

Review
ELEKTROSTATIKA

R.1. Medan Listrik Partikel Bermuatan

Di sekeliling partikel bermuatan q , terdapat medan listrik E yang besarnya sbb. :

$$E = \frac{1}{4\pi\epsilon_0} \frac{q}{r^2}.$$

Jika di dalam medan E tersebut diletakkan sebuah muatan lagi (q_0), maka antara q dan q_0 akan muncul gaya yang besarnya :

$$F = \frac{1}{4\pi\epsilon_0} \frac{qq_0}{r^2}.$$

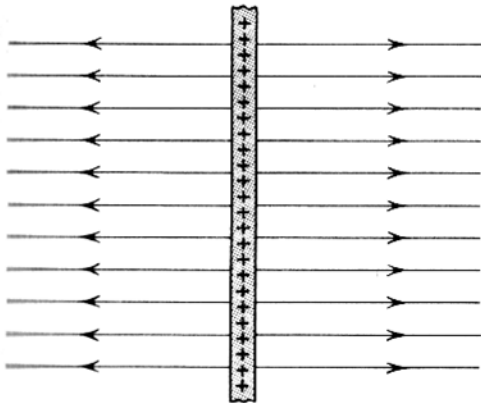


figure 27-2
Lines of force for a section of an infinitely large sheet of positive charge.

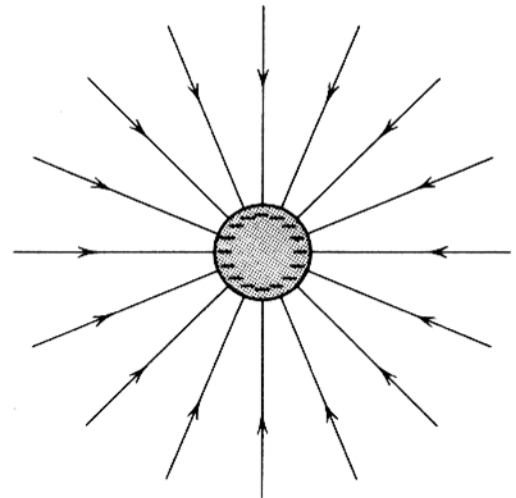


figure 27-3
Lines of force for a negatively charged sphere.

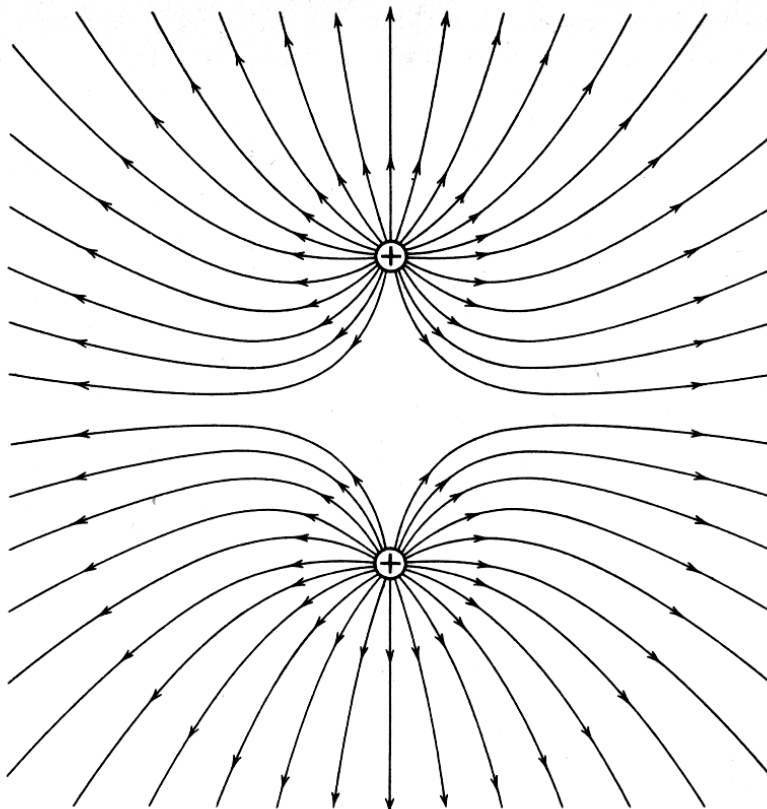


figure 27-4
Lines of force for two equal positive charges.

