Ecuaciones en Electrostática $\leftrightarrow$ Ecuaciones en Magnetostática

$$\mathbf{E} = \frac{1}{4\pi\varepsilon_0} q' \frac{\mathbf{r}-\mathbf{r}'}{|\mathbf{r}-\mathbf{r}'|^3} \qquad \mathbf{B} = \frac{\mu_0}{4\pi} q' \mathbf{v}' \times \frac{\mathbf{r}-\mathbf{r}'}{|\mathbf{r}-\mathbf{r}'|^3}$$

$$\mathbf{F} = q\,\mathbf{E} \qquad \mathbf{F} = q\,\mathbf{v} \times \mathbf{B}$$

$$\nabla \cdot \mathbf{E} = \rho/\varepsilon_0 \qquad \nabla \times \mathbf{B} = \mu_0 \mathbf{J}$$

$$\int \nabla \cdot \mathbf{E}\, dV = \oint \mathbf{E} \cdot d\mathbf{S} \qquad \int \nabla \times \mathbf{B}\, d\mathbf{S} = \oint \mathbf{B} \cdot d\mathbf{l}$$

$$\oint \mathbf{E} \cdot d\mathbf{S} = \frac{1}{\varepsilon_0} \int \rho\, dV = \frac{1}{\varepsilon_0} q_{enc} \qquad \oint \mathbf{B} \cdot d\mathbf{l} = \mu_0 \int \mathbf{J} \cdot d\mathbf{S} = \mu_0 I_{con}$$

$$\nabla \times \mathbf{E} = 0 \Rightarrow \mathbf{E} = -\nabla\Phi \qquad \nabla \cdot (\nabla \times \mathbf{A}) = 0;\ \nabla \cdot \mathbf{B} = 0 \Rightarrow \mathbf{B} = \nabla \times \mathbf{A}$$

$$\nabla\Phi = \nabla(\Phi + cte) \qquad \nabla \times \mathbf{A} = \nabla \times (\mathbf{A} + \nabla f)$$

$$\nabla \times (\nabla \times \mathbf{A}) = \nabla(\nabla \cdot \mathbf{A}) - \nabla^2 \mathbf{A} = \nabla \times \mathbf{B}$$

$$\nabla \cdot (\nabla\Phi) = \nabla^2\Phi = -\rho/\varepsilon_0 \qquad Si \quad \nabla \cdot \mathbf{A} = 0 \Rightarrow \nabla^2 \mathbf{A} = -\mu_0 \mathbf{J}$$

$$\Phi = \frac{1}{4\pi\varepsilon_0} \int \frac{\rho}{|\mathbf{r}-\mathbf{r}'|} dV \qquad \mathbf{A} = \frac{\mu_0}{4\pi} \int \frac{\mathbf{J}}{|\mathbf{r}-\mathbf{r}'|} dV$$