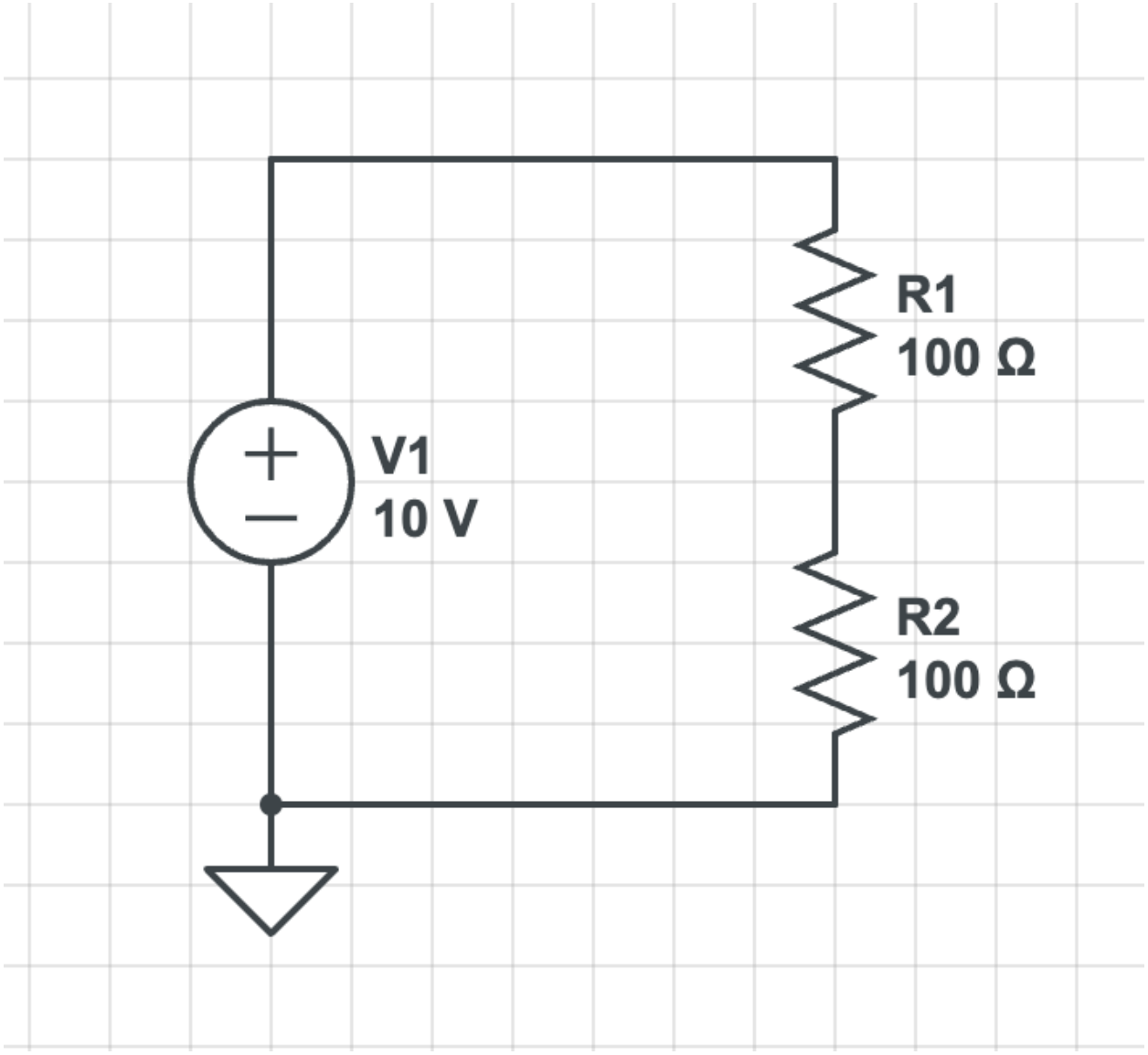
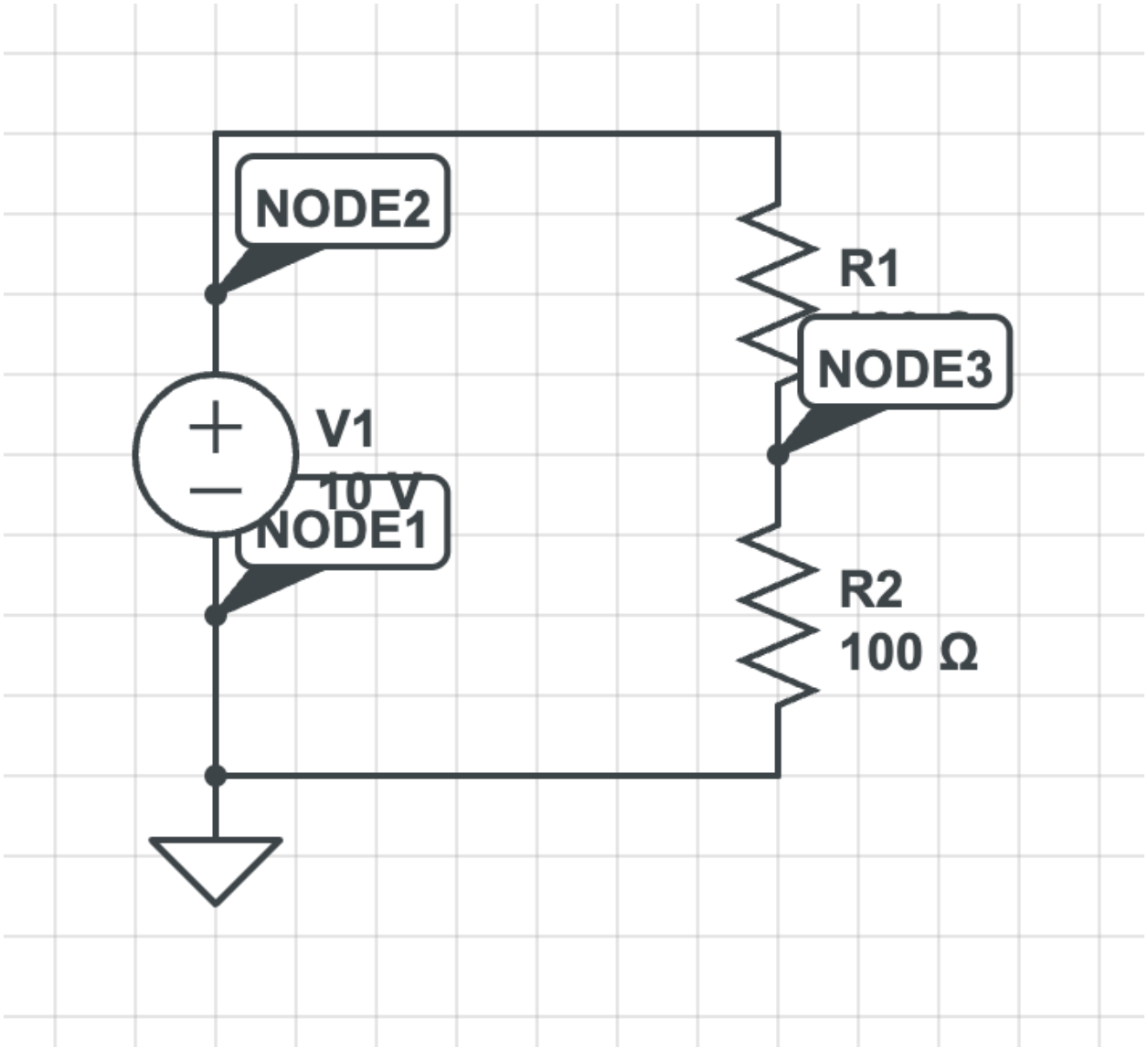
(NOTE: the problems are out of order: 1,3,5,7,2,4,6)

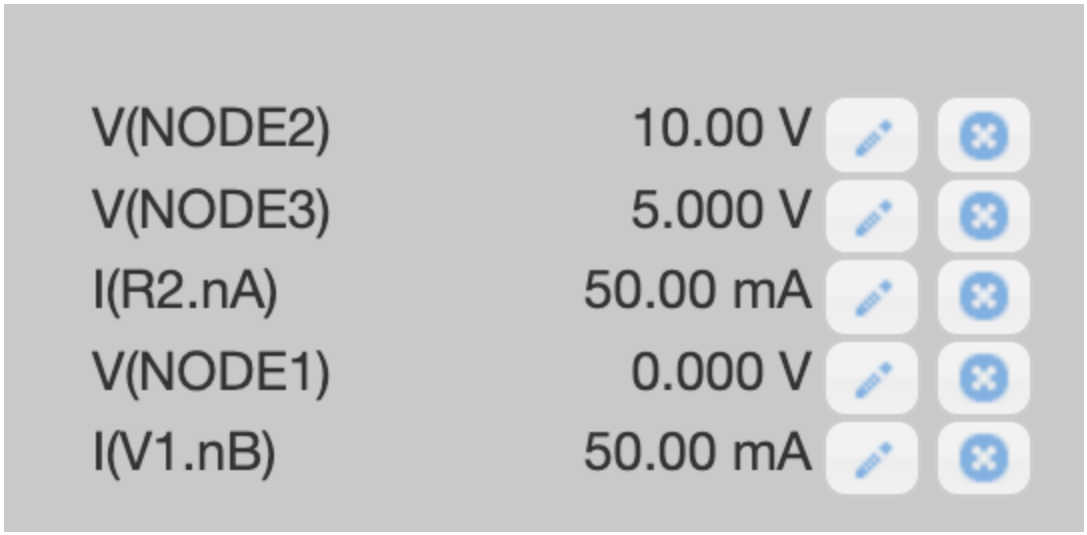
Problem 1. a.



