# ECE103
Fall 2012

Homework 2

Due Tuesday, September 17th at 11 AM sharp. Either hand in your HW to me in class or to me at my office (ENGR C101F or drop your work into the white box located in the Engineering building B/C Infill Area (ENGR B106) in the slot labeled "ECE103".

Show all your work, all problems must be properly solved and assumptions justified. A list of results is NOT acceptable. Solve the homework on separate sheets of paper. Do not use this page for your homework solutions.

1- Find the power absorbed or supplied by each of the elements in the figure.
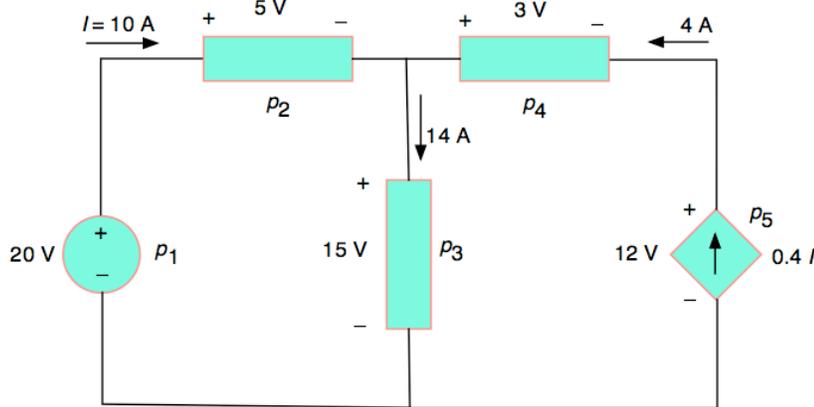
2- For the circuit shown in the figure,
a) determine which components are absorbing power and which are delivering power.
b) Is conservation of energy satisfied? Justify your answer
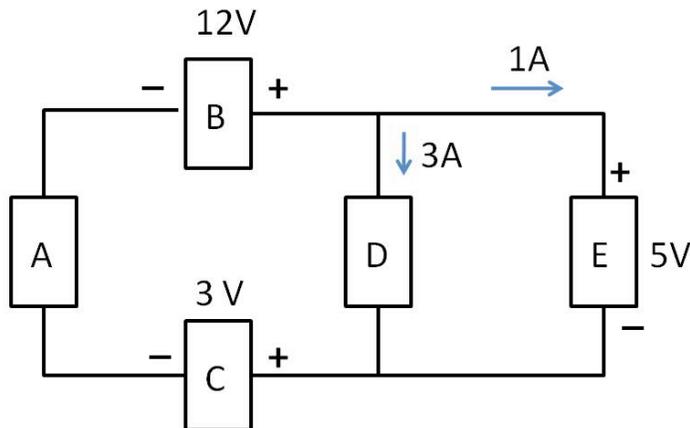
3- The element current and voltages shown in the figure are correct with one exception. Find the exception and justify your answer via KCL and/or KVL.
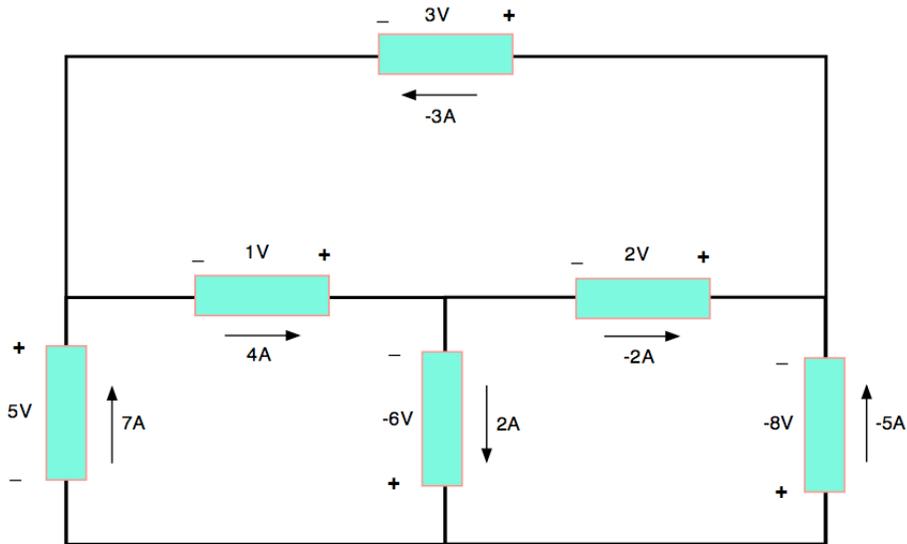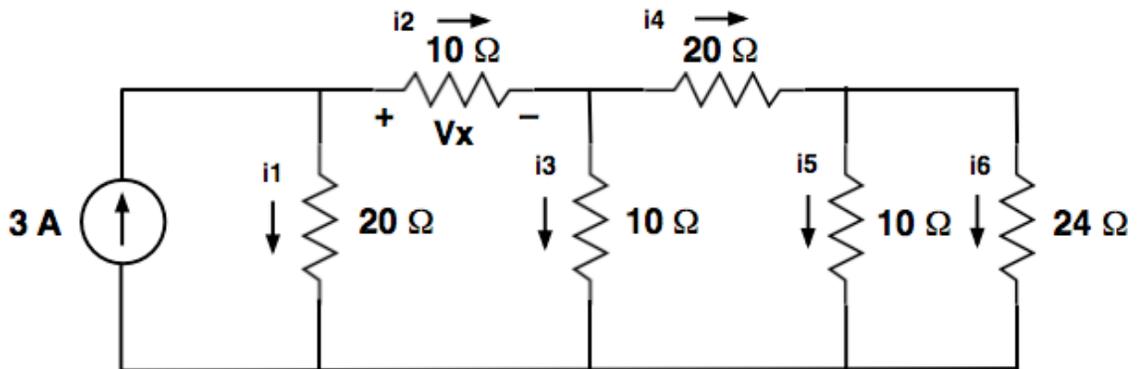

