

Peak AC Problems



“Ohms” Law for each element

NOTE: Good for PEAK values only)

$$V_{gen} = I_{max} Z$$

$$V_{Resistor} = I_{max} R$$

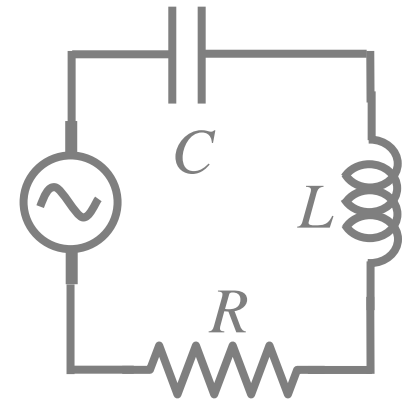
$$V_{inductor} = I_{max} X_L$$

$$V_{Capacitor} = I_{max} X_C$$

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

$$X_L = \omega L$$

$$X_C = \frac{1}{\omega C}$$



Typical Problem

A generator with peak voltage 15 volts and angular frequency 25 rad/sec is connected in series with an 8 Henry inductor, a 0.4 mF capacitor and a 50 ohm resistor. What is the peak current through the circuit?

What happens to the impedance if we decrease the angular frequency to 20 rad/sec?

- A) Z increases
- B) Z remains the same
- C) Z decreases**

$$(X_L - X_C): (200 - 100) \rightarrow (160 - 125)$$