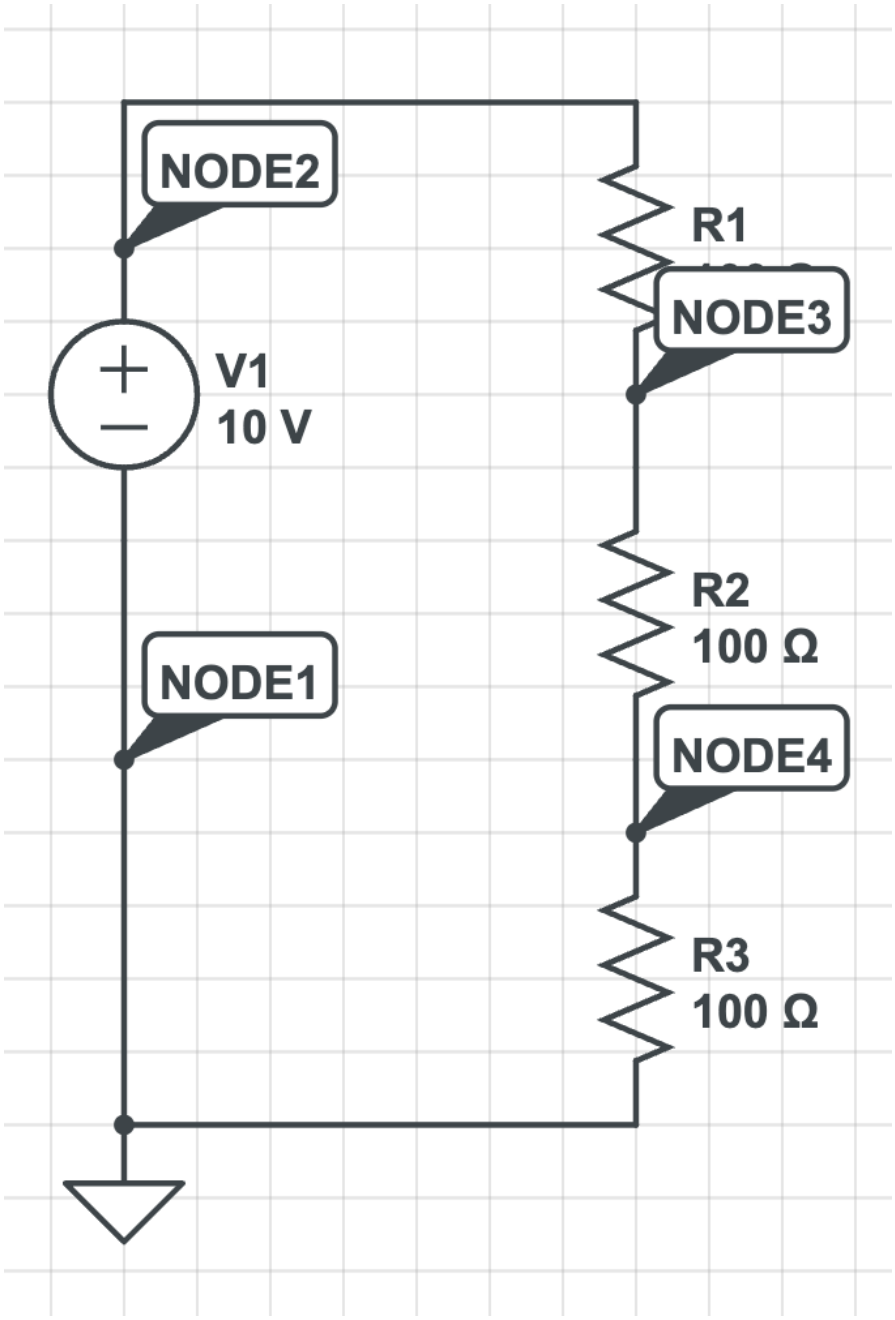
b.



c.

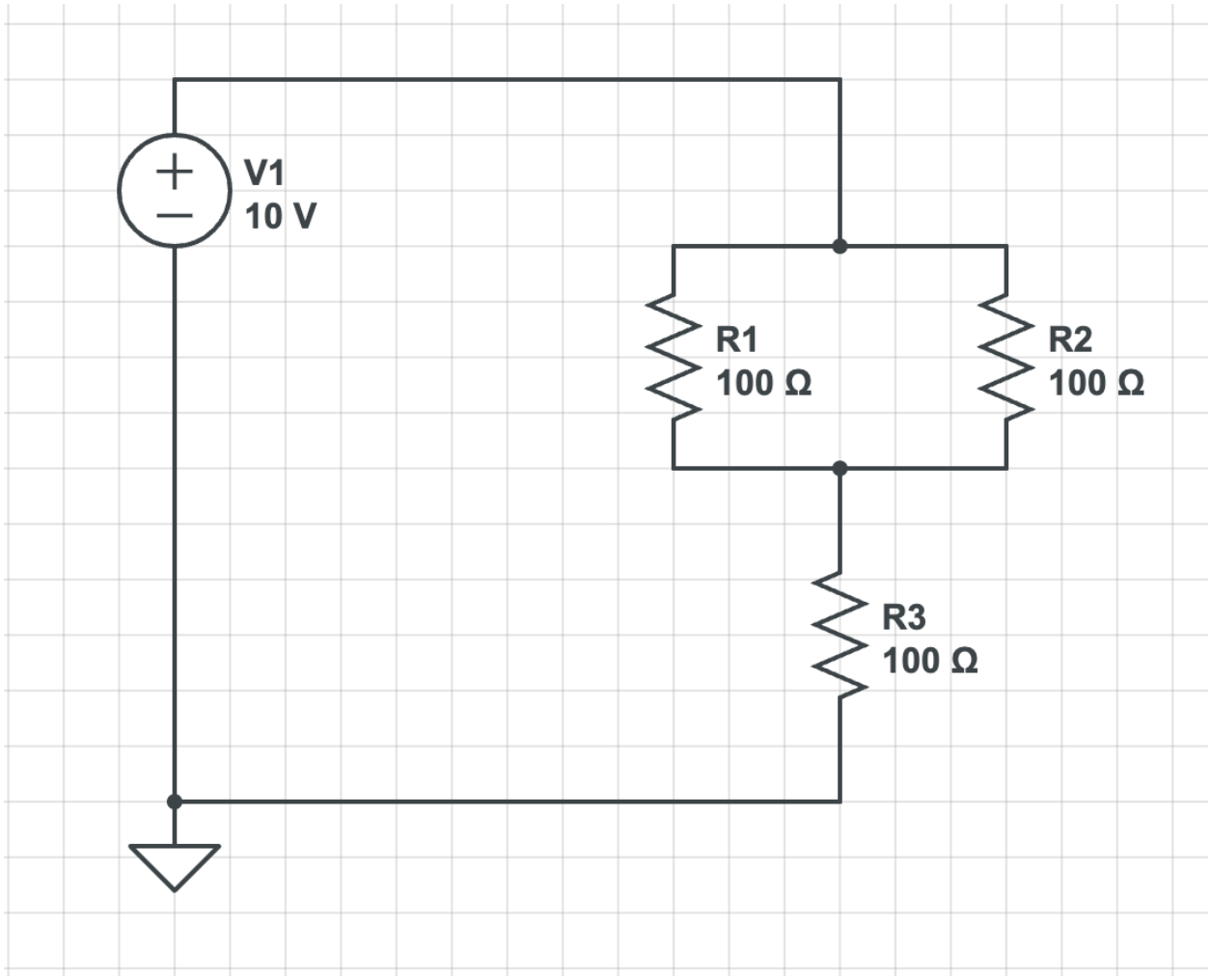

V(NODE2) 10.00 V
V(NODE3) 5.000 V
I(R2.nA) 50.00 mA
V(NODE1) 0.000 V
I(V1.nB) 50.00 mA

d.

