

ECE 301
Fall Semester, 2007
Test #3

wlg Test 3B

Name _____
Print (last, first)

Work the exam on your own engineering paper. Work on one side of your paper only. Attach your work to the back of this exam sheet and staple in the top left hand corner. You have a choice of working either problem (1) or problem (2). Circle below the problem you wish to have graded. Each problem is 25%.

Grade (circle) : 1 2

- (1) You are given the circuit of Figure 1 with the indicated source voltage and line current. The line current is known to be; $\mathbf{I} = 2.83 \angle 60^\circ \text{ A}$. Determine the approximate value of the capacitor C.

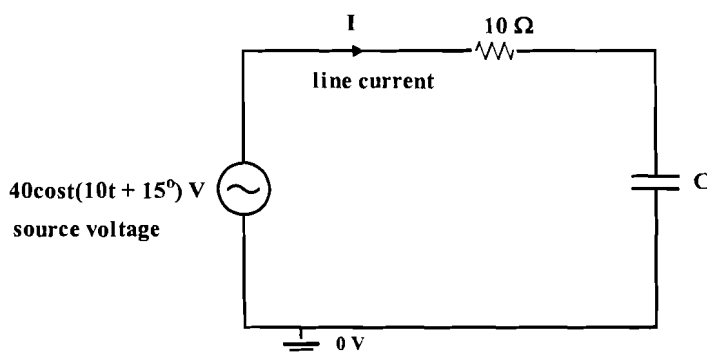


Figure 1: Circuit for problem 1.

- (2) You are given the op-amp circuit of Figure 2. Determine the phasor output voltage \mathbf{V} as shown in the circuit diagram. Express \mathbf{V} in polar form.

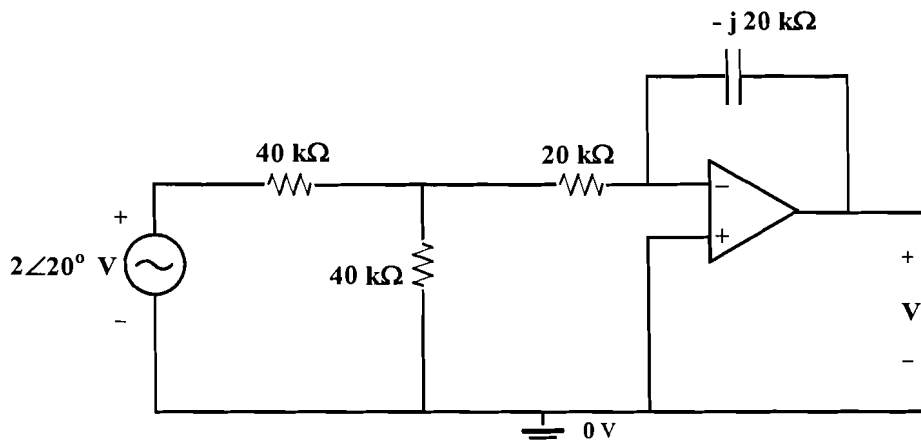


Figure 2: Circuit for problem 2.

- (3) You are given the AC circuit shown in Figure 3. Use mesh analysis to find the mesh currents I_1 and I_2 as indicated in the circuit diagram. Express I_1 and I_2 in polar form.

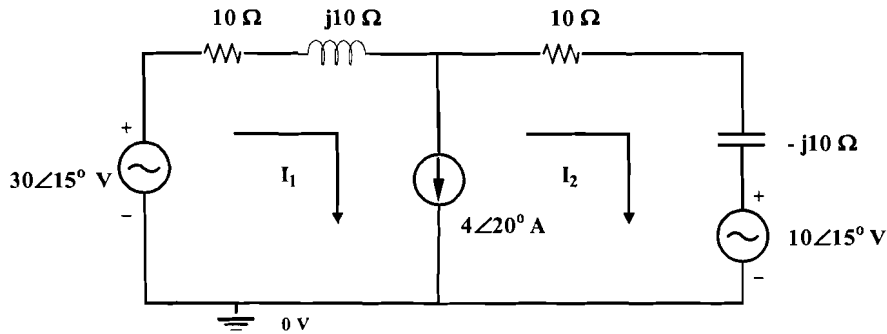


Figure 3: Circuit for problem 3.

- (4) You are given the AC circuit shown in Figure 4.
 (a) Use nodal analysis to find the node voltages V_1 and V_2 as indicated in the circuit diagram. Express V_1 and V_2 in polar form.
 (b) Prepare a phasor diagram showing V_1 and V_2 . Which voltage is leading? Explain.

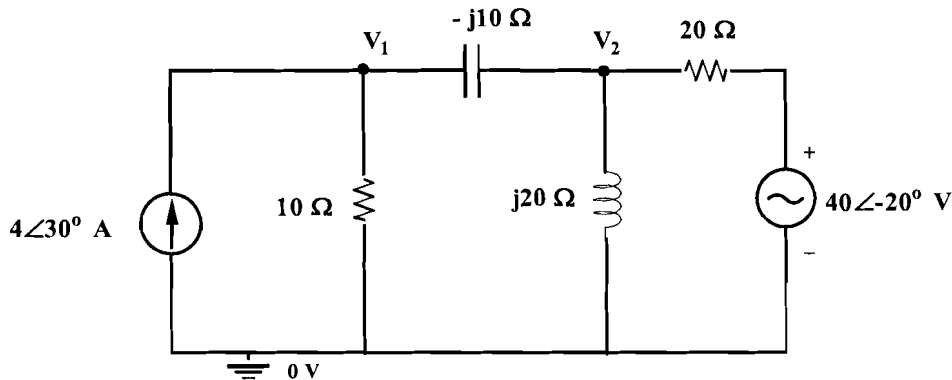


Figure 4: Circuit for problem 4.

- (5) The load for a certain AC circuit is shown in Figure 5.
 (a) Find the impedance of this load, Z , as indicated in the diagram. Express Z in polar form.
 (b) Determine whether this is a leading or lagging load. Explain your answer.

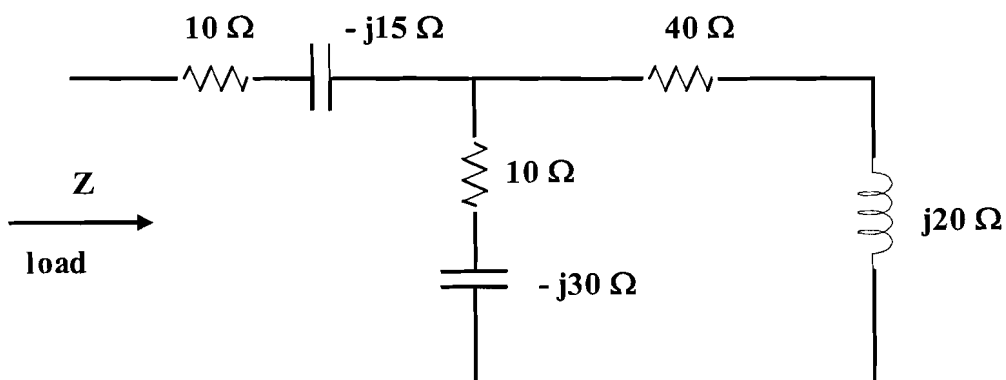


Figure 5: Circuit for problem 5.