**Impedance**

\[ V = IR \Rightarrow V = IZ \]

**Where**

\[ Z = \sqrt{(X_L - X_C)^2 + R^2} \]

- **Inductive Reactance**
  \[ X_L = \omega L \]
- **Capacitive Reactance**
  \[ X_C = \frac{1}{\omega C} \]

**Forced Signal**

\[ f^* \]

**At Resonance:**

\[ X_L = X_C \Rightarrow Z = R \]

**Note:** Not always the case

**Experiment:**

- **Power Amp:** 2.97V
- **Sine Wave @ 10Hz**
- **Scope:** Output Voltage vs. Voltage Sensor (5000 Hz)
- **Iron Core Inside Inductor**
- **Note:** Voltage Sensor Around Resistor, Not Inductor

**Report**

- Coversheet
- Questions
- Tapes
- Plot
- Current \( \frac{V_r}{E} \) vs. Linear Freq (f)
- \( V_r \) vs Linear Freq
- Voltage vs Time at Resonance

\[ V \]

\[ \sim T \stackrel{-}{\sim} \]