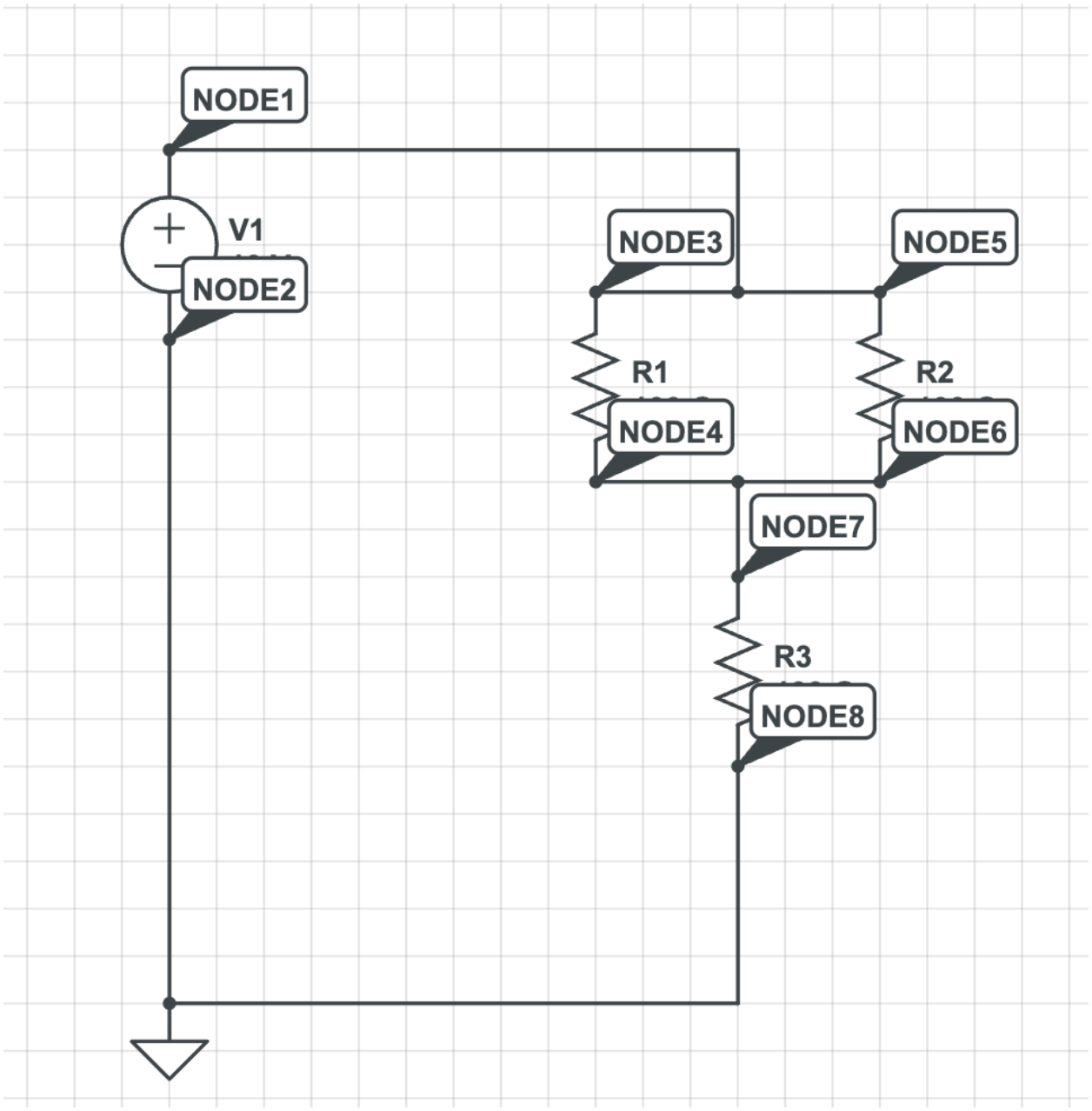


The overall current in the circuit decreases and the voltage across each resistor also decreases.

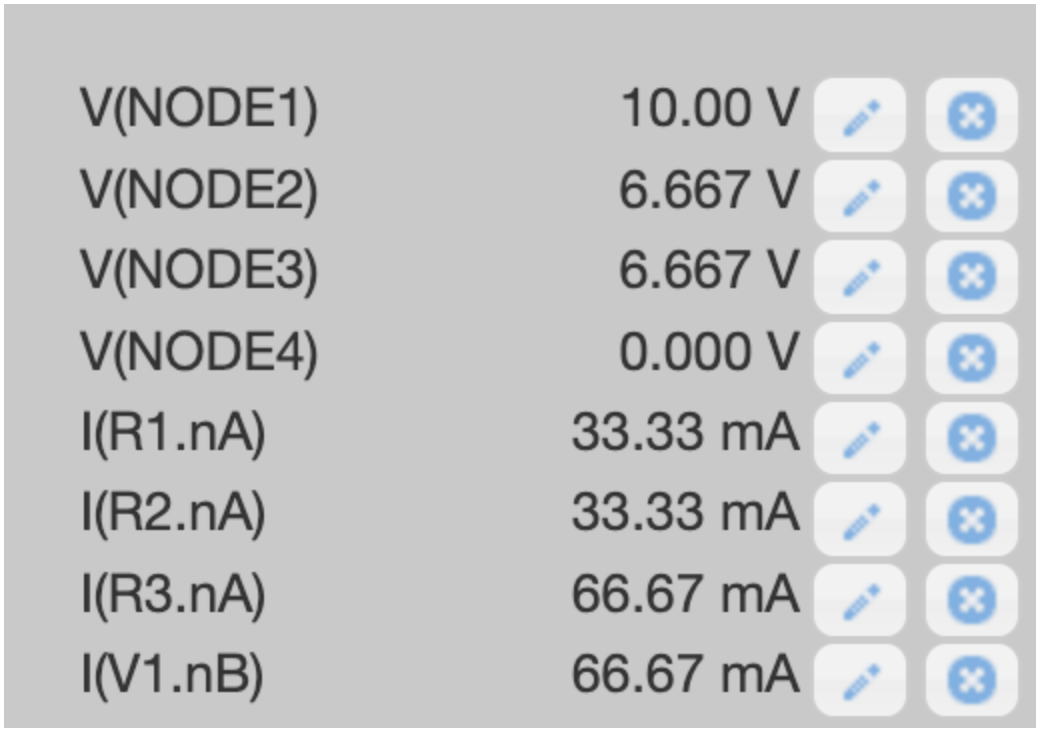
Problem 3. a.



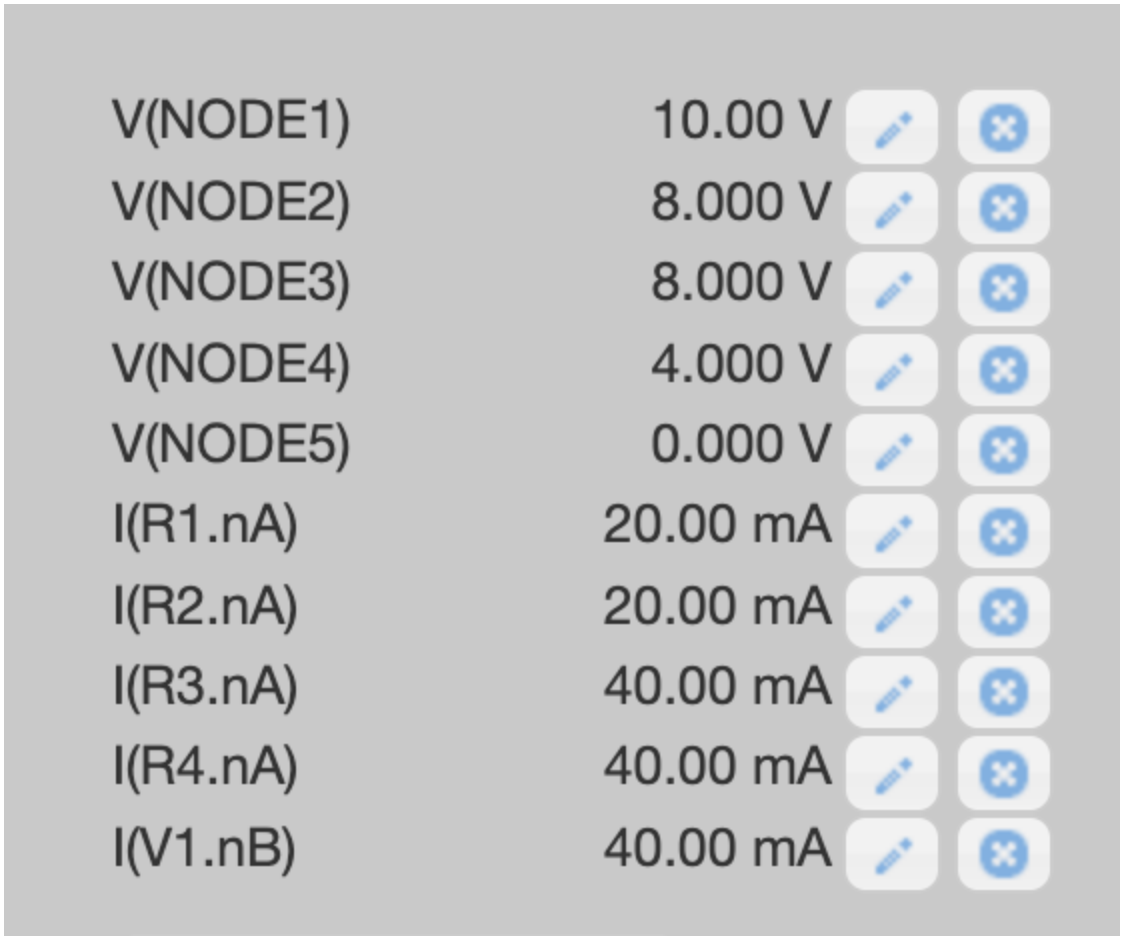
b.



