Physics 200

Chapter 33 AC Circuits (Homework)

1. Derive the average power of a series LRC circuit in terms of the rms current.

2. Derive the rms current through the capacitor of a parallel LRC circuit.

3. Derive the rms current through the inductor of a parallel LRC circuit.

4. Derive the rms current delivered by the source of a parallel LRC circuit.

5. Derive the phase angle between the rms voltage and the rms current of a parallel LRC circuit.

6. A transformer circuit consists of a voltage source, V_S, a source resistance, R_S, a load resistance, R_L, and a transformer with "N_1" turns on the primary side and "N_2" turns on the secondary side. What is the voltage across the load resistor?

7. Determine the gain as a function of frequency when a high pass filter's output is used as the input to a low pass filter. The capacitors have value "C" and the resistors have value "R".