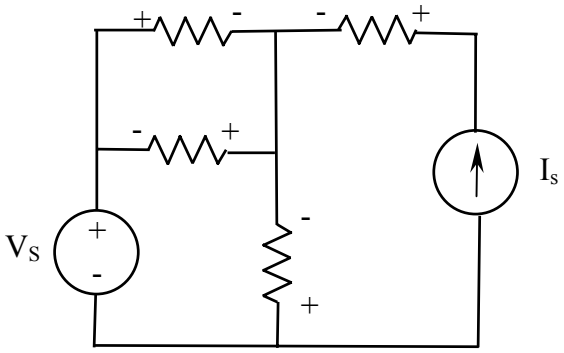
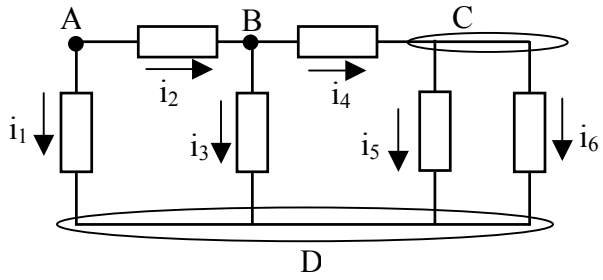
Note: **Do not use Mesh or Node analysis**. This homework set is meant to give you practice in using KVL, KCL, Ohm's law and the passive sign convention. All of your solutions should be neat and indicate which loop or node you are writing the equation for followed by the equation with variable, then one with numbers.

Problem 1

Using the passive sign convention, mark the polarity of the current source and the direction of current flow through the voltage source and resistors.

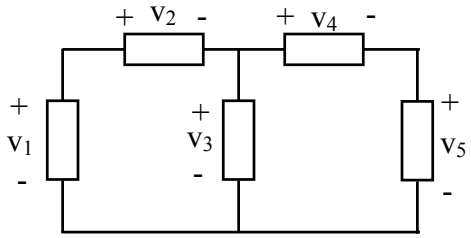


Problem 2



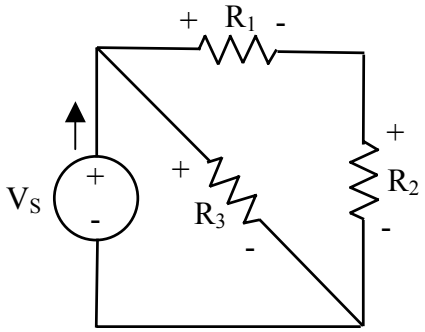
Given:
$i_1 = -1$ mA
$i_3 = 0.5$ mA
$i_6 = 0.2$ mA
Find:
Write KCL equations for nodes A, B, C, and D.
Solve for: i_2, i_4, and i_5
Use the extra equation to check your work.

Problem 3



Given:
v1 = 5 V
v2 = - 3 V
v4 = 10 V
Find:
Write KVL equations for all three loops
Solve for: v3, and v5
Use the extra equation to check your work

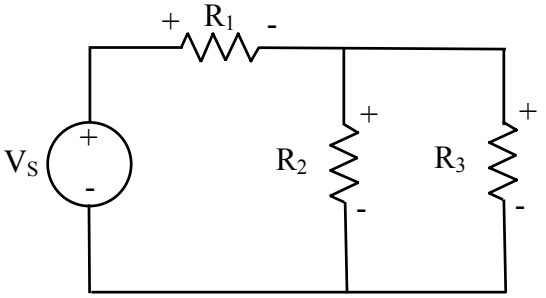
Problem 4



Given:
$V_s = 30$ V, $R_1 = 100\ \Omega$,
$R_2 = 200\ \Omega$, $R_3 = 300\ \Omega$
Find:
Ohm's law equations for each resistor.
Write KVL equations for all loops
Write KCL equations for all nodes
Solve for i_{VS}, i_{R1}, i_{R2}, i_{R3}, v_{R1}, v_{R2}, v_{R3}

Problem 5

Using KCL, KVL and Ohm's Law:



Given:
$V_s = 30$ V
$R_1 = 500\ \Omega$ $R_2 = 500\ \Omega$
$R_3 = 500\ \Omega$
Find:
1. The voltage across each resistor
2. The current through each resistor
3. The power added by the source
4. The power dissipated by each resistor.
5. Is the power added by the source equal to the sum of the power dissipated by the resistors?

Problem 6

1. Solve for I_1, I_2 and I_3
2. Show that KCL is valid for the supernode.