4- A voltage source $V = 8\cos(t)$ V is connected across a resistor of 9Ω. Find the time average power delivered to the resistor (hint: You will need to average over one full cycle, i.e. from $t = 0$ to $t = 2\pi$).
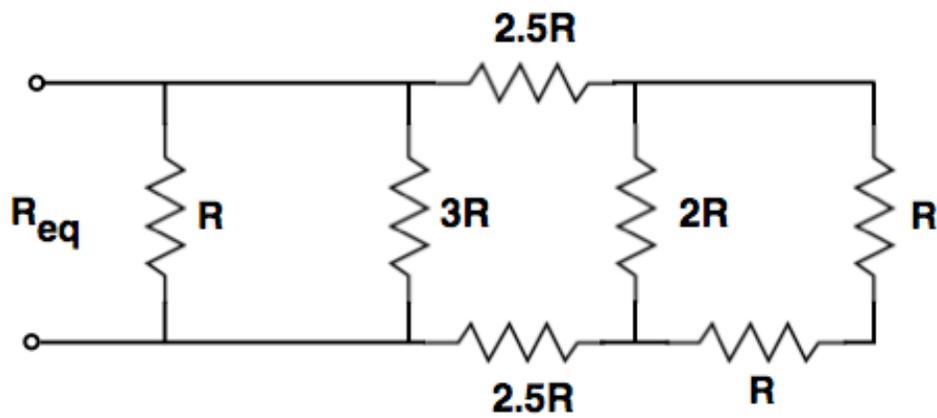
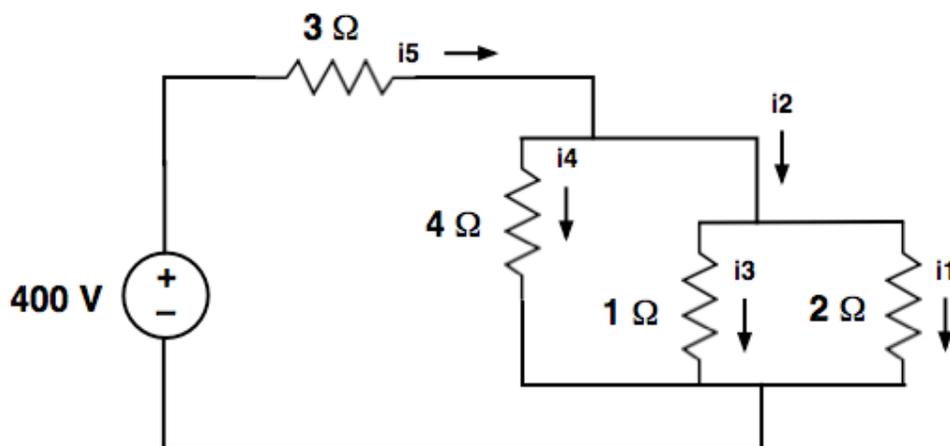5- Determine Vx and the power absorbed in the 12 Ω resistor
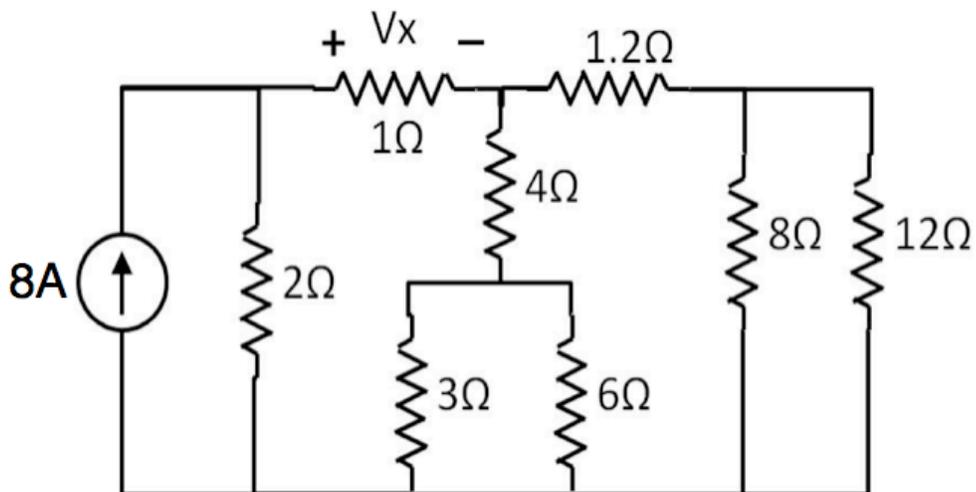
6- In the circuit shown in the figure determine V_x and the power absorbed in the 24Ω resistor

7- Find the equivalent resistance

8- Find the currents in the following figure.

9- Below is shown a simple resistive current source. The resistive load is represented by a 10 kΩ potentiometer. What is the current through the resistive load over the full range of the potentiometer and what is the reading on the voltmeter over the full range of the potentiometer? Does this circuit represent a reasonable constant current source? Why or why not (explain)?

1 MΩ

A

ammeter

1 kV

Voltage source

R_{load}

10 kΩ

V

Voltmeter