F

$$F = \frac{QQ'}{4\pi\varepsilon_0 r^3} r$$
(1)

ε_0 $E(x)$

$$F = Q'E$$
(2)

$$E = \frac{Qr}{4\pi\varepsilon_0 r^3}$$
(3)

$$E(x) = \int_V \frac{\rho(x') r}{4\pi\varepsilon_0 r^3} \mathrm{d}V'$$
(4)

$$\oint_S E \cdot \mathrm{d}S = \frac{Q}{\varepsilon_0}$$
(5)

$$\oint_S E \cdot \mathrm{d}S = \frac{Q}{4\pi\varepsilon_0} \oint \mathrm{d}\Omega = \frac{Q}{\varepsilon_0}$$
(6)

$d\Omega$

$$\oint_s E \cdot \mathrm{d}S = \frac{1}{\varepsilon_0} \int_V \rho \mathrm{d}V$$
(7)

$$\nabla \cdot E = \frac{\rho}{\varepsilon_0}$$
(8)

$$\oint_L E \cdot \mathrm{d}l = \frac{Q}{4\pi\varepsilon_0} \oint_L \frac{\mathrm{d}r}{r^2} = -\frac{Q}{4\pi\varepsilon_0} \oint_L \mathrm{d}\left(\frac{1}{r}\right)$$
(9)

$$\oint_L E \cdot \mathrm{d}l = 0$$
(10)

$$\nabla \times E = 0$$
(11)

$$\oint_S J \cdot \mathrm{d}S = \int_V \nabla \cdot J \mathrm{d}V = -\int_V \frac{\partial \rho}{\partial t} \mathrm{d}V$$
(12)

$$\nabla \cdot J + \frac{\partial \rho}{\partial t} = 0$$
(13)

$\partial\rho/\partial t =$
0

$$\nabla \cdot J = 0$$
(14)

$$dF = Idl \times B$$
(15)

$$B(x) = \frac{\mu_0}{4\pi} \int_V \frac{J(x') \times r}{r^3} \mathrm{d}V'$$
(16)

$$B(x) = \frac{\mu_0}{4\pi} \oint_L \frac{I \mathrm{d}l \times r}{r^3}$$
(17)

$$\oint_L B \cdot dl = \mu_0 I$$
(18)

$$\nabla \times B = \mu_0 J$$
(19)

$$\oint_s B \cdot \mathrm{d}S = 0$$
(20)

$$\nabla \cdot B = 0$$
(21)

$$\oint E \cdot dl = E = -\frac{d}{dt} \int B \cdot dS$$