Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

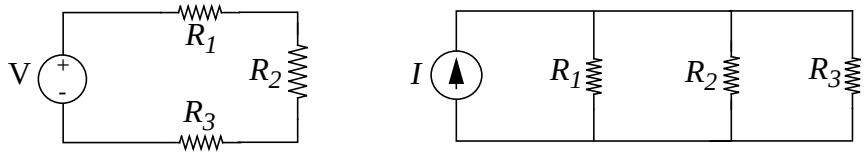
6.002 - Electronic Circuits
Spring 2007

Homework #1
Handout S07-011

Issued 02/08/2007 - Due 02/16/2007

Helpful readings for this homework: Chapter 1, Chapter 2.1-2.5

Exercise 1-1: For both networks shown below, find the voltage across and the current through each element in the network. Be sure to make the polarity of the voltages and currents clear. Also, find the power generated or dissipated by each network element, and show that energy is conserved in total over the network.

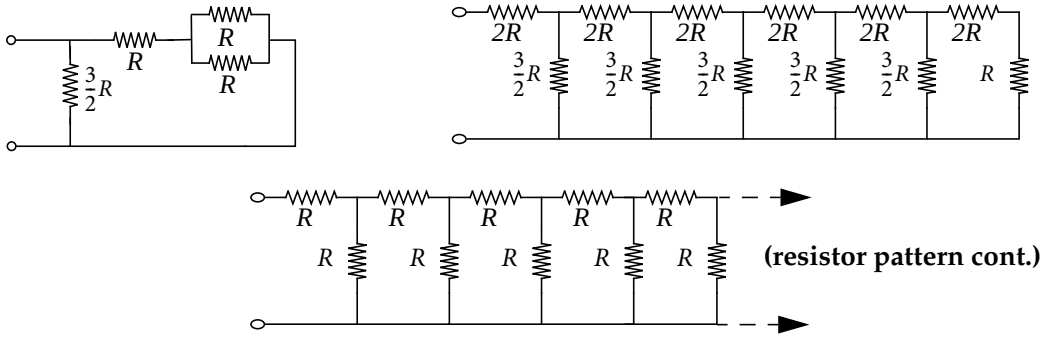


Exercise 1-2: Using only 1k resistors, synthesize a resistor of 3/5k and a resistor of 5/3k. Use no more than four 1k resistors in each case.

Exercise 1-3: Exercise 2.7 from Chapter 2 of A&L (page 110).

Problem 1-1: Problem 2.7 from Chapter 2 of A&L (page 113).

Problem 1-2: Find the equivalent resistance of the following networks as viewed from their ports. (Hint: Try using an intuitive approach for this problem)



Problem 1-3: You are given a black box with three terminals, as shown below. The box is known to contain five 1-ohm resistors.

Using an ohm-meter, you measure the resistance between the terminals to be the following:

A - B: 1.5 ohms
B - C: 3 ohms
A - C: 2.5 ohms

Determine the configuration of the five resistors inside the box.