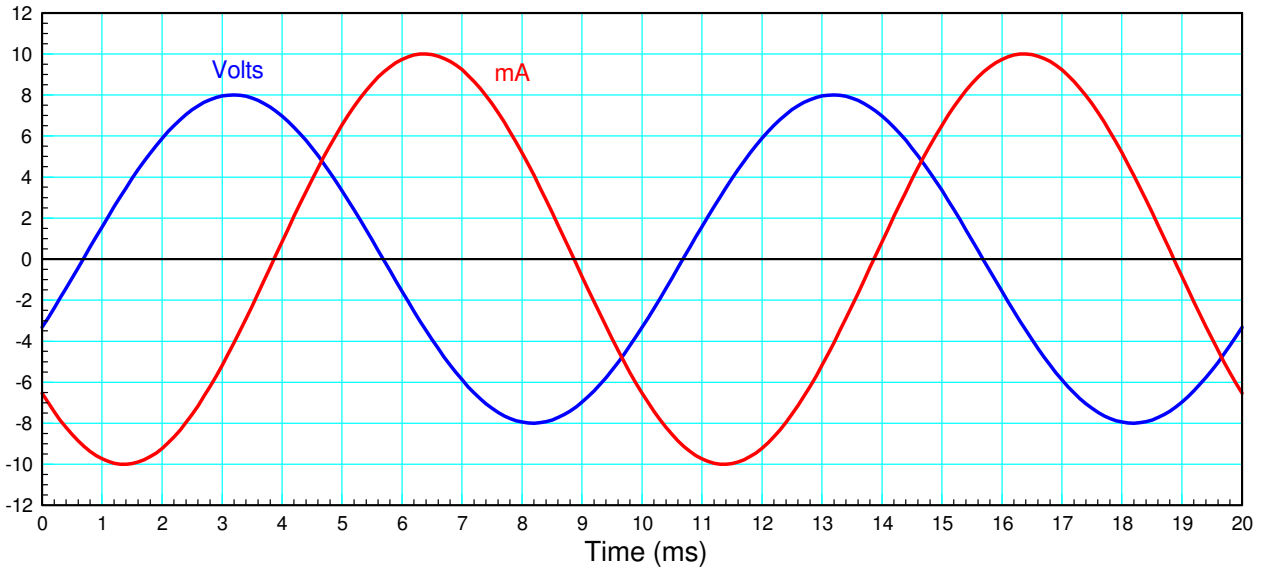# ECE 111 - Homework #13

ECE 311 Circuits II - Phasors - Due Monday, April 15th
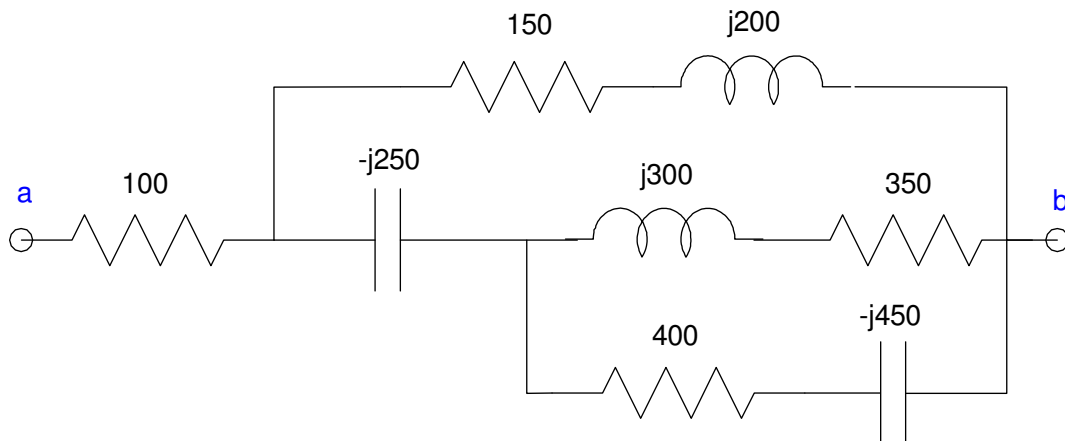
Phasor Voltages

1) Express V and I as phasors (i.e. as complex numbers)
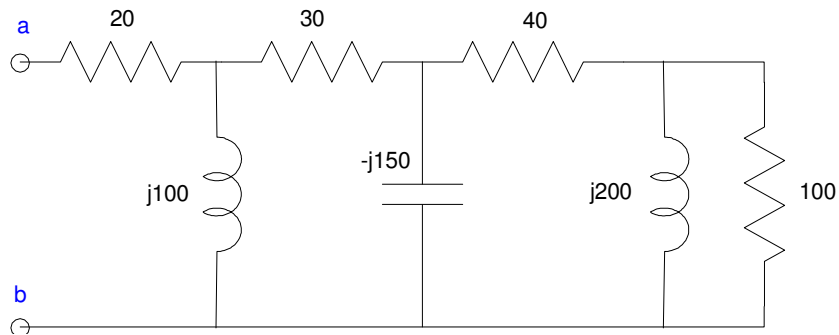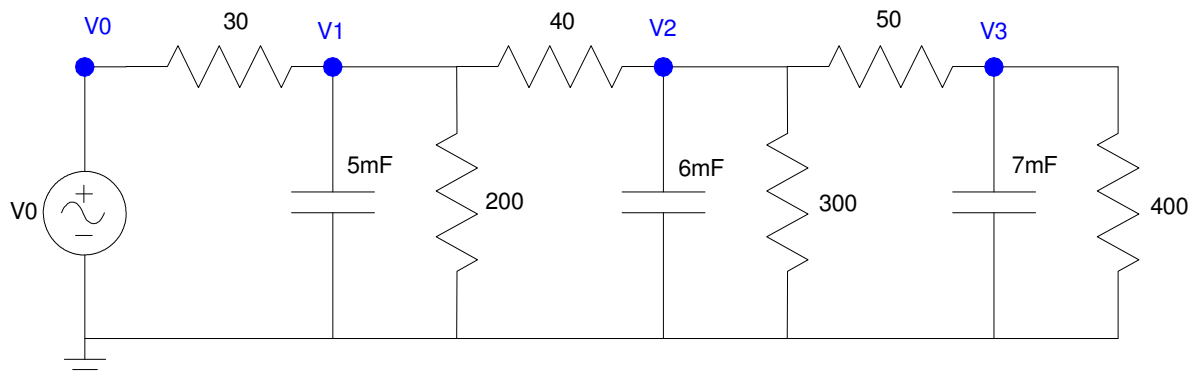- From this, determine the impedance, Z = V/I

Phasor Impedances

2) Determine the impedance, Zab

3) Determine the impedance, Zab

Voltage Nodes with Phasors

4) Assume V0 = 10.
   - a) Determine the impedances of each element at 0 rad/sec
   - b) Write the votlage node equations
   - c) Solve for V1, V2, and V3.

5) Check your results in CircuitLab

----

6) Assume $V_0 = 10\sin(3t)$ *10V, 3 rad/sec sine wave (0.478Hz)*
   - a) Determine the impedances of each element at 3 rad/sec
   - b) Write the votlage node equations
   - c) Solve for V1, V2, and V3 as complex numbers
   - d) Express V1, V2, and V3 in terms of sine and cosine function:
   - hint: V1 = a + jb (phasor representation) means $V_1(t) = a\cos(3t) - b\sin(3t)$

7) Check your results in CircuitLab using a transient simulation for 5 seconds (time step = 5ms).