

Inter American University of Puerto Rico
Bayamón Campus
School of Engineering
Department of Electrical Engineering

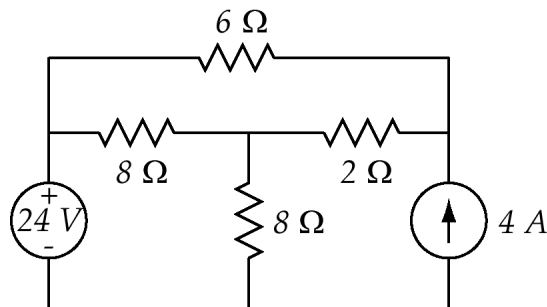
ELEN 3301 – Electric Circuits I

Problem Set 1

Due Wednesday, August 25

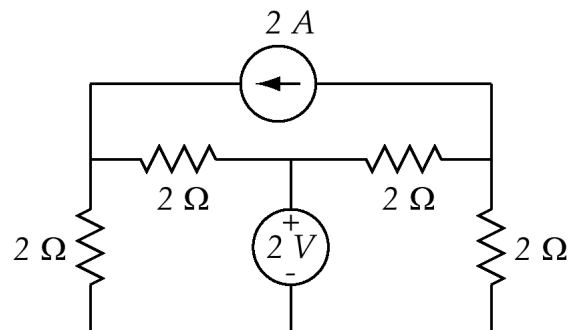
Problem 1:

(A) Solve for the current and voltages of every branch in the following circuit:



(B) Check that power is conserved by computing the power in each branch and adding all the branches.

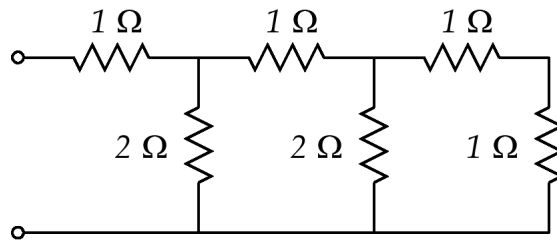
(C) Repeat parts (A) and (B) for the following circuit:



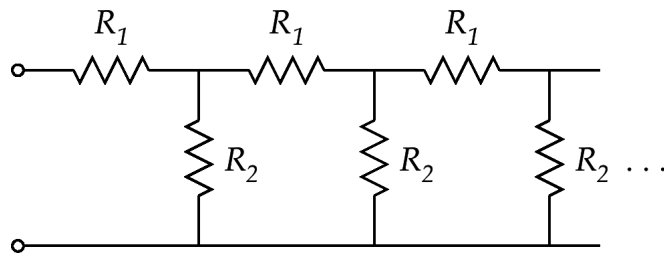
(D) Now, multiply the voltages you obtained in part (A) by the currents you obtained in part (C), associating corresponding branches and add the result. Can you explain this result?

Problem 2:

(A) Evaluate the resistance between the terminals of the ladder circuit shown below:



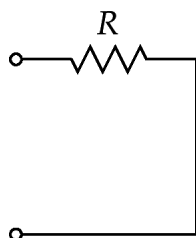
(B) Generalize the equivalent resistance of an infinite ladder circuit:



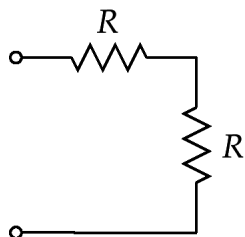
(C) Evaluate the result obtained in the previous part for the following cases. For cases (ii) and (iii), interpret the result by drawing a circuit which represents the given condition.

- (i) $2R_1 = R_2$
- (ii) $R_1 \gg R_2$
- (iii) $R_1 \ll R_2$
- (iv) $R_1 = R_2$

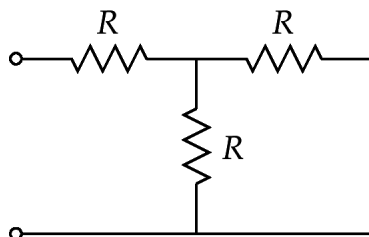
- (D) Can you recognize the number in condition (iv) of the previous part? Evaluate the equivalent resistance for each circuit in the series below. Can you identify this sequence? Can you relate the number in condition (iv) to this sequence?



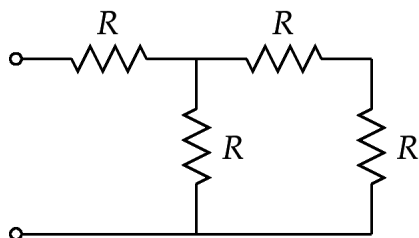
(a)



(b)



(c)



(d)