

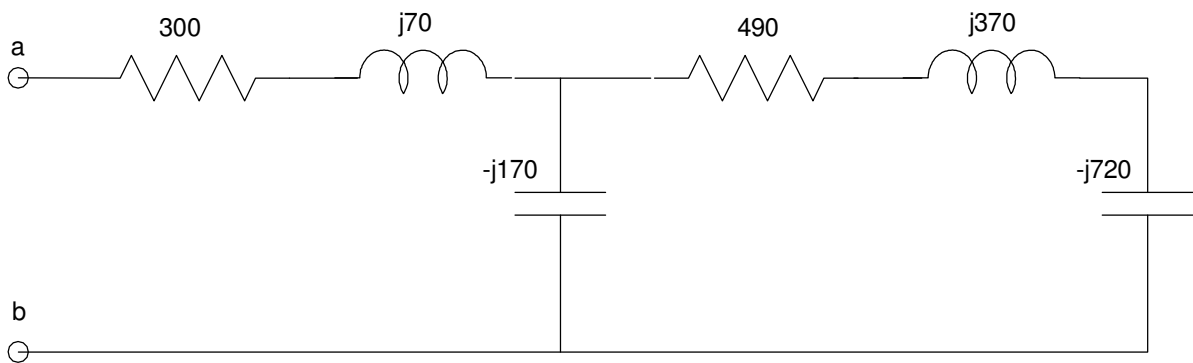
# ECE 111 - Homework #9

Week #9: ECE 311 Circuits II - Due 8am, Tuesday, March 22nd  
Please submit as a Word or pdf file and email to Jacob\_Glower@yahoo.com with header ECE 111 HW#9

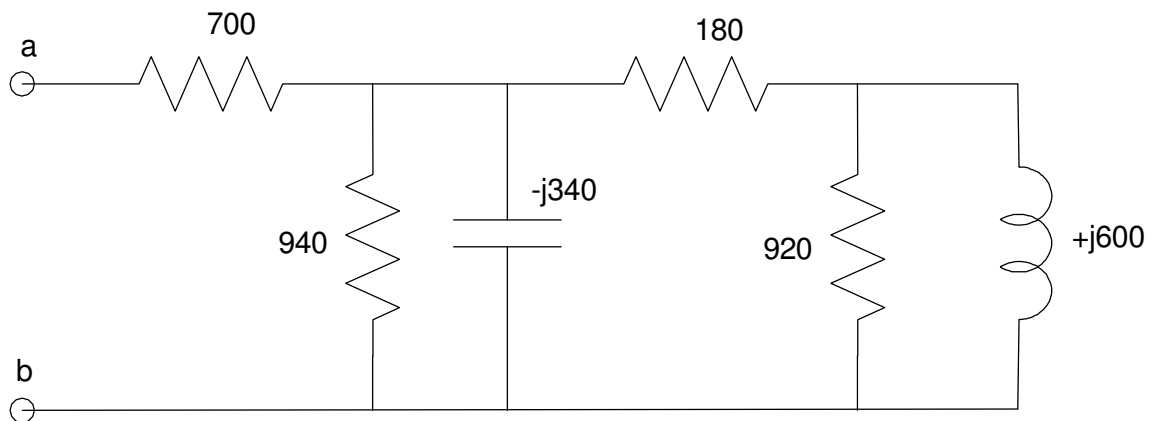
1) Solve for Y

- $Y = \left( \frac{(2+j5)(1+j6)}{7-j2} \right)$
- $Y = \left( \left( \frac{2+j5}{7-j2} \right) + \left( \frac{1+j6}{2-j7} \right) \right) \left( \frac{5+j6}{3+j8} \right)$

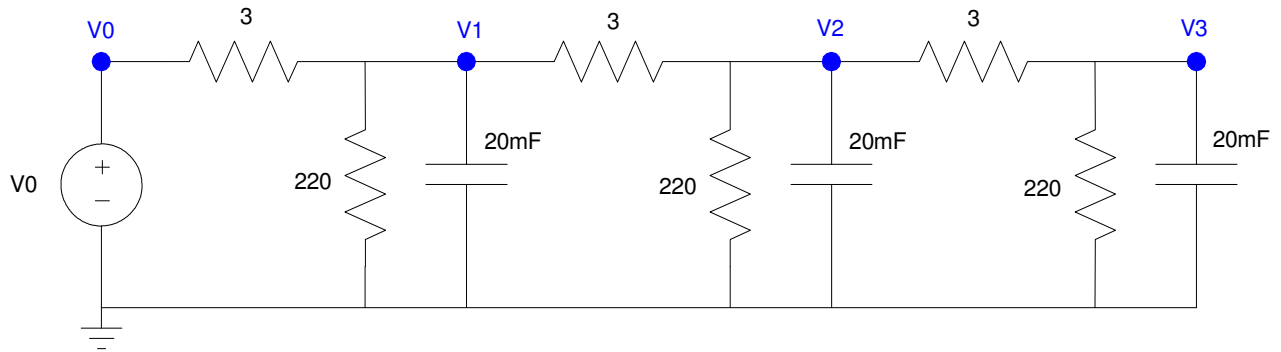
2) Determine the impedance Zab



3) Determine the impedance Zab



4) Assume  $V_0 = 10$



- Determine the impedances of each element at 0 rad/sec
- Write the voltage node equations
- Solve for  $V_1$ ,  $V_2$ , and  $V_3$ .

5) Check your results in CircuitLab

6) Assume  $V_0$  is a 10V, 4 rad/sec ( 0.637Hz )

$$V_0 = 10 \sin(4t)$$

- Determine the impedances of each element at 4 rad/sec
- Write the voltage node equations
- Solve for  $V_1$ ,  $V_2$ , and  $V_3$  as complex numbers
- Express  $V_1$ ,  $V_2$ , and  $V_3$  in terms of sine and cosine function:
  - hint:  $V_1 = a + jb$  (phasor representation) means  $V_1(t) = a \cos(4t) - b \sin(4t)$

7) Check your results in CircuitLab using a transient simulation for 6 seconds