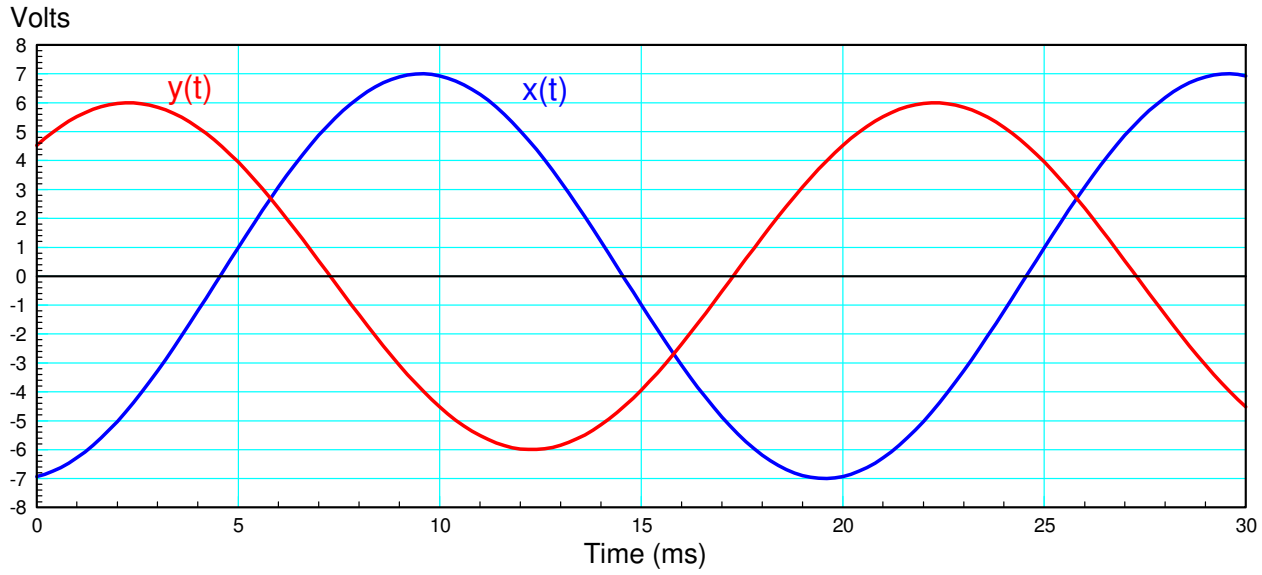
ECE 111 - Make-Up Homework #13

ECE 311 Circuits II - Phasors

Phasor Voltages

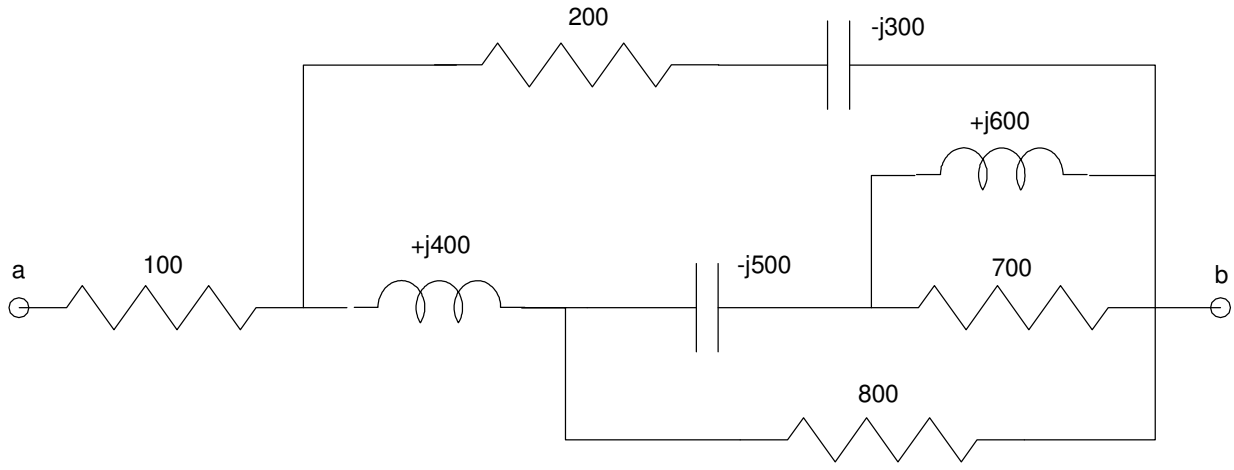
1) Express V and I as phasors (i.e. as complex numbers)

- From this, determine the impedance, Z = V/I

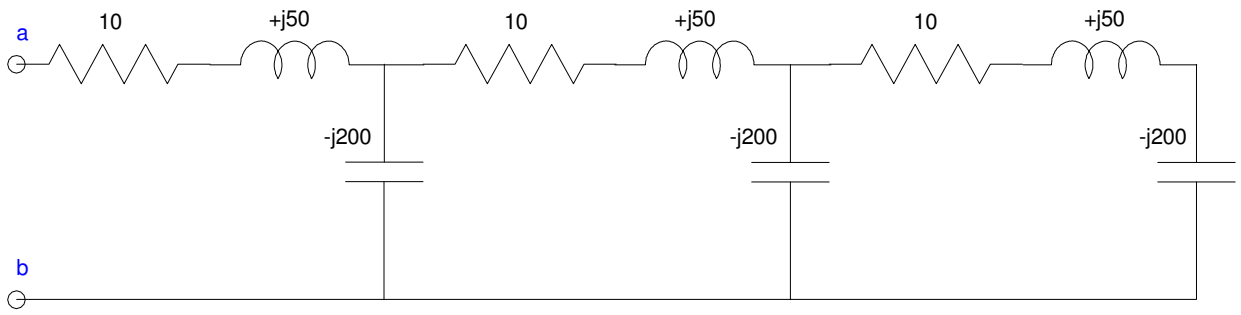


Phasor Impedances

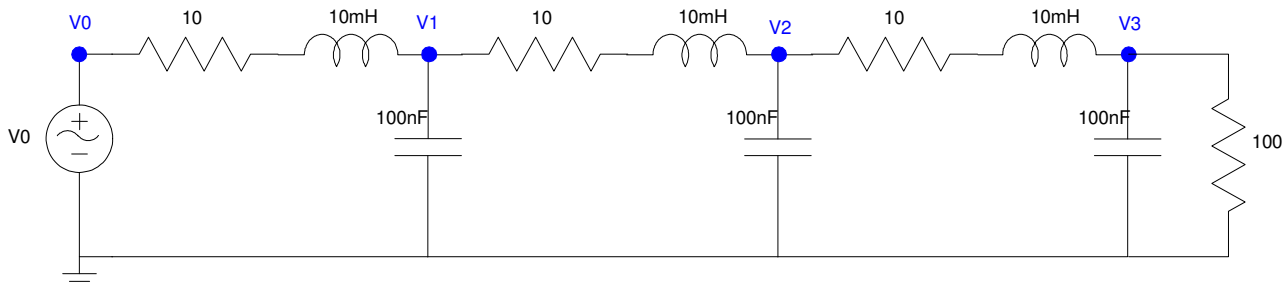
2) Determine the impedance, Zab



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

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6) Assume $V_0 = 10\sin(40t)$ *10V, 628 rad/sec sine wave (100Hz)*

- a) Determine the impedances of each element at 628 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 $V_1(t) = a\cos(40t) - b\sin(40t)$

7) Check your results in CircuitLab using a transient simulation for 500ms (time step = 5us).