

ECE 111 - Homework #5

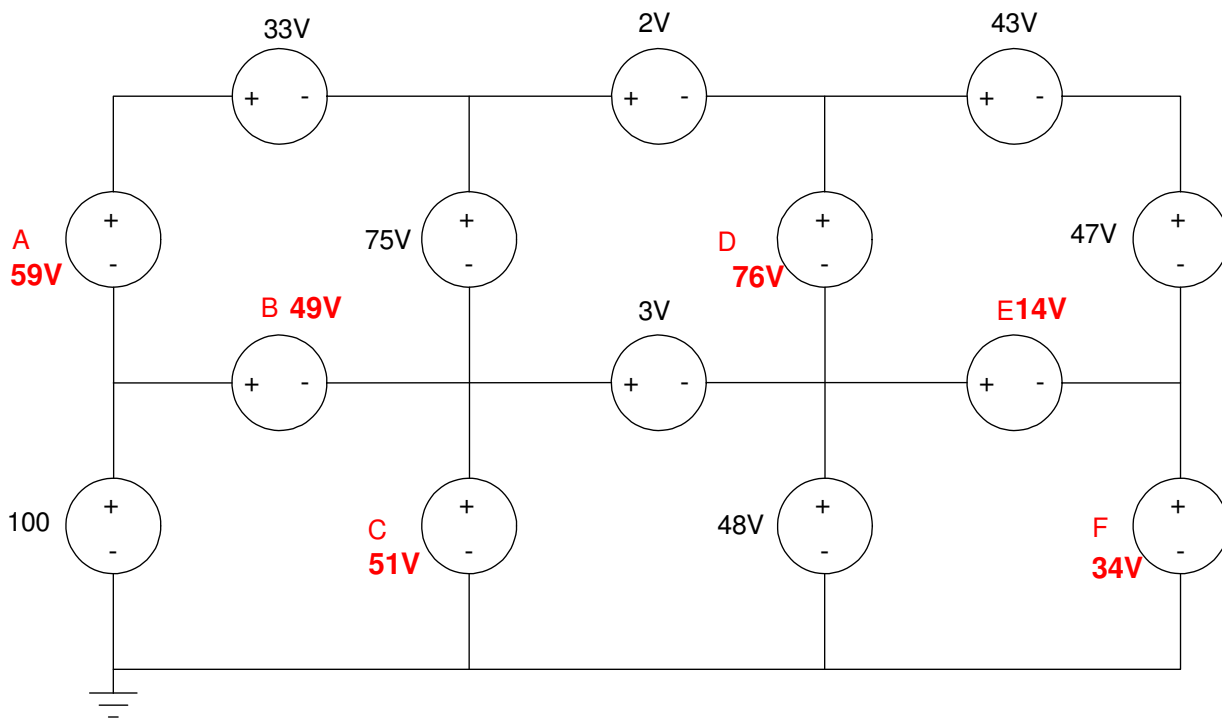
Week #5: EE 206 Circuits I

1) A resistor has the following volts / amps / resistance / power. Determine the missing parameters:

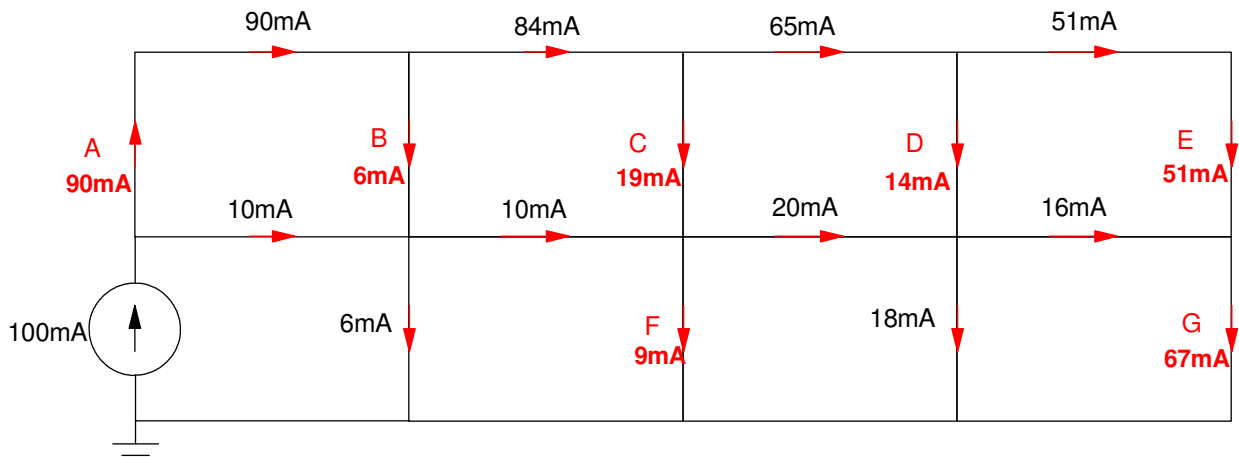
Volts	Amps	Ohms	Watts
12V	2.5A	4.8	30.0
12V	1.50	8	18.0
80.0	2.5A	32.0	200
12V	4.167	2.88	50

