

Physical Constants

Quantity	Symbol	Value ¹
Physical constants		
Ampere's law constant	k_m	$1.00 \times 10^{-7} \text{ N}\cdot\text{s}^2/\text{C}^2$
Avogadro's number	N_A	$6.022\,142 \times 10^{23} \text{ /mol}$
Boltzmann's constant	k	$1.380\,650 \times 10^{-23} \text{ J/K}$
Coulomb's law constant	k_e	$8.98 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$
Electric charge unit	e	$1.602\,176 \times 10^{-19} \text{ C}$
Faraday's constant	F	$9.648\,534 \times 10^4 \text{ C/mol}$
Gravitational constant	G	$6.672\,59 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$
Molar gas constant	R	$8.314\,472 \text{ J}/(\text{mol}\cdot\text{K})$
Planck's constant	h	$6.626\,068 \times 10^{-34} \text{ J}\cdot\text{s}$
Unified atomic mass unit	u	$1.660\,539 \times 10^{-27} \text{ kg}$
Mathematical constants		
Archimedes' constant (pi)	π	3.141 593
Pythagoras' constant ($2^{1/2}$)	$\sqrt{2}$	1.414 214
Napier's or Euler's constant	e	2.718 282
Empirical constants		
Speed of light in vacuum	c	$2.997\,925 \times 10^8 \text{ m/s}$
Speed of sound in air at 0°C	v_{sound}	331.0 m/s
Speed of sound in air at 20°C	v_{sound}	343.0 m/s
Acceleration due to Earth's gravity	g_{Earth}	9.806 65 m/s ²
Mass of Earth	m_{Earth}	$5.983 \times 10^{24} \text{ kg}$
Radius of Earth at equator	r_{Earth}	$6.378 \times 10^6 \text{ m}$
Rotational velocity of Earth	ω_{Earth}	$7.29 \times 10^{-5} \text{ rad/s}$
Orbital speed of Earth	v_{Earth}	29 770 m/s
Atmospheric pressure at sea level	p_{atm}	101.325 kPa (=1 atm)
Density of air (0°C and 1 atm)	d_{air}	1.293 kg/m ³
Density of water (4°C)	d_{water}	1000. kg/m ³
Freezing point of water	0°C	273.15 K

¹ Numbers in **boldface** are exact figures by international agreement.