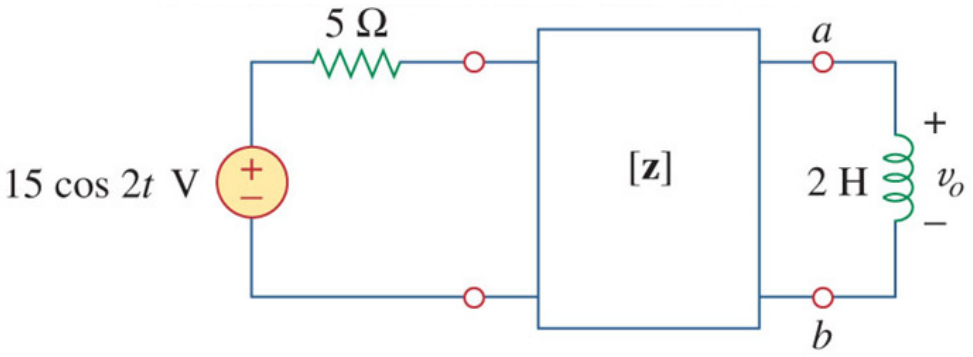
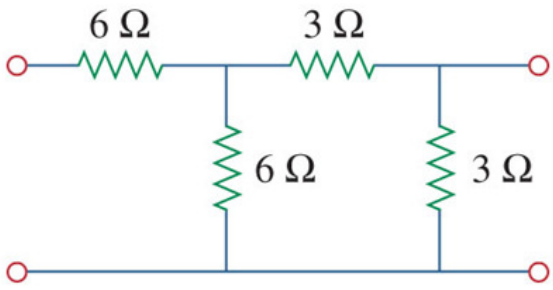
IUPUI ECE 202 Spring 2015:

Homework #11 (Due in class: April 20, 2015) Name:

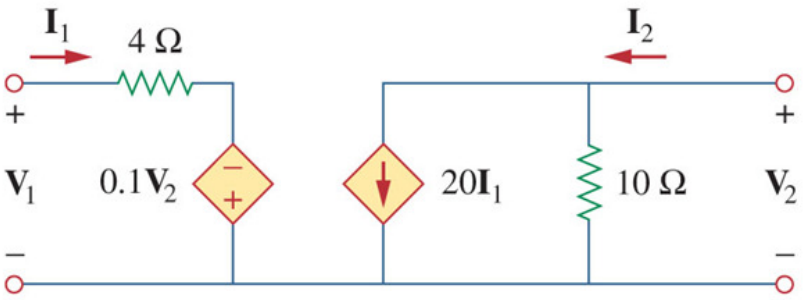
1. (Prob. 19.16 from Text) For the circuit shown, at $\omega = 2$ rad/s, $\mathbf{z}_{11} = 10\ \Omega$, $\mathbf{z}_{12} = \mathbf{z}_{21} = j6$ ohms, $\mathbf{z}_{22} = 4\ \Omega$. Obtain the Thevenin equivalent circuit at terminals a - b and calculate v_o:



2. (Prob. 19.18 from Text) Calculate the *y* parameters for the circuit below:

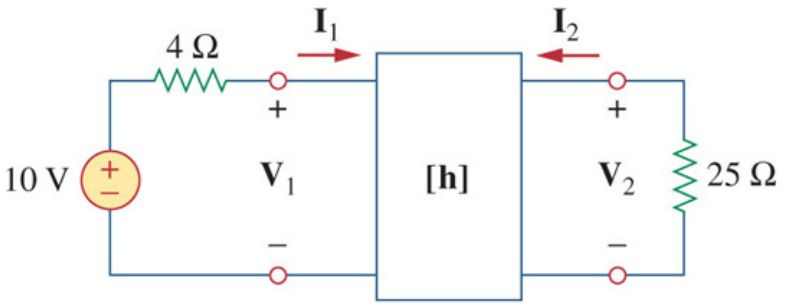


3. (Prob. 19.27 from Text) Find the *y* parameters for the circuit below:

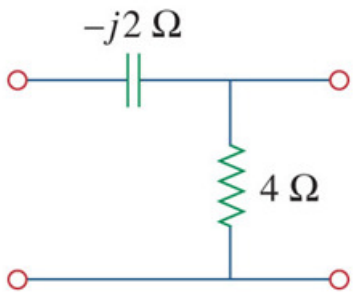


4. (Prob. 19.36 from Text) For the two-port shown below, find:
   a) $\mathbf{V_2/V_1}$
   b) $\mathbf{I_2/I_1}$
   c) $\mathbf{I_1/V_1}$
   d) $\mathbf{V_2/I_1}$

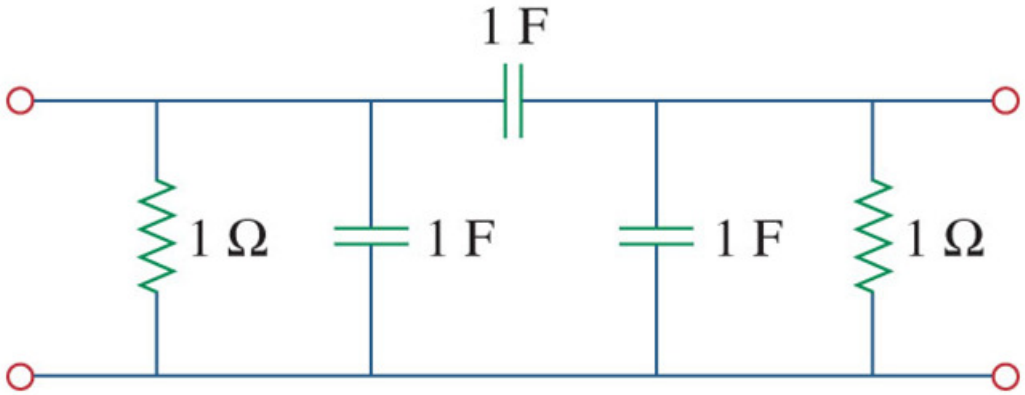
$$[h] = \begin{bmatrix} 16\ \Omega & 3 \\ -2 & 0.01\ \Omega^{-1} \end{bmatrix}$$



5. (Prob. 19.45 from Text) Find the **ABCD** parameters for the circuit below:



6. (Prob. 19.49 from Text) Using impedances in the *s*-domain, obtain the transmission (**ABCD**) parameters for the circuit below:



7. (Prob. 19.94 from Text) A transistor in it's common-emitter mode is specified by the following **h** parameters:

$$[h] = \begin{bmatrix} 200\ \Omega & 0 \\ 100 & 10^{-6}\ \Omega^{-1} \end{bmatrix}$$

Two such identical transistors are connected in cascade to form a two-stage amplifier used at audio frequencies. If the amplifier is terminated by a 4 kΩ resistor, calculate the overall voltage gain $\boldsymbol{A}_v$ and input impedance $\boldsymbol{Z}_{in}$.

Hint: Use the equations in section 19.9.1 for A_v and Z_{in}.