

Constants

Charge on electron, $e = -1.602 \times 10^{-19}$ Coulomb

Coulomb's constant, $k = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$

Mass of electron, $m_e = 9.11 \times 10^{-31} \text{ kg}$

Basic equations for charges and electric fields

Force between two charges

$$F = \frac{kqQ}{r^2}$$

F - Force, N; q, Q - charge, Coulombs; r - distance between charges, m

Field around a charge

$$E = \frac{kQ}{r^2}$$

F - Force, N; Q - charge, Coulombs; r - distance from charge, m

Force on a charge in an electric field

$$F = Eq$$

F - Force, N; q, Q - charge, Coulombs; r - distance between charges, m

Potential Energy of a charge in an electric field

$$PE = qEd$$

PE - Potential energy, J; q - charge, C; E - Field strength, N/C; d - distance, m