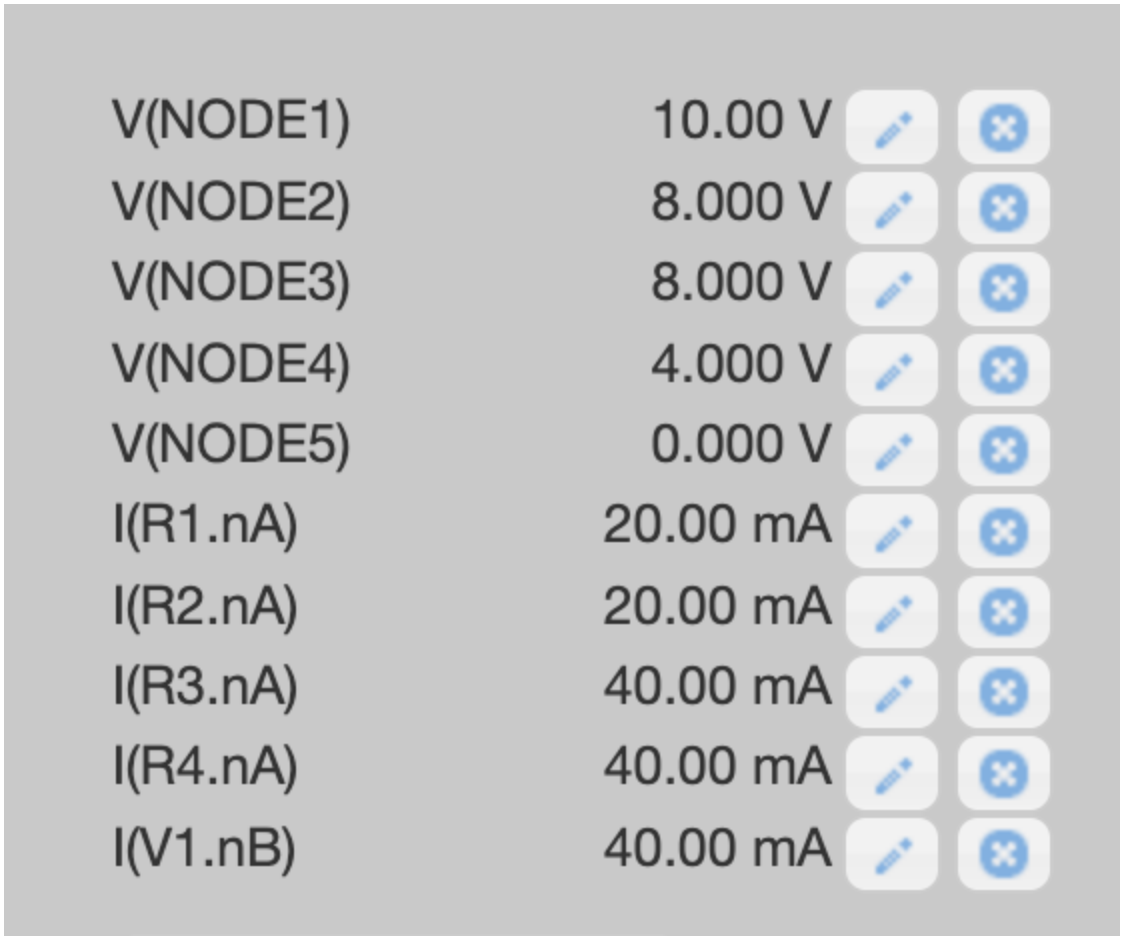
c.


V(NODE1) 10.00 V
V(NODE2) 6.667 V
V(NODE3) 6.667 V
V(NODE4) 0.000 V
I(R1.nA) 33.33 mA
I(R2.nA) 33.33 mA
I(R3.nA) 66.67 mA
I(V1.nB) 66.67 mA

d.

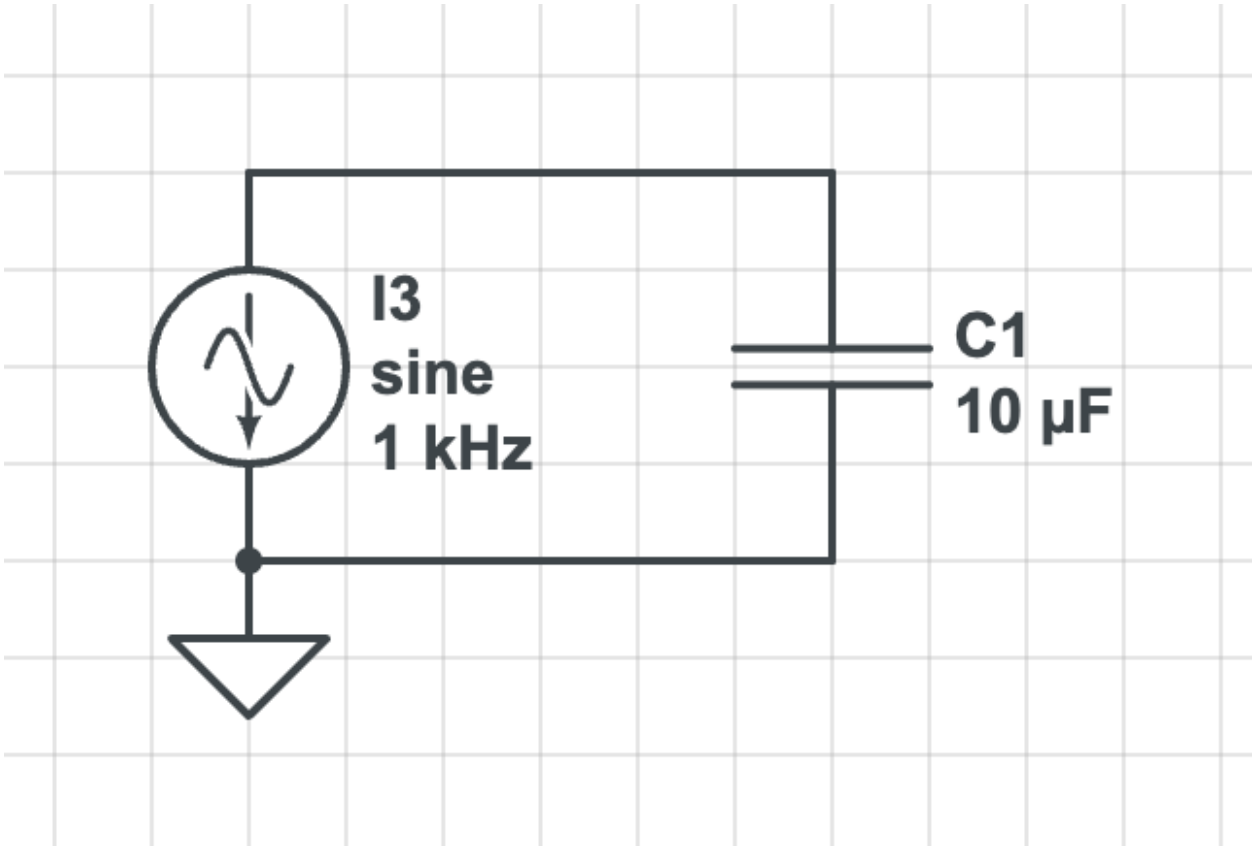


Voltage across both the parallel and series resistors decreased. Current flowing through each resistor also decreased.


V(NODE1) 10.00 V
V(NODE2) 8.000 V
V(NODE3) 8.000 V
V(NODE4) 4.000 V
V(NODE5) 0.000 V
I(R1.nA) 20.00 mA
I(R2.nA) 20.00 mA
I(R3.nA) 40.00 mA
I(R4.nA) 40.00 mA
I(V1.nB) 40.00 mA

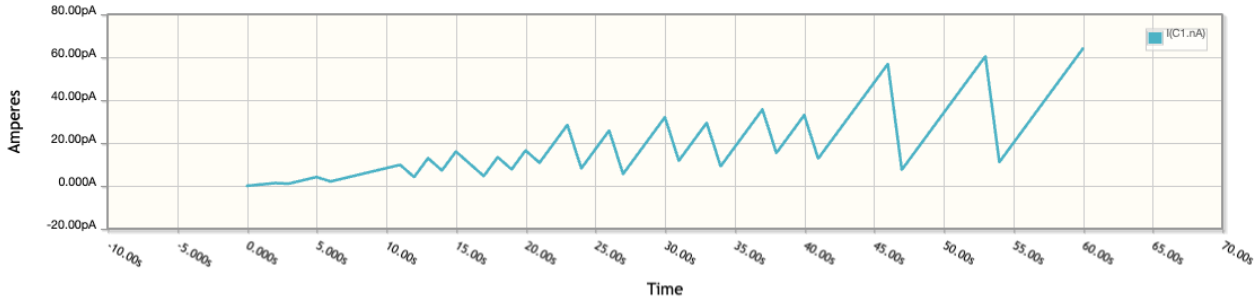
Problem 5:

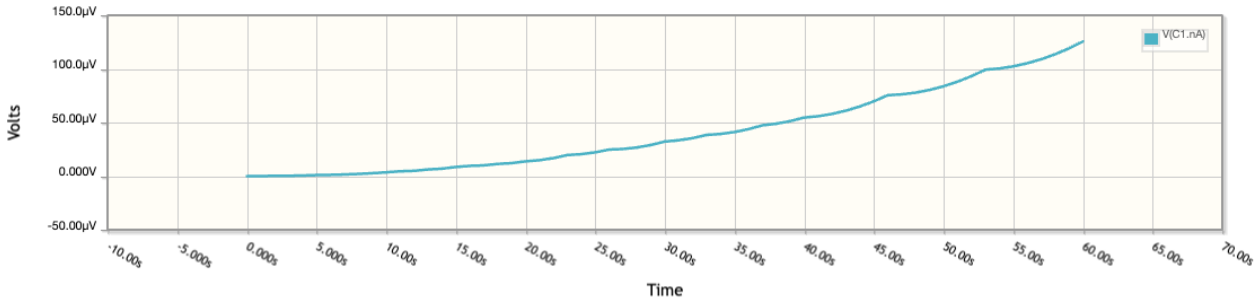
a.


