CSE251-07
SUMMER 25 **Deadline: 09 July, 2025**
ASSIGNMENT 1 **(07:59 am)**

The goal of this assignment is to test your concept and knowledge of:

- Alternative representation of circuits (Line diagrams),
- Application of KCL and KVL in aforementioned representation.
- Op Amp circuit solving

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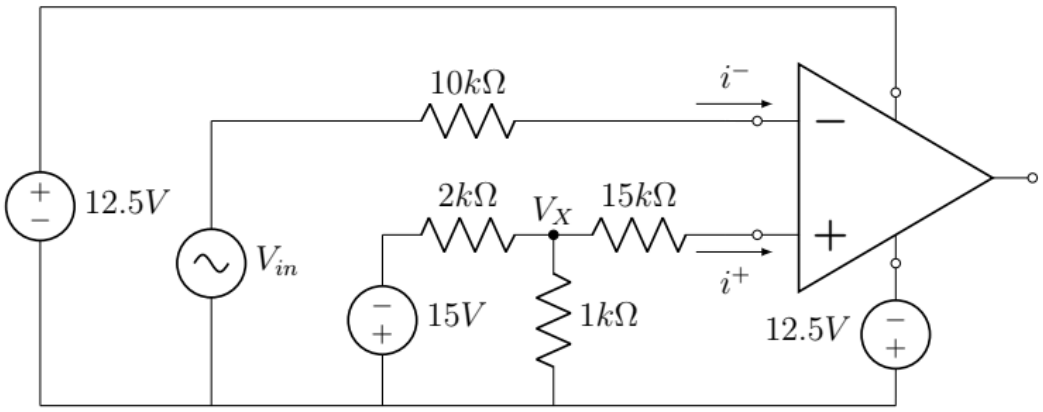
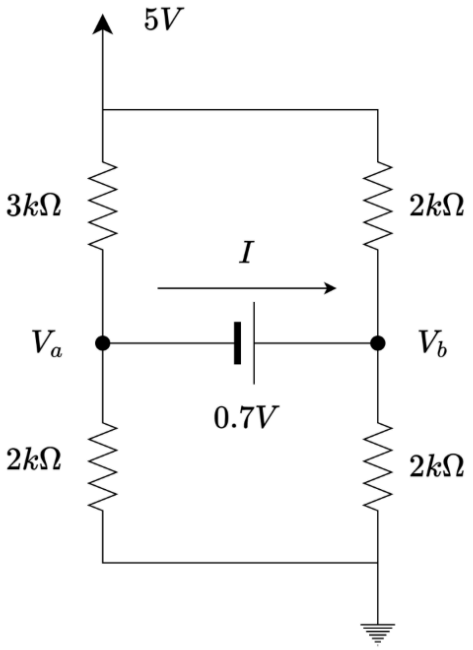
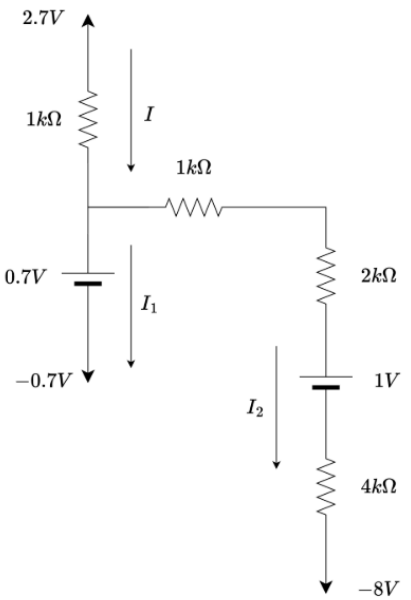
1. For the op-amp circuit shown below:
   (a) Draw the alternative representation. (ground node first…)
   (b) Given that $i^+ = 0$ A, write down the KCL equation at node V_x. Hence, find V_x.
   (c) What did you notice about the equation you wrote in part (b)? What rule is this?



2. Two circuits, in alternative representation, are shown below.
   (a) For the circuit on the left, find the values of V_a and V_b. Hence, write down the value of I (Any method is fine, either KCL or KVL. Avoid nodal and mesh.).
   (b) For the circuit on the right, find all unknown node voltages (mark all the nodes in the circuit first). Also, find the currents I, I_1, and I_2.





3. Design a device to implement the following function, f where x, y, and z are the inputs of the device. Assume any value if necessary.

$$f = \frac{d^2x}{dt^2} + 10y + \int (10z - 9)dt$$

4. Analyze the circuit in Figure-5, and determine the expression of the function, f where x, y and z are the input of the circuit.