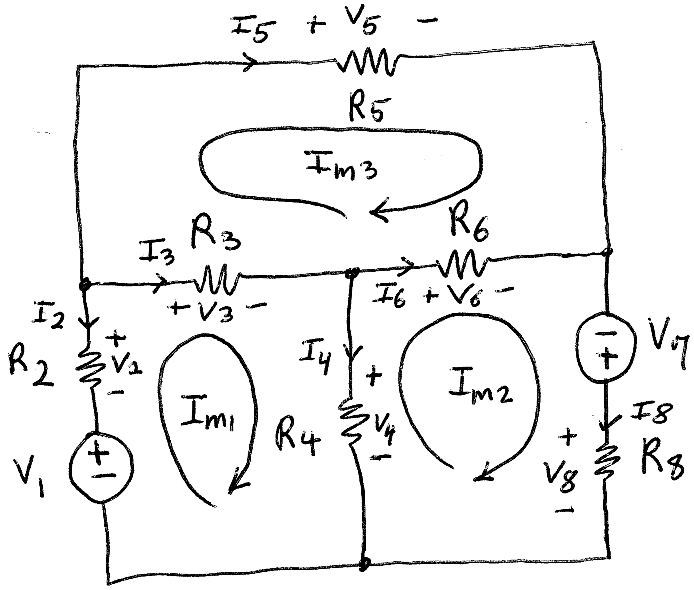
1. Mesh (Loop) Analysis



$V_1 = 10^V$, $V_7 = 70^V$
$R_2 = 200\Omega$
$R_3 = 300\Omega$
$R_4 = 400\Omega$
$R_5 = 500\Omega$
$R_6 = 600\Omega$
$R_8 = 800\Omega$

(a) Write three KVL equations in the circuit using loop currents I_{m1}, I_{m2}, I_{m3}.

(b) Solve for the mesh currents using $AX = Y$ where $X = [I_{m1}\ I_{m2}\ I_{m3}]^T$

(c) Determine the power dissipation of each component and show that the sum of the power dissipated equals zero. Best way to do this is to determine the currents through each element as a function of the mesh currents determined in (b). For example $I_3 = I_{m1} - I_{m3}$.

2. Nodal Analysis

$I_1 = 1A$, $I_8 = 8A$

$R_2 = 200\Omega$

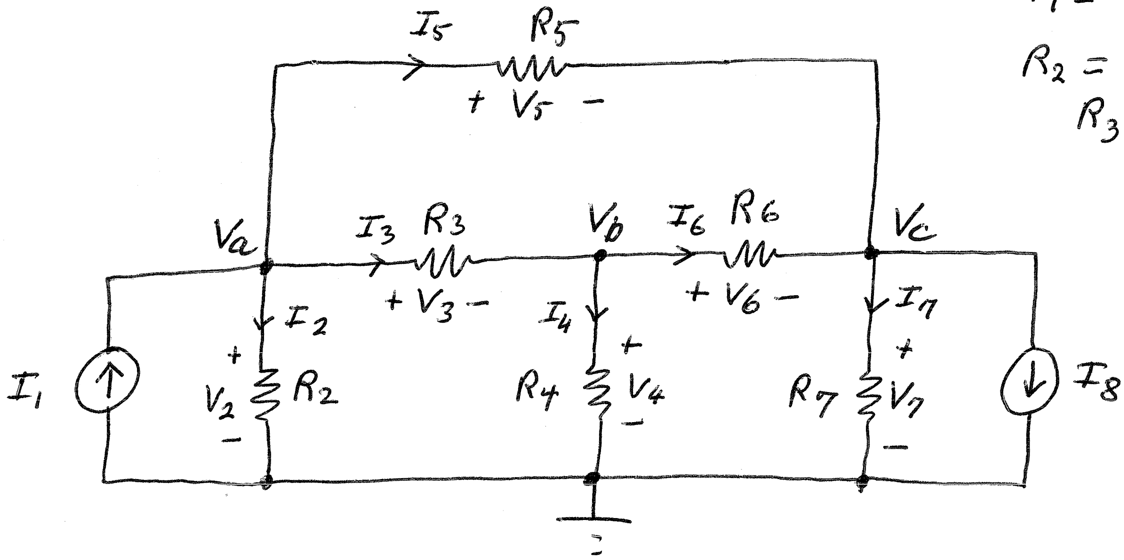
$R_3 = 300\Omega$

$R_4 = 400\Omega$

$R_5 = 500\Omega$

$R_6 = 600\Omega$

$R_7 = 700\Omega$



(a) Write 3 KCL equations in the circuit using the node voltages V_a, V_b and V_c.

(b) Solve for the node voltages using $AX = Y$ where $X = [V_a \; V_b \; V_c]^T$

(c) Determine the power dissipation of each component and show that the sum equals zero. Best way to do this is to determine the voltage across each element. For example, $V_6 = V_b - V_c$ using the node voltages determined in (b).