Chapter 21: Coulomb's Law

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General

Quantities

$$\begin{aligned}\vec{F} &= \text{electrostatic force}\\ q &= \text{point charge}\\ r &= \text{distance}\\ e &= \text{electron charge magnitude}\\ \epsilon_0 &= \text{vacuum permittivity}\\ k &= \text{Coulomb's law constant}\end{aligned}$$

Constants

$$\begin{aligned}e &= 1.60 \times 10^{-19}\,\mathrm{C}\\ \epsilon_0 &= 8.85 \times 10^{-12}\,\frac{\mathrm{C}^2}{\mathrm{N\,m}^2}\\ k &= \frac{1}{4\pi\epsilon_0} = 9.0 \times 10^{9}\,\frac{\mathrm{N\,m}^2}{\mathrm{C}^2}\end{aligned}$$

1 Coulomb's Law

$$F = \frac{1}{4\pi\epsilon_0}\frac{|q_1|\,|q_2|}{r^2} = k\frac{|q_1|\,|q_2|}{r^2} \tag{1}$$