

### **Supplementary Problems (S-):**

22. Consider a series RLC circuit with an oscillating voltage source of 110 volts (rms) at 60 Hz. The resistance is  $62\ \Omega$ , the capacitance is  $16\ \mu\text{F}$ , and the inductance is 90 mH.

- a) What is the capacitive reactance ( $X_C$ ) ?
- b) What is the inductive reactance ( $X_L$ ) ?
- c) What is the impedance ( $Z$ ) of the circuit?
- d) What is the rms current through this circuit?
- e) Explain why  $V_{ac}(t) = V_L(t) + V_C(t) + V_R(t)$  but  $V_{AC-rms}$  does not equal  $V_{L-rms} + V_{C-rms} + V_{R-rms}$ .

### **Answers to Supplementary Problems:**

22. (a)  $165.79\ \Omega$ ; (b)  $33.93\ \Omega$ ; (c)  $145.7\ \Omega$ ; (d)  $.755\ \text{amps-rms}$ ; (e) you are on your own!  
HINT: consider conservation of energy, definition of voltage, and phase angles.