I3
sine
1 kHz
C1
10 µF

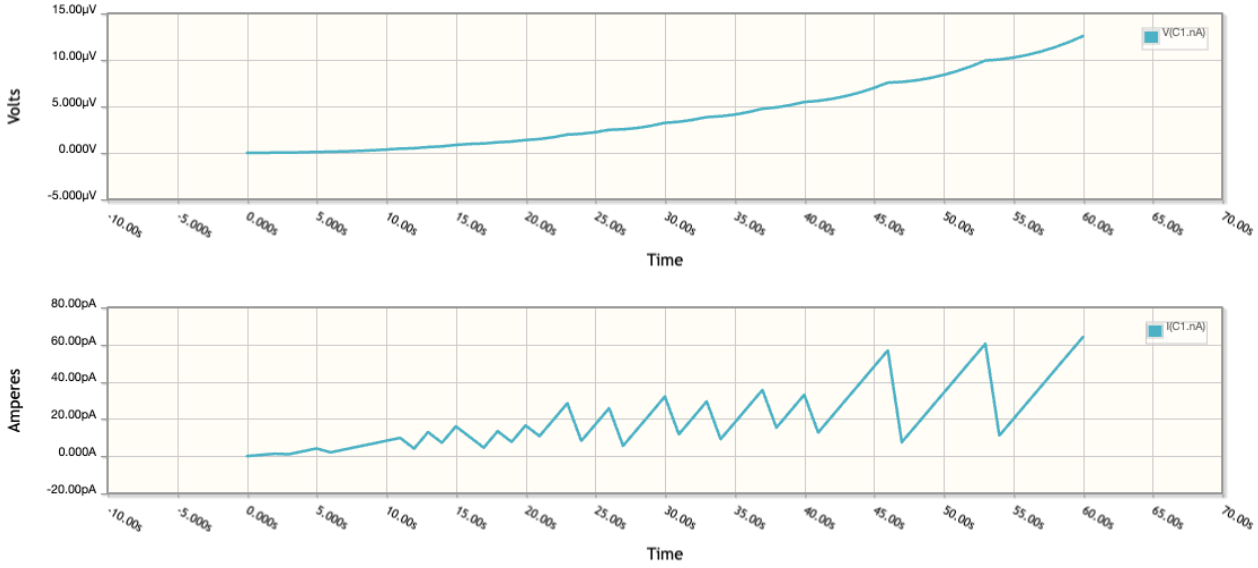
b.

10 uF


80.00pA
60.00pA
40.00pA
20.00pA
0.000A
-20.00pA
Amperes
I(C1:nA)
-10.00s
-5.000s
0.000s
5.000s
10.00s
15.00s
20.00s
25.00s
30.00s
35.00s
40.00s
45.00s
50.00s
55.00s
60.00s
65.00s
70.00s
Time


150.0µV
100.0µV
50.00µV
0.000V
-50.00µV
Volts
V(C1:nA)
-10.00s
-5.000s
0.000s
5.000s
10.00s
15.00s
20.00s
25.00s
30.00s
35.00s
40.00s
45.00s
50.00s
55.00s
60.00s
65.00s
70.00s
Time

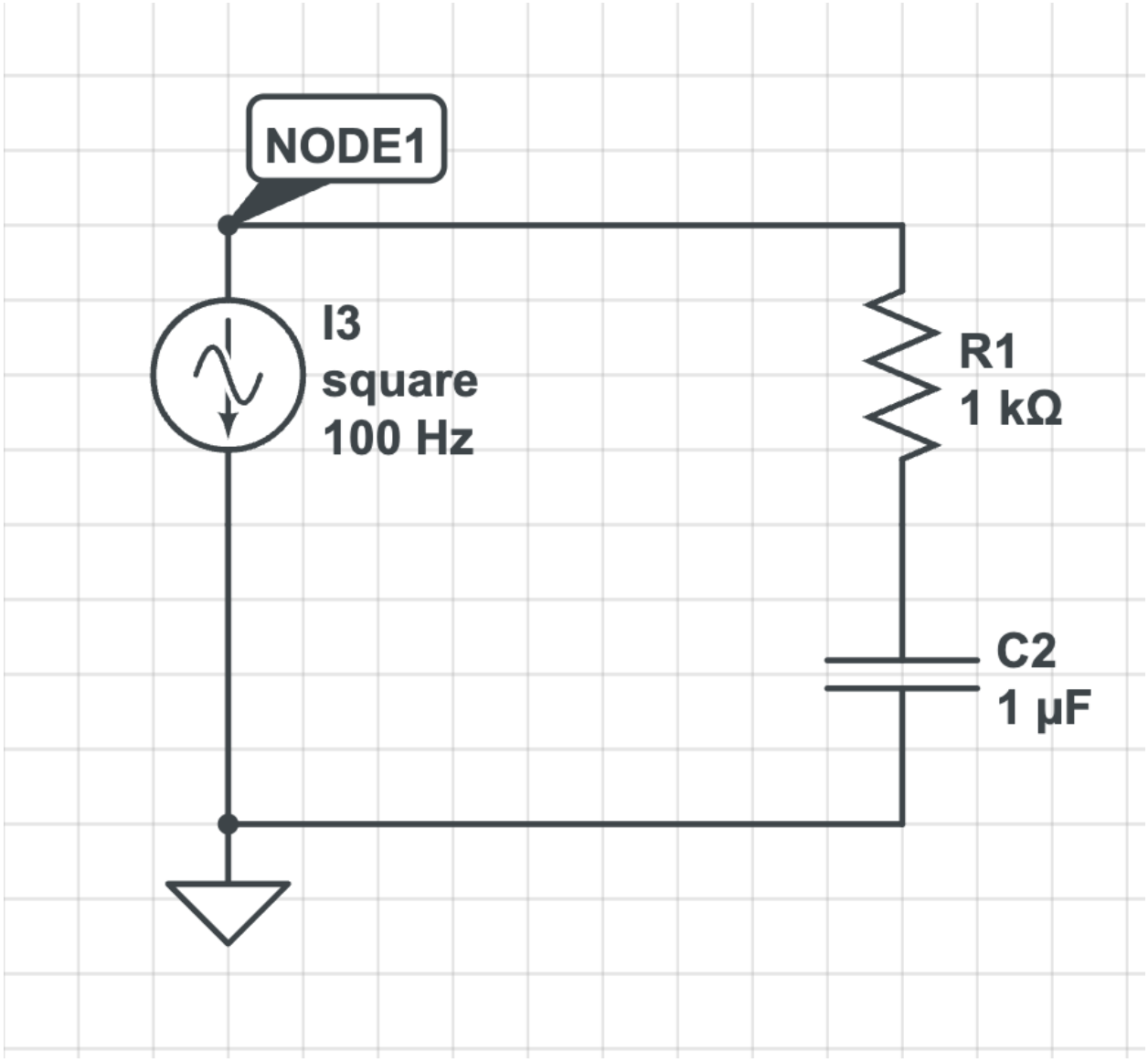
100uF



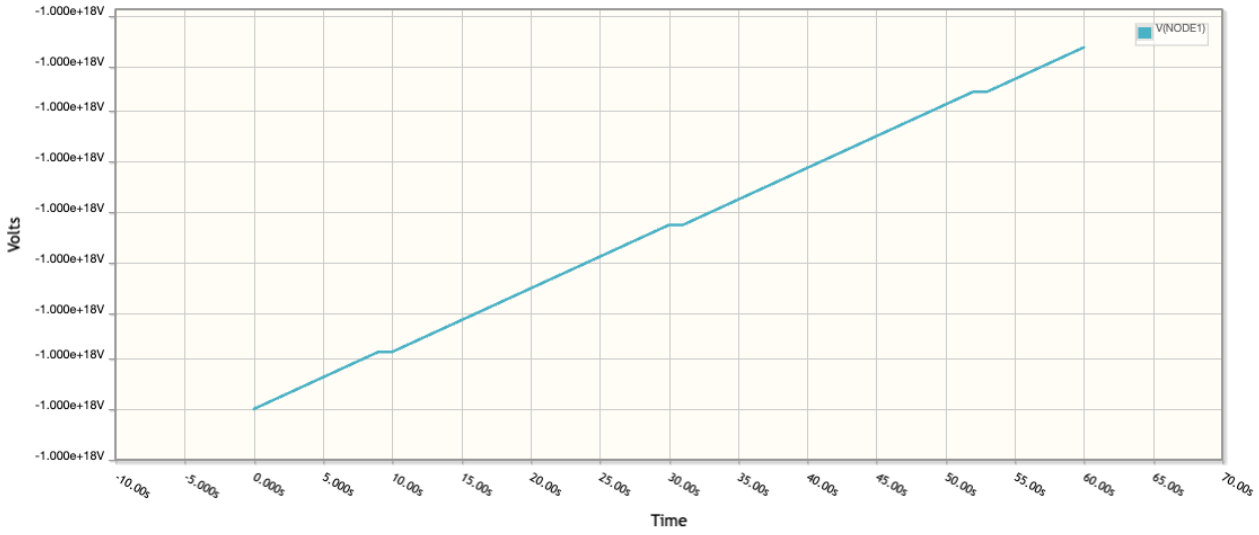
Increasing capacitance slows the buildup of voltage but does not change the current.

