of vacuum	μ_0	$4\pi \times 10^{-7}$ H m ⁻¹
Permittivity of vacuum	ϵ_0	8.85419×10^{-12} J ⁻¹ C ² m ⁻¹
Planck constant	h	$6.6260755 \times 10^{-34}$ J s
	\hbar	$4.13566743 \times 10^{-15}$ eV s
	$\hbar = h/2\pi$	$1.05457168 \times 10^{-34}$ J s
Proton mass	m_p	$1.6726231 \times 10^{-27}$ kg
Rydberg constant	R_∞	1.0973731534×10^7 m ⁻¹
Speed of light in a vacuum	c, c_0	2.99792458×10^8 m s ⁻¹
Standard acceleration of gravity	g	9.80665 m s ⁻²
Stefan-Boltzmann constant	σ	5.67051×10^{-8} W m ⁻² K ⁻⁴

Mathematical Constants

QUANTITY	SYMBOL	VALUE
Ratio of circumference to diameter of a circle	π	3.14159265359
Base of natural logarithms	e	2.71828182846
Natural logarithm of 10	ln 10	2.30258509299