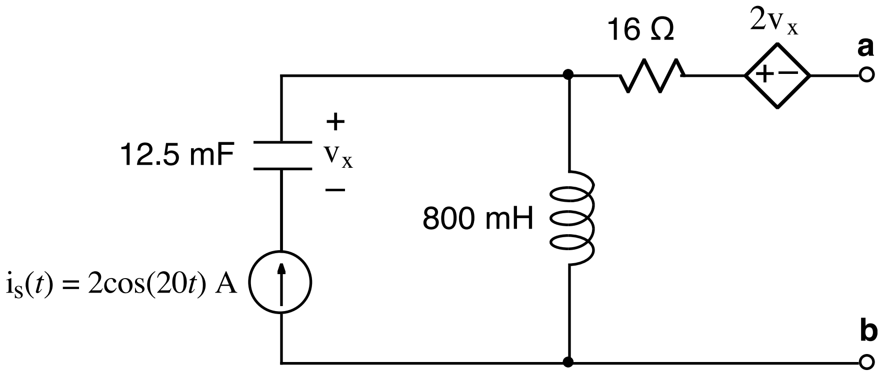
HOMEWORK #14

1. Draw the frequency-domain circuit diagram (with numerical values for impedances and phasors [except the dependent source which will be labeled $2\mathbf{V}_X$]) for the following circuit:



2. Given ω = 400 rad/s, for each of the following impedances, determine which of the following the impedance is from: a capacitor, an inductor, or a resistor. Also, find the value of that capacitor, inductor, or resistor.

   a) 1 kΩ

   b) –*j*50 Ω

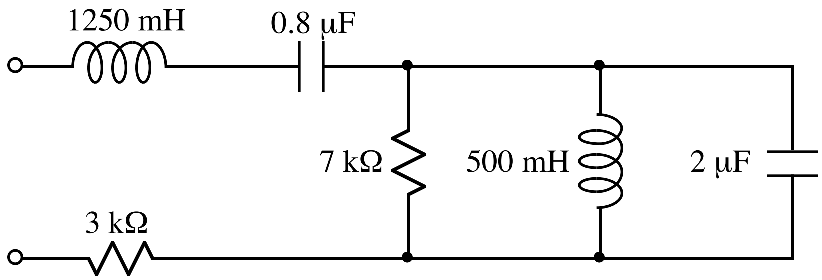
   c) *j*400 Ω

   d) –*j*2 kΩ

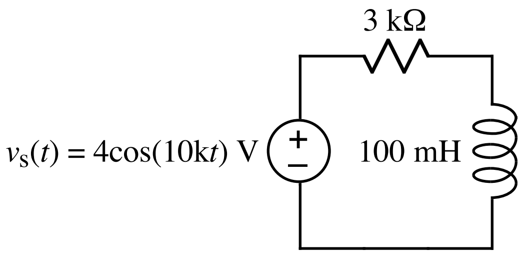
   e) *j*8 kΩ

3. Derive a symbolic expression for the impedance of an *R* in series with an *L* and *C* in parallel at frequency ω. Express the answer as a ratio of polynomials with complex coefficients.

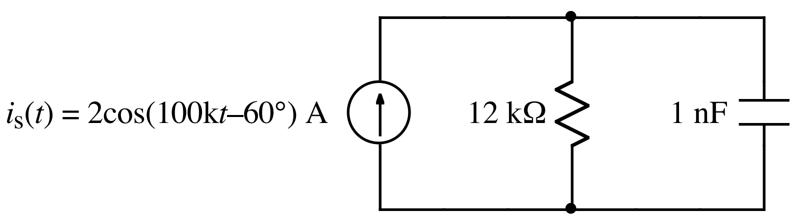
4. Find the total impedance of the circuitry shown below if ω = 50k rad/s.



5.



a) Find time-domain expressions for the waveforms of the voltages across the R and L in the above circuit.



b) Find time-domain expressions for the waveforms of the currents through the R and C in the above circuit.