Physical constants and general data

In addition to the numerical data given within the text of the individual problems, the knowledge of some general data and physical constants may be useful, and you may find them among the following ones. These are nearly the most accurate data currently available, and they have thus a large number of digits; you are expected, however, to write your results with a number of digits that must be appropriate for each problem.

Speed of light in vacuum: $c = 299792458$ m·s^{-1}

Magnetic permeability of vacuum: $\mu_0 = 4\pi \cdot 10^{-7}$ H·m^{-1}

Dielectric constant of vacuum: $\varepsilon_0 = 8.8541878$ pF·m^{-1}

Gravitational constant: $G = 6.67259 \cdot 10^{-11}$ m^3/(kg·s²)

Gas constant: $R = 8.314510$ J/(mol·K)

Boltzmann's constant: $k = 1.380658 \cdot 10^{-23}$ J·K^{-1}

Stefan's constant: $\sigma = 56.703$ nW/(m²·K^4)

Proton charge: $e = 1.60217733 \cdot 10^{-19}$ C

Electron mass: $m_e = 9.1093897 \cdot 10^{-31}$ kg

Planck's constant: $h = 6.6260755 \cdot 10^{-34}$ J·s

Base of centigrade scale: $T_K = 273.15$ K

Sun mass: $M_S = 1.991 \cdot 10^{30}$ kg

Earth mass: $M_E = 5.979 \cdot 10^{24}$ kg

Mean radius of Earth: $r_E = 6.373$ Mm

Major semiaxis of Earth orbit: $R_E = 1.4957 \cdot 10^{11}$ m

Sidereal day: $d_S = 86.16406$ ks

Year: $y = 31.558150$ Ms

Standard value of the gravitational field at the Earth surface: $g = 9.80665$ m·s^{-2}

Standard value of the atmospheric pressure at sea level: $p_0 = 101325$ Pa

Refractive index of air for visibile light, at standard pressure and 15 °C: $n_{air} = 1.000277$

Solar constant: $S = 1355$ W·m^{-2}

Jupiter mass: $M = 1.901 \cdot 10^{27}$ kg

Equatorial Jupiter radius: $R_B = 69.8$ Mm

Average radius of Jupiter's orbit: $R = 7.783 \cdot 10^{11}$ m

Jovian day: $d_J = 35.6$ ks

Jovian year: $y_J = 374.32$ Ms

π: 3.14159265