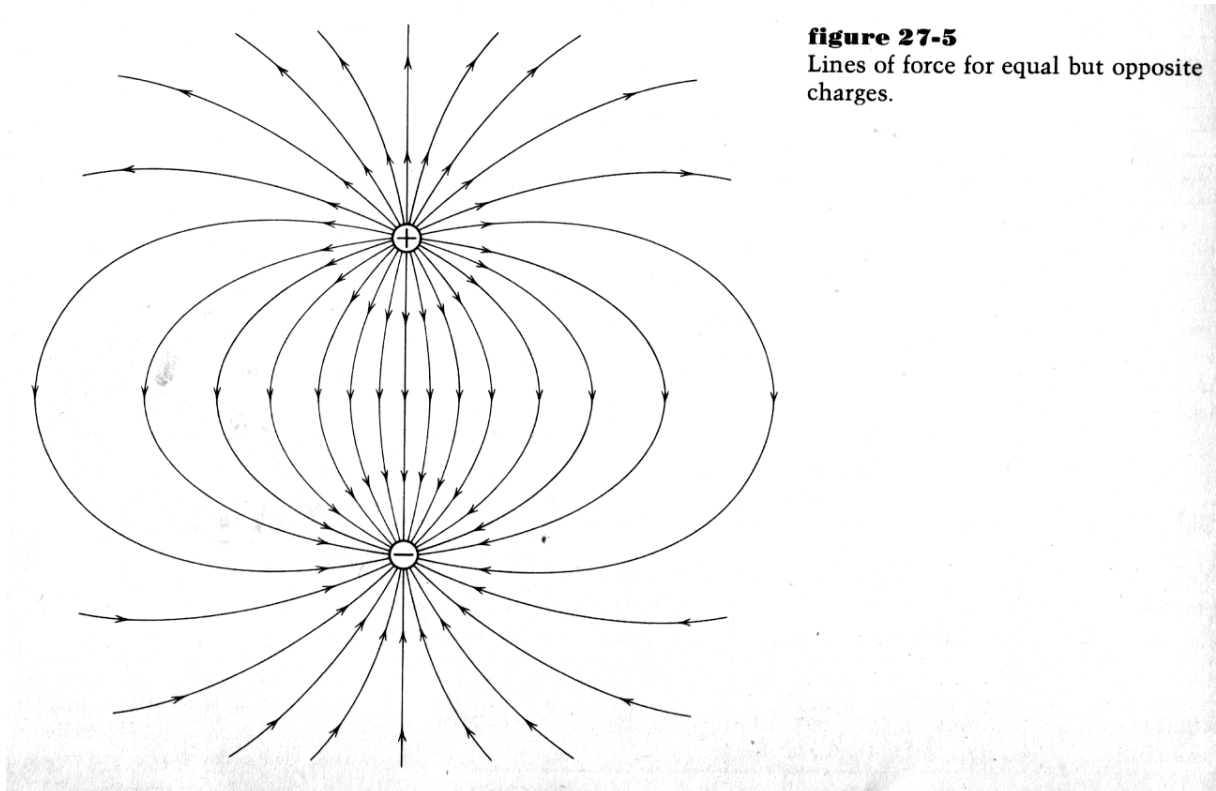


figure 27-5
Lines of force for equal but opposite charges.

APPENDIX

A

PROBABLE VALUES OF GENERAL PHYSICAL CONSTANTS[†]

Constant	Symbol	Value
Electronic charge.....	q	$1.602 \times 10^{-19} \text{ C}$
Electronic mass.....	m	$9.109 \times 10^{-31} \text{ kg}$
Ratio of charge to mass of an electron.....	q/m	$1.759 \times 10^{11} \text{ C/kg}$
Mass of atom of unit atomic weight (hypothetical).....	$1.660 \times 10^{-27} \text{ kg}$
Mass of proton.....	m_p	$1.673 \times 10^{-27} \text{ kg}$
Ratio of proton to electron mass.....	m_p/m	1.837×10^3
Planck's constant.....	h	$6.626 \times 10^{-34} \text{ J-s}$
Boltzmann constant.....	\bar{k}	$1.381 \times 10^{-23} \text{ J/}^\circ\text{K}$
	k	$8.620 \times 10^{-5} \text{ eV/}^\circ\text{K}$
Stefan-Boltzmann constant.....	σ	$5.670 \times 10^{-8} \text{ W/(m}^2\text{)}(^\circ\text{K}^4)$
Avogadro's number.....	N_A	$6.023 \times 10^{23} \text{ molecules/mole}$
Gas constant.....	R	$8.314 \text{ J/(deg)(mole)}$
Velocity of light.....	c	$2.998 \times 10^8 \text{ m/s}$
Faraday's constant.....	F	$9.649 \times 10^3 \text{ C/mole}$
Volume per mole.....	V_o	$2.241 \times 10^{-2} \text{ m}^3$
Acceleration of gravity.....	g	9.807 m/s^2
Permeability of free space.....	μ_o	$1.257 \times 10^{-6} \text{ H/m}$
Permittivity of free space.....	ϵ_o	$8.849 \times 10^{-12} \text{ F/m}$

[†] E. A. Mechtly, "The International System of Units: Physical Constants and Conversion Factors," National Aeronautics and Space Administration, NASA SP-7012, Washington, D.C., 1964.