1. Write an expression for the complex impedance \( Z(w) \) of the given circuit.

2. Plot \( |Z(w)| \) vs \( w \) on a log-log plot (Bode plot). Identify the break frequencies.
   - Identify \( |Z(w)| \) as \( w \to \infty \).
   - Identify \( |Z(w)| \) as \( w \to 0 \).

3. Write an expression for the complex impedance of the given circuit.

   Plot \( \log |Z(w)| \) vs \( \log w \) (Bode plot).
   Plot \( \arg Z(w) = \arg \left[ \frac{\text{Im}(Z(w))}{\text{Re}(Z(w))} \right] \) vs \( \log w \).
   This is a plot of the phase shift.

4. Find the steady state value of \( V_{out}(t) \) in the given circuit.

   Use either the convolution or the Fourier Transform method - your choice! Let \( Z = \frac{1}{1/R} \) for algebraic simplicity.

5. Find the steady state value of \( V_{out}(w) \) in the given circuit.

   Let \( a = \frac{R}{L} \) and \( b = \frac{1}{rc} \) for algebraic simplicity.

6. Plot \( \log |V_{out}(w)|/|V_{o}(w)| \) vs \( \log w \) for the case of \( a = b \).