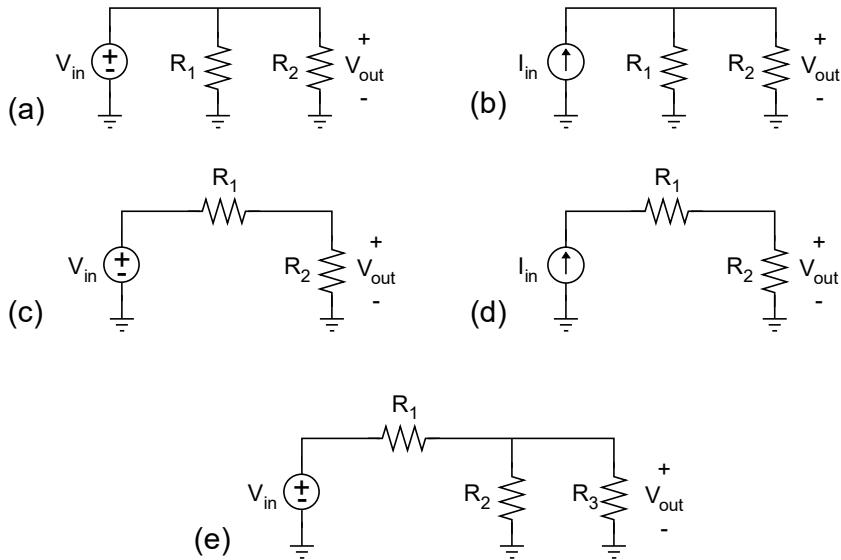


## EE 355 Analog Electronics Homework 1

1. Solve for expressions for  $V_{out}$ , the voltage across each resistor, and the current through each resistor for all parts a-e. Also, solve for the numerical values given that

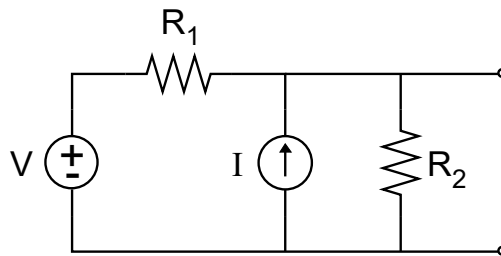
$$R_1 = 1k\Omega, R_2 = 10k\Omega, R_3 = 10k\Omega, V_{in} = 1V, \text{ and } I_{in} = 1mA$$

Additionally, derive expressions for the current through each resistor in Part b and the voltage across each resistor in Part C.

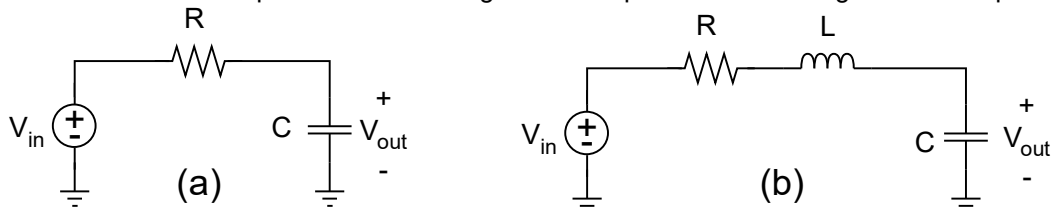


2. For the following circuit, determine both Thevenin and Norton equivalents. Use the following values.

$$R_1 = 1k\Omega, R_2 = 3k\Omega, V = 2V, \text{ and } I = 1mA$$

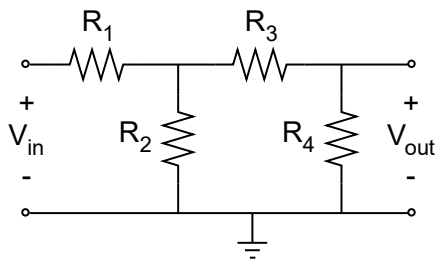


3. Solve for the Laplace-domain transfer function of each of the following circuits. The transfer function is defined as  $V_{out}/V_{in}$  and represents how changes in the input reflect to changes in the output.

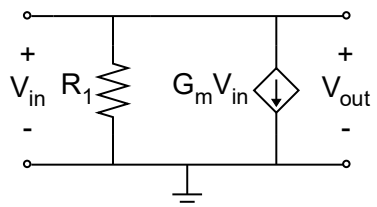


4. Determine an expression for both the input impedance and output impedance for each of the circuits shown below. Also, solve for the numerical values of the input and output impedances given that

$$R_1 = 200\Omega, R_2 = 200\Omega, R_3 = 100\Omega, R_4 = 200\Omega, \text{ and } G_m = 0.1\text{S}$$



(a)



(b)