1. Fuerza

$$\boxed{\vec{F} = K\frac{Qq}{r^2}\vec{u}_r} \qquad K = \frac{1}{4\pi\varepsilon} \qquad \boxed{\vec{E} = \frac{\vec{F}}{q}} = K\frac{Q}{r^2}\vec{u}_r$$

2. Energía potencial

$$T_{A\to B} = -\Delta E_p \qquad E_p(\infty) = 0 \qquad E_p(A) = T_{A\to\infty}$$

$$E_p(A) = \int_A^\infty \vec{F}\cdot d\vec{r} = \int_A^\infty K\frac{Qq}{r^2}\,dr = -K\frac{Qq}{r_\infty} + K\frac{Qq}{r_A} = K\frac{Qq}{r_A}$$

$$\boxed{E_p = K\frac{Qq}{r}} \qquad \boxed{V = \frac{E_p}{q}} = K\frac{Q}{r}$$

$$T_{A\to B} = E_p(A) - E_p(B) = q(V_A - V_B)$$

3. Equipotenciales

$$dT = d\vec{F}\cdot d\vec{r} \qquad qE\,dr\cos\alpha = 0 \qquad \boxed{\vec{E}\perp d\vec{r}}$$

4. Relacción entre intensidad y potencial

$$T_{A\to B} = q(V_A - V_B) = \int_A^B q\vec{E}\cdot d\vec{r} \qquad -\Delta V = \int_A^B E\,dr\cos\alpha \qquad -dV = E\,dr\cos\alpha$$

$$\boxed{E\cos\alpha = -\frac{dV}{dr}}$$

5. Gauss

$$\boxed{\Phi = \vec{E}\cdot\vec{S}} \qquad \Phi = \int_s \vec{E}\cdot d\vec{S}$$

$$\Phi = \int_s E dS\cos\alpha = \int_s \frac{1}{4\pi\varepsilon}\frac{q}{r^2}dS\cos\alpha = \frac{q}{4\pi\varepsilon}\int_s d\Omega = \frac{q}{4\pi\varepsilon}4\pi \qquad \boxed{\Phi = \frac{q}{\varepsilon}}$$

6. Aplicaciones de Gauss

Placa cargada : $\Phi_{cilindro} = 2\vec{S}\cdot\vec{E} \qquad q = \sigma S \qquad 2SE = \frac{q}{\varepsilon} \qquad E = \frac{\sigma}{2\varepsilon}$

Esfera cargada : $\Phi_{esfera} = \int_s \vec{E}\cdot d\vec{S} = E4\pi r^2 \qquad E4\pi r^2 = \frac{q}{\varepsilon} \qquad E = \frac{1}{4\pi\varepsilon}\frac{q}{r}$