Peak AC Problems

"Ohms" Law for each element

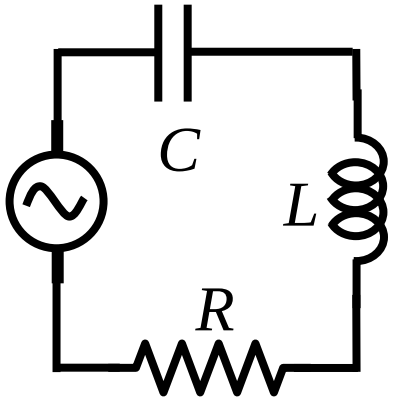
NOTE: Good for PEAK values only)

$$V_{gen} = I_{\max} Z$$
$$V_{Resistor} = I_{\max} R$$
$$V_{inductor} = I_{\max} X_L$$
$$V_{Capacitor} = I_{\max} X_C$$

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

$$X_L = \omega L$$

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



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?

$$X_L = \omega L = 200\Omega \qquad Z = \sqrt{R^2 + (X_L - X_C)^2} = 122\Omega$$

$$X_C = \frac{1}{\omega C} = 100\Omega \qquad I_{\max} = \frac{V_{gen}}{Z} = 0.13A$$