PHYSICS 231 – CHAPTER 23: ELECTRIC POTENTIAL

Potential energy for two point charges:

$$U = \frac{1}{4\pi\epsilon_0}\frac{q_1 q_2}{r}$$

Potential:

$$V = \frac{U}{q}$$

Potential difference:

$$V_a - V_b = \int_a^b \vec{E} \cdot d\vec{l}$$

Electric field:

$$\vec{E} = -\vec{\nabla}V = -\frac{\partial V}{\partial x}\hat{\mathbf{i}} - \frac{\partial V}{\partial y}\hat{\mathbf{j}} - \frac{\partial V}{\partial z}\hat{\mathbf{k}}$$