Problem 7:

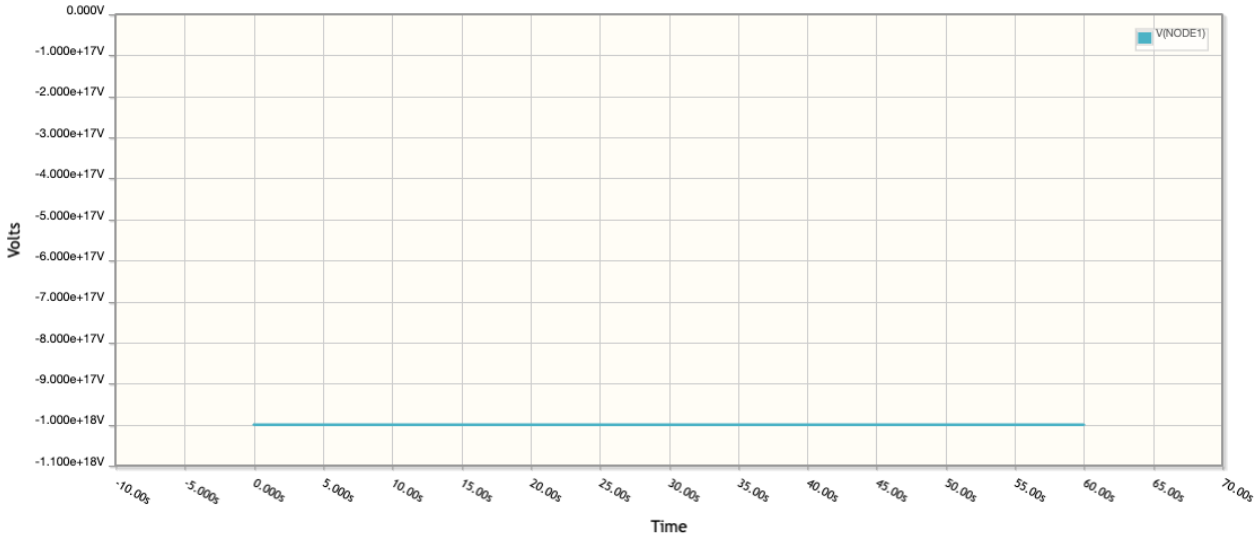
a.



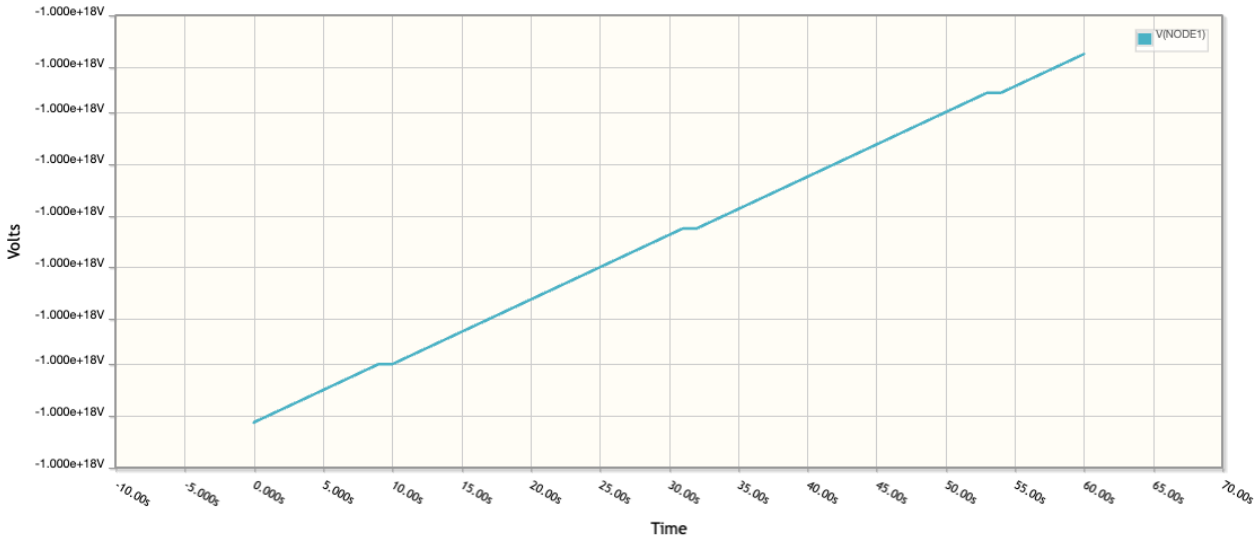
b.



100uF:

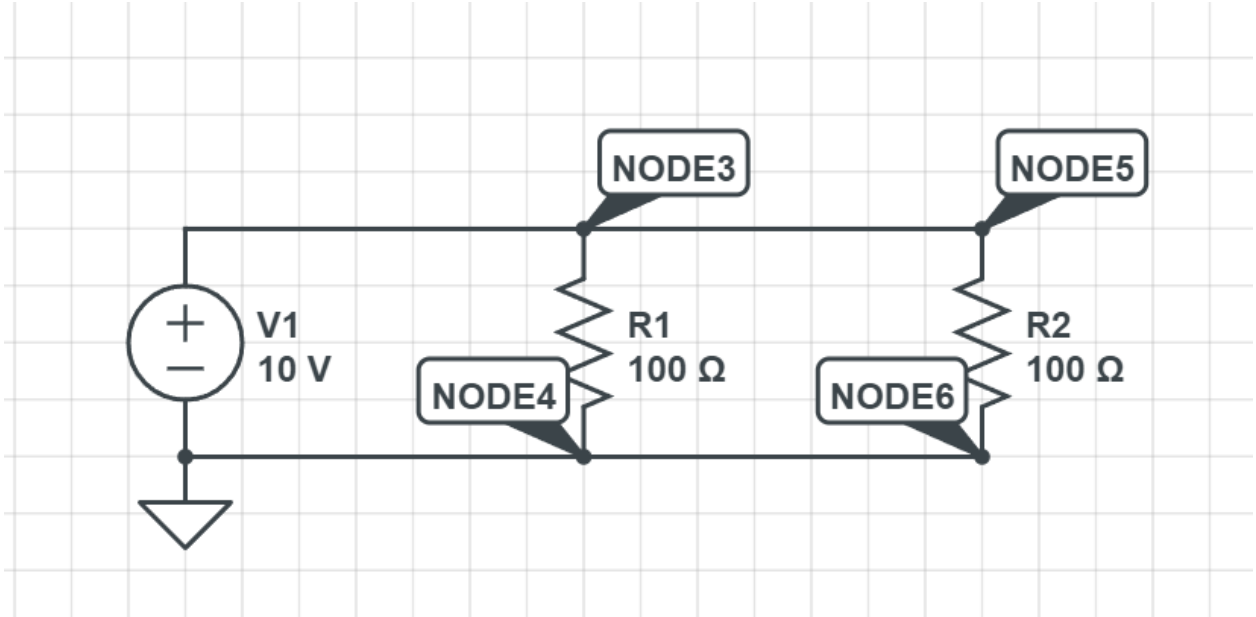


100 Ohms:



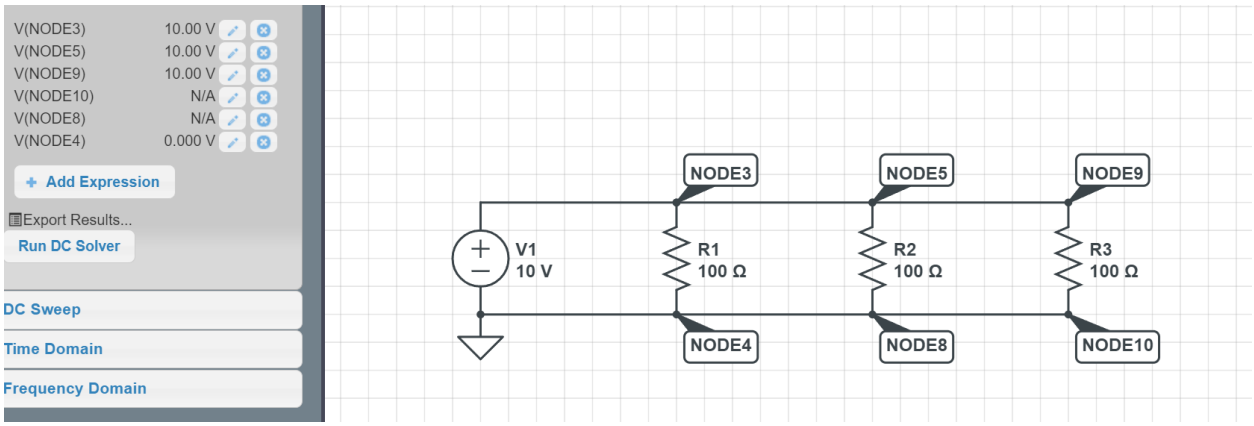
Increasing the capacitance decreases the voltage buildup over time, decreasing resistance does not seem to have any affect.

