Formulas

$$v = \frac{d}{t}$$

$$d = v_0 t + \frac{1}{2} a t^2$$

$$v_f{}^2 = v_0{}^2 + 2ad$$

$$F = ma$$

$$p = mv$$

$$F = \frac{\Delta p}{\Delta t}$$

$$I = F\Delta t = m\Delta v$$

$$W = Fd\cos\theta$$

$$E_k = \frac{1}{2}mv^2 = \frac{p^2}{2m}$$

$$\Delta E_p = mg\Delta h$$

$$P = \frac{W}{t} = Fv$$

$$a = \frac{v^2}{r} = \frac{4\pi^2 r}{T^2}$$

$$P = \frac{F}{A}$$

$$q = mC_p\Delta \mathrm{T} = mL$$

$$\omega = \frac{2\pi}{T}$$

$$v = \pm\omega\sqrt{(x_0{}^2 - x^2)}$$

$$E_k = \frac{1}{2}m\omega^2(x_0{}^2 - x^2)$$

$$E_T = \frac{1}{2}m\omega^2 x_0{}^2$$

$$v = f\lambda = \lambda v$$

$$\frac{n_1}{n_2} = \frac{\sin\theta_2}{\sin\theta_1} = \frac{v_2}{v_1}$$

$$Ve = \frac{1}{2}mv^2$$

$$I = \frac{\Delta q}{\Delta t}$$

$$R = \frac{V}{I} = \frac{\rho L}{A}$$

$$P = VI = I^2 R = \frac{V^2}{R}$$

$$\varepsilon = I(R + r)$$

$$R_T = R_1 + R_2 + \ldots$$

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$$

$$F = G\frac{m_1 m_2}{r^2}$$

$$F = k\frac{q_1 q_2}{r^2}$$

$$F = \frac{q_1 q_2}{4\pi\varepsilon_0 r^2}$$

$$F = qvB\sin\theta$$

$$F = BIL\sin\theta$$

$$E = mc^2$$

Constants and Conversion Factors

Avogadro's Number = 6.022×10^{23}

Boltzmann's constant = 1.38×10^{-23} J K^{-1}

Coulomb's constant = 8.99×10^{9} N m^2 C^{-2}

Faraday constant = 96485 C/mol e^-

Gas law constant = 0.0821 atm L mol^{-1} K^{-1} = 8.314 J mol^{-1} K^{-1}

Gravitational constant = 6.67×10^{-11} N kg^{-2} m^2

Magnetic permeability = $4\pi \times 10^{-7}$ T m A^{-1}

Magnitude of electric charge = 1.60×10^{-19} C

Planck's constant = 6.626×10^{-34} J × s

Rydberg constant = 1.0974×10^{7} m^{-1}

Speed of light = 2.998×10^{8} m/s

Standard temperature and pressure is 0°C and 1 atm

At standard temperature and pressure, 1 mol of gas occupies 22.414 L

Stefan-Boltzmann constant = 5.6704×10^{-8} W m^{-2} K^{-4}

$m_{proton} = 1.673 \times 10^{-27}$ kg $m_{electron} = 9.109 \times 10^{-31}$ kg $m_{neutron} = 1.675 \times 10^{-27}$ kg

°F = 1.8(°C) + 32

K = °C + 273.15

Length
1 angstrom (Å) = 1×10^{-10} meters
1 inch = 2.54 centimeters
1 foot = 12 inches
1 meter = 3.2808 feet
1 yard = 3 feet
1 chain = 22 yards
1 furlong = 10 chains
1 mile = 5280 feet
1 mile = 1.609 kilometers
1 light year = 9.46×10^{15} meters
1 astronomical unit (AU) = 1.50×10^{11} m
1 parsec = 3.26 light years
1 degree = $\pi/180$ radians

Volume
1 gallon = 3.785 liters
1 gallon = 4 quarts
1 quart = 2 pints
1 pint = 2 cups
1 cup = 8 fluid ounces
1 fluid ounce = 29.575 mL

Mass/Weight
1 atomic mass unit = 1.6606×10^{-27} kilograms
1 ounce = 28.35 grams
1 troy ounce = 31.103 grams
1 pound = 16 ounces
1 kilogram = 2.2046 pounds
1 stone = 14 pounds

Pressure
1 atmosphere = 760 torr
1 atmosphere = 760 mm Hg
1 atmosphere = 101.325 kilopascals
1 atmosphere = 1013.25 millibars
1 atmosphere = 14.7 pounds per square inch (psi)

Energy
1 calorie = 4.184 J
1 eV = 1.602×10^{-19} J

Lide, David R. *CRC Handbook, 83rd ed.*; CRC Press: Boca Raton, Florida, 2004; inside back cover.