Calculation

Consider the harmonically driven series LCR circuit shown.

$V_{max} = 100\ V$

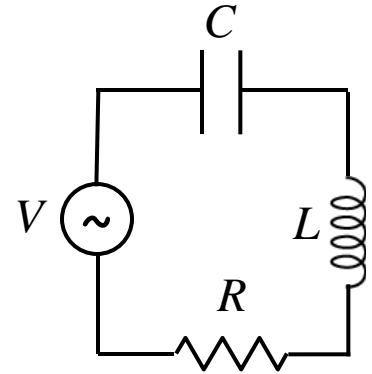$I_{max} = 2\ mA$

$V_{Cmax} = 113\ V$

The current leads generator voltage by 45°

L and R are unknown.

What is X_L, the reactance of the inductor, at this frequency?

Conceptual Analysis

The maximum voltage for each component is related to its reactance and to the maximum current.

The impedance triangle determines the relationship between the maximum voltages for the components

Strategic Analysis

Use V_{max} and I_{max} to determine Z

Use impedance triangle to determine R

Use V_{Cmax} and impedance triangle to determine X_L