2. Resistors in parallel

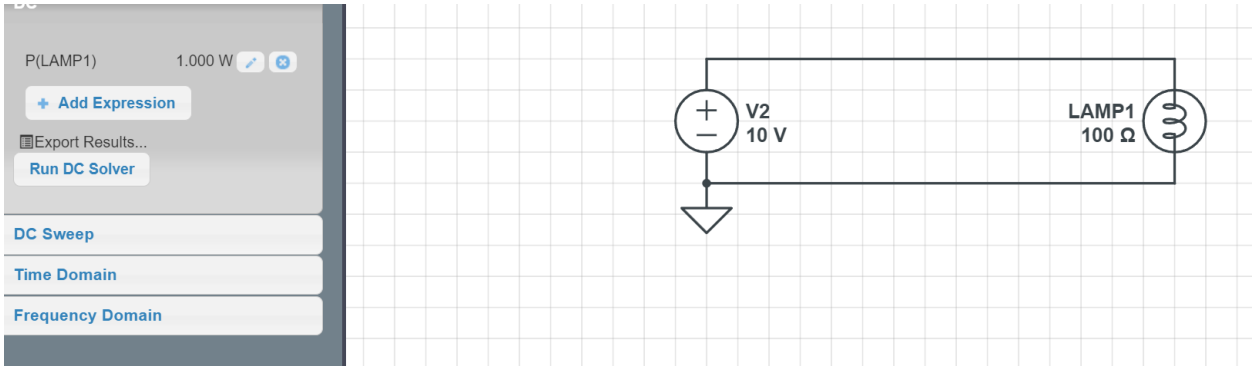


V(NODE3)	10.00 V
V(NODE5)	10.00 V
V(NODE4)	0.000 V
V(NODE8)	N/A

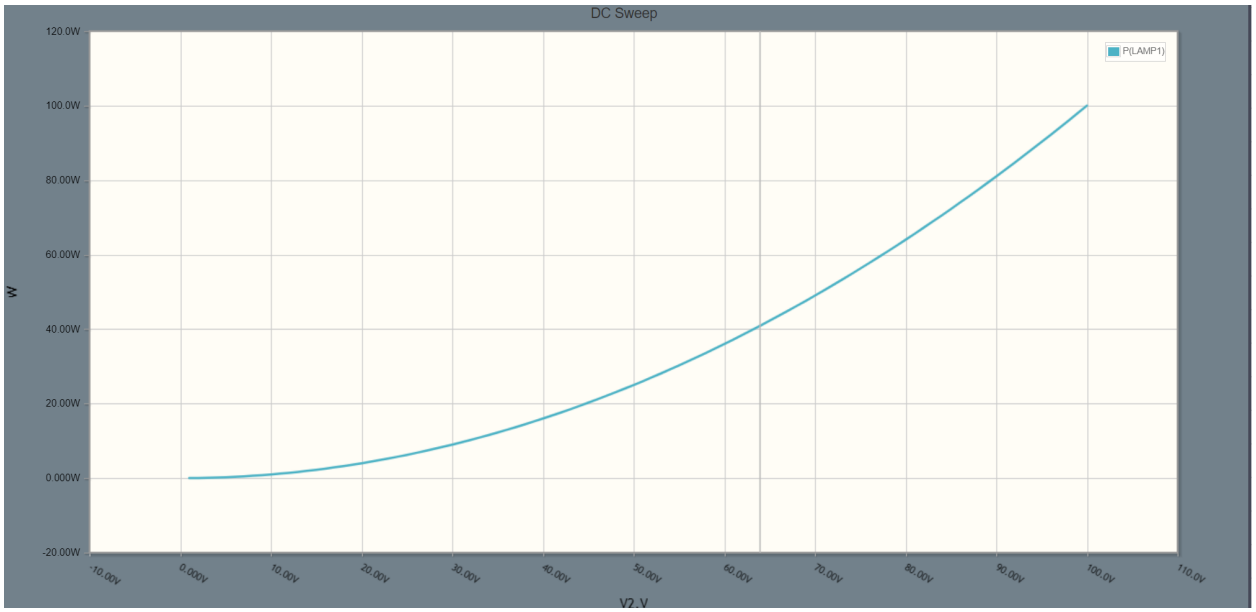
The voltage at each node does not change from the upper and lower part of the circuit with the addition of more resistors