Kirchoff's Laws:

2) Use conservation of voltage to determine the unknown voltages

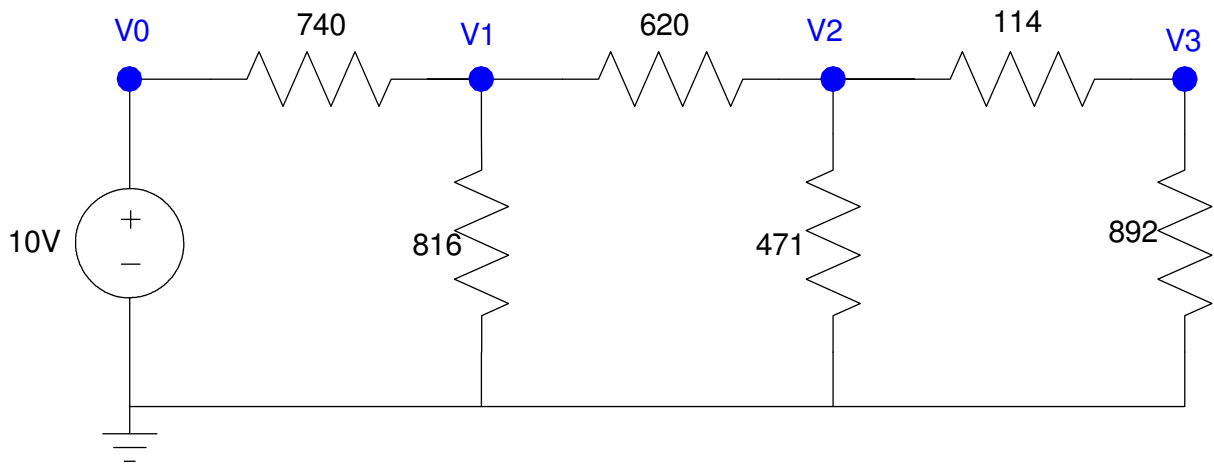


3) Use conservation of current to determine the unknown currents



Resistors in Series and Parallel

4) Find the total resistance seen by the 10V source



$$114 + 892 = 1006$$

$$1006 \parallel 471 = 320.803$$

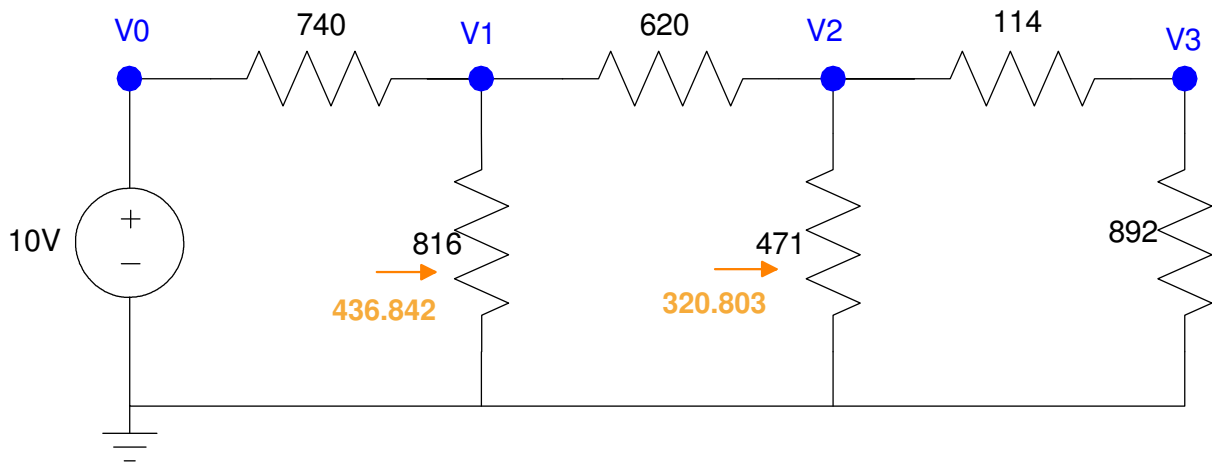
$$320.803 + 620 = 940.803$$

$$940.803 \parallel 816 = 436.842$$

$$436.842 + 740 = 1176.9842$$

ans: **1176.9842 Ohms**

5) Use voltage division to find V1, V2, and V3.



From problem #5, the resistance at V1 looking right is 436.842 Ohms

$$V_1 = \left(\frac{436.842}{436.842+740} \right) 10V = 3.712V$$

From problem #5, the resistance at V2 looking right is 320.803 Ohms

$$V_2 = \left(\frac{320.803}{320.803+620} \right) 3.712V = 1.2657V$$

The voltage at V3 is then

$$V_3 = \left(\frac{892}{892+114} \right) 1.2657 = 1.1223V$$

6) Use CircuitLab to find V1, V2, and V3.

