

$$\text{I. } \oint\!\!\!\oint_{\text{closed surface}} \vec{\mathbf{E}} \cdot d\vec{\mathbf{a}} = 4\pi q_{\text{enclosed}}$$

$$\text{II. } \oint\!\!\!\oint_{\text{closed surface}} \vec{\mathbf{B}} \cdot d\vec{\mathbf{a}} = 0$$

$$\text{III. } \oint_{\text{closed loop}} \vec{\mathbf{E}} \cdot d\vec{\mathbf{s}} = -\frac{1}{c} \frac{d}{dt} \iint_{\text{open surface}} \vec{\mathbf{B}} \cdot d\vec{\mathbf{a}}$$

$$\text{IV. } \oint_{\text{closed loop}} \vec{\mathbf{B}} \cdot d\vec{\mathbf{s}} = \frac{4\pi}{c} I_{\text{enclosed}} + \frac{1}{c} \frac{d}{dt} \iint_{\text{open surface}} \vec{\mathbf{E}} \cdot d\vec{\mathbf{a}}$$

**Lorentz Force Equation:**

$$\text{V. } \vec{\mathbf{F}}_q = q\vec{\mathbf{E}} + q\frac{\vec{\mathbf{v}}}{c} \times \vec{\mathbf{B}}$$