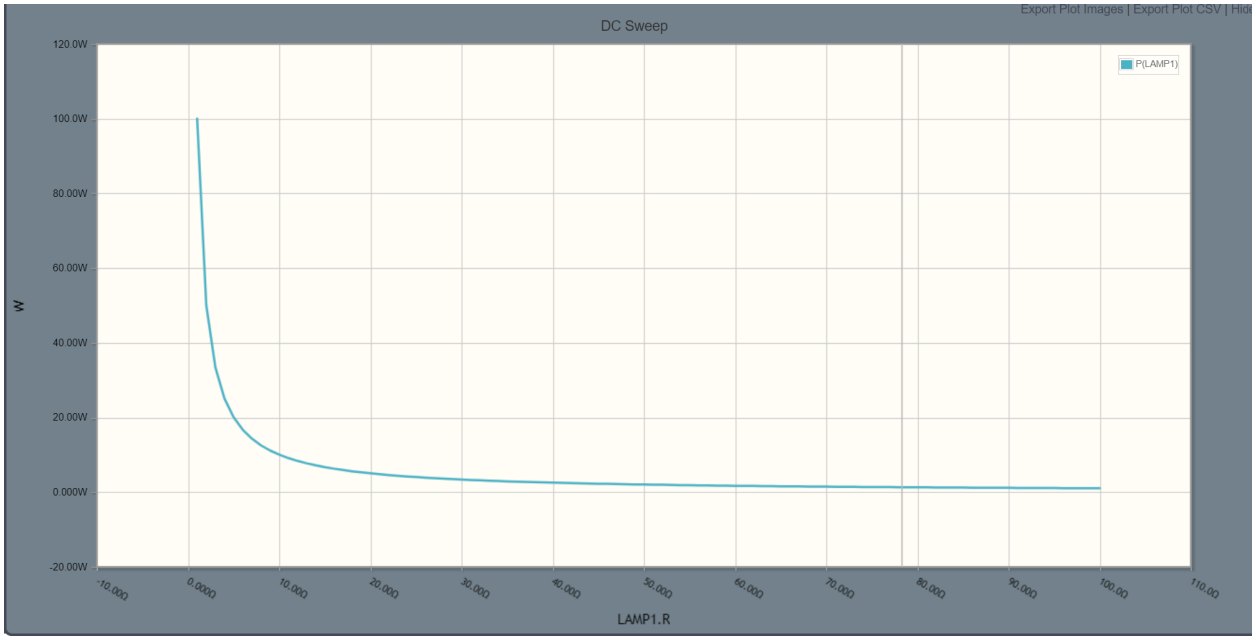
4. Powering Light bulbs



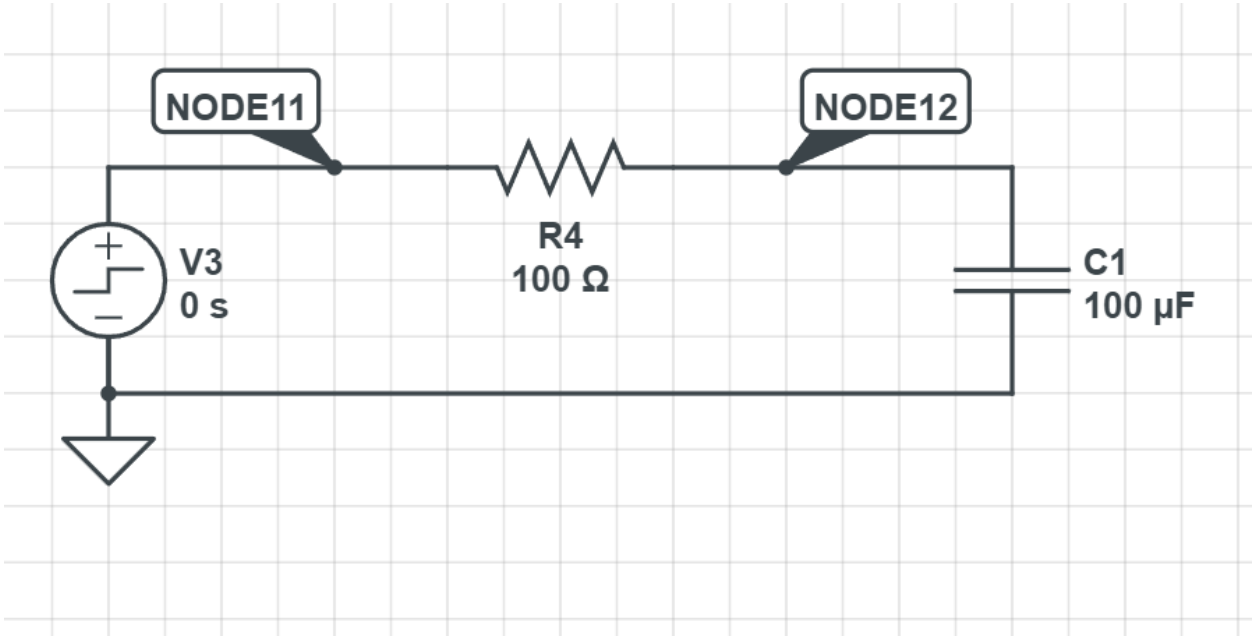
Power versus increasing Lamp resistance

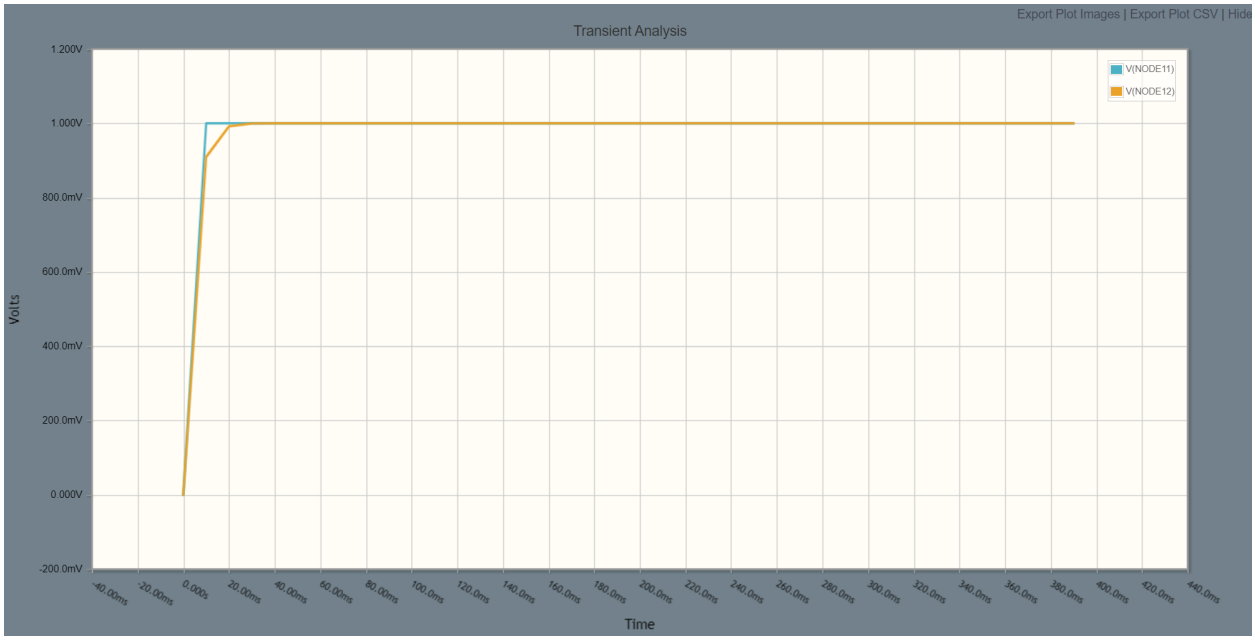


Power vs increasing Lamp resistance

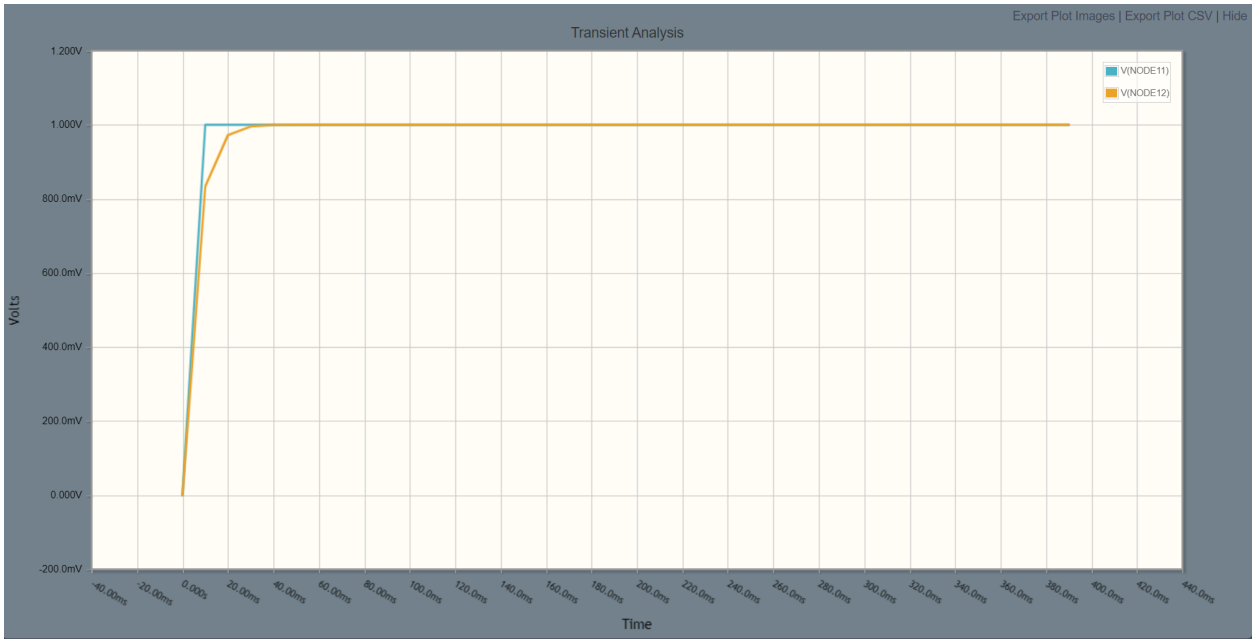

Export Plot Images | Export Plot CSV | Hide
DC Sweep
P(LAMP1)
120.0W
100.0W
80.00W
60.00W
40.00W
20.00W
0.000W
-20.00W
W
-10.000
0.0000
10.000
20.000
30.000
40.000
50.000
60.000
70.000
80.000
90.000
100.00
110.00
LAMP1.R

Question 6

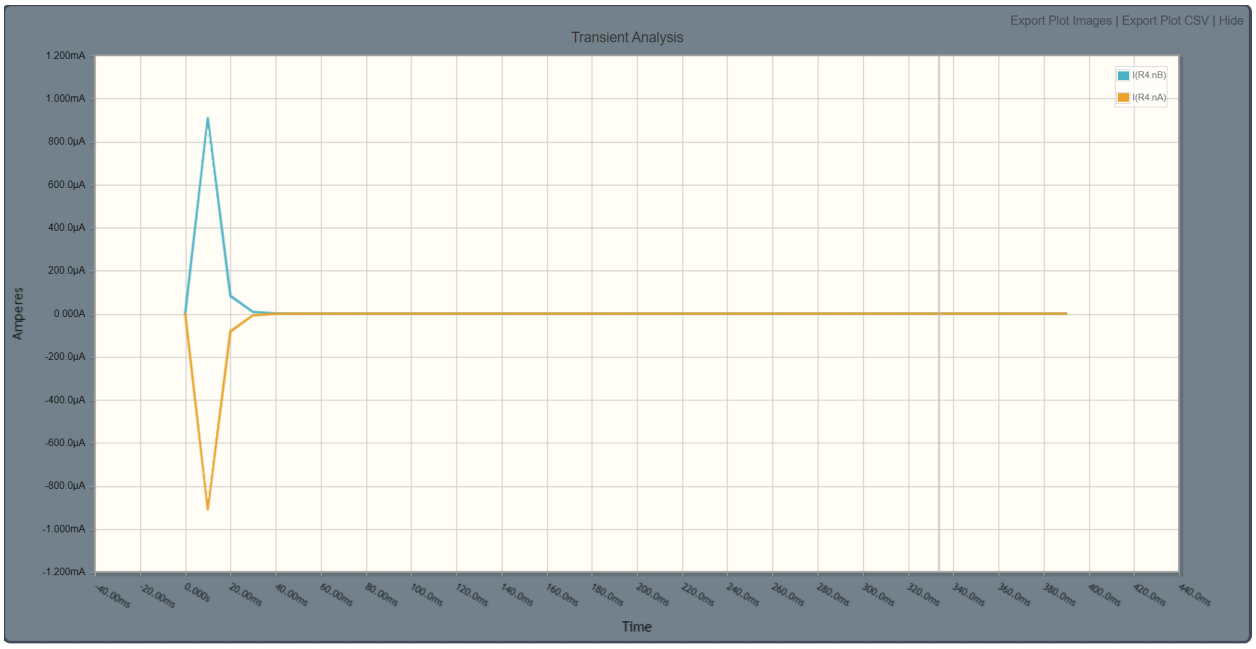

NODE11
NODE12
V3
0 s
R4
100 Ω
C1
100 µF



Voltage vs time at higher resistance, 200 Ohms instead of 100, standard capacitance



Current and time, standard conditions 10 uF 100 ohm



Voltage vs time at higher capacitance 100uF versus 10 uF, standard resistance