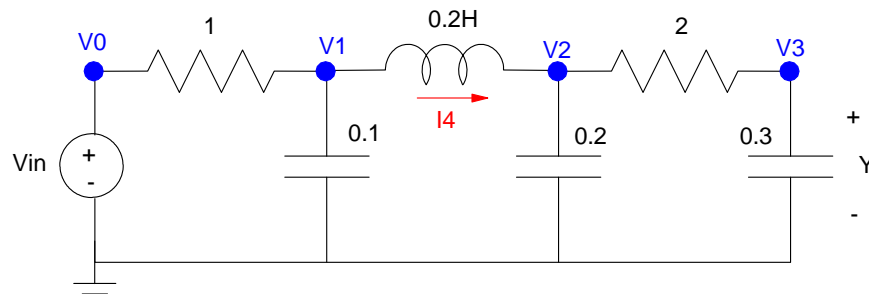


ECE 461/661 - Homework Set #5

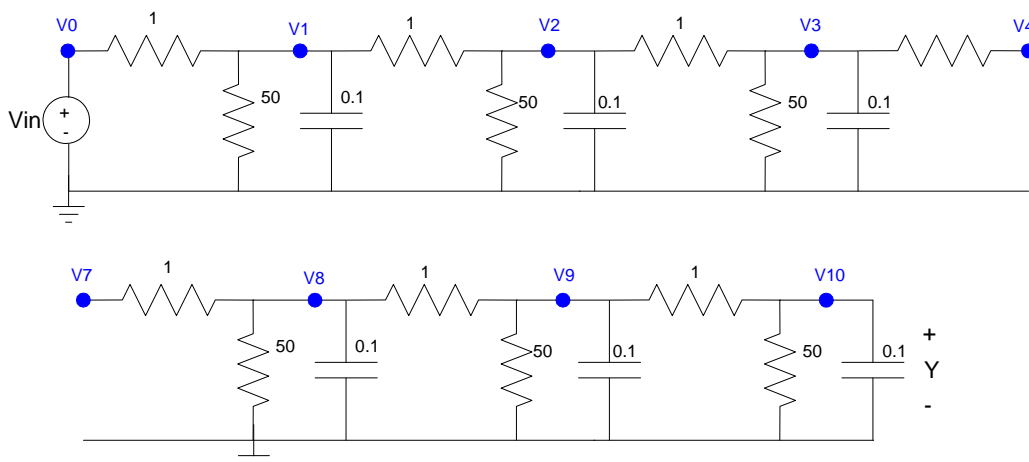
State-Space, Matlab, Electric circuits - Due Monday, October 3rd

- 1) Write the differential equations which describe the following circuit.
- 2) Express the dynamics for this system in state-space form
- 3) Find the transfer function from X to Y
- 4) Find a 2nd-order approximation for this transfer function
- 5) Plot the step response of the 4th-order system and its 2nd-order approximation



Problem 1-5

- 6) Write the differential equations which describe the following 10-stage RC filter at node V2 (i.e. write the voltage node equation at V2)
- 7) Express the dynamics for this system in state-space form
- 8) Find the transfer function from X to Y
- 9) Find a 2nd-order approximation for this transfer function
- 10) Plot the step response of the 4th-order system and its 2nd-order approximation



Problem 6-10: 10-Stage RC Filter (nodes 5-7 repeat the pattern - not shown)