Summary for Content after Test 6

- Determine $\vec{B}$:

$$\vec{M} \longrightarrow \vec{J}_b, \vec{K}_b \xrightarrow[\text{Ampère's Law}]{} \vec{B}$$

$$\vec{M} \longrightarrow \vec{H} = -\vec{\nabla} W \xrightarrow[\text{separ. of variables}]{} W \to \vec{H} \to \vec{B}$$

$$I_f \xrightarrow[\text{Ampère's Law}]{} \vec{H} \to \vec{B}$$

- Boundary Conditions $\xrightarrow{\text{apply}}$ sketch for bar magnet $\vec{M}, \vec{B}, \vec{H}$

- $\mathcal{E} = -\dfrac{d\Phi}{dt} = -\dfrac{d}{dt}\int \vec{B} \cdot d\vec{a}$ $\quad \mathcal{E} = IR$ and from before: $\Delta V = -\int_-^+ \vec{E} \cdot d\vec{l}$

  $C = \dfrac{Q}{\Delta V}$

- in matter $\vec{J} = \sigma(\vec{E} + \underbrace{\vec{v} \times \vec{B}}_{\text{neglected in examples}})$

- $\Phi = MI$

  $\Phi = LI$

- $W = \dfrac{1}{2\mu} \displaystyle\int_{\text{all space}} B^2 d\tau = \dfrac{1}{2\mu_0}\left[\int_{\mathcal{V}} B^2 d\tau + \int_S (\vec{A} \times \vec{B}) \cdot d\vec{a}\right]$

  $W = \frac{1}{2} L I^2$

- Maxwell Equations
  - correction
  - interpretation
  - differential $\longleftrightarrow$ integral
  - derive boundary conditions

Thank you for great semester with you!