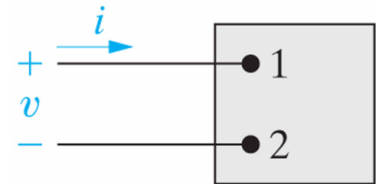


## EE 202-HW 1, Due Monday September 17, 2012

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### Problem 1:

The voltage and current at the terminals of the circuit element shown in the figure are as follows:



$$v(t) = \begin{cases} 10t - 2t^2 \text{ V} & 0 < t < 5 \text{ s} \\ 0 & \text{otherwise} \end{cases}$$

$$i(t) = \begin{cases} 50 - 20t \text{ mA} & 0 < t < 5 \text{ s} \\ 0 & \text{otherwise} \end{cases}$$

- At what instant of time is the power being delivered to the circuit element maximum?
- What is the power at the time found in part (a)?
- At what instant of time is the power being extracted from the circuit element maximum?
- What is the power at the time found in part (c)?

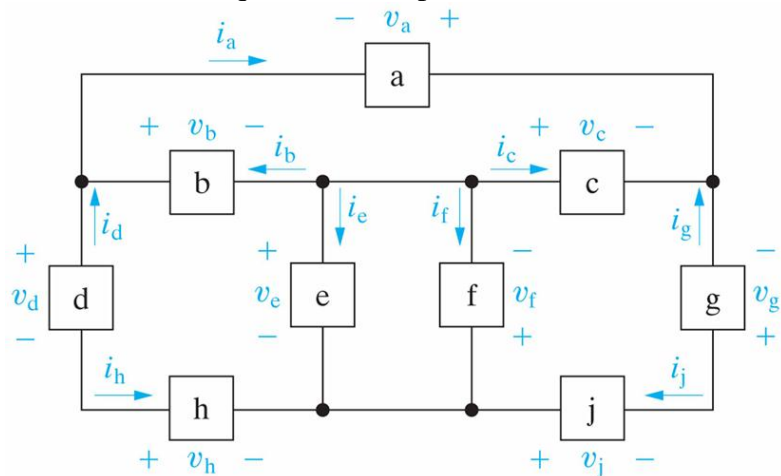
### Problem 2:

For the following circuit we are given the voltages and currents:

$$v_d = -7 \text{ V}, v_f = 18 \text{ V}, v_g = 20 \text{ V}, v_h = -15 \text{ V}, v_j = 10 \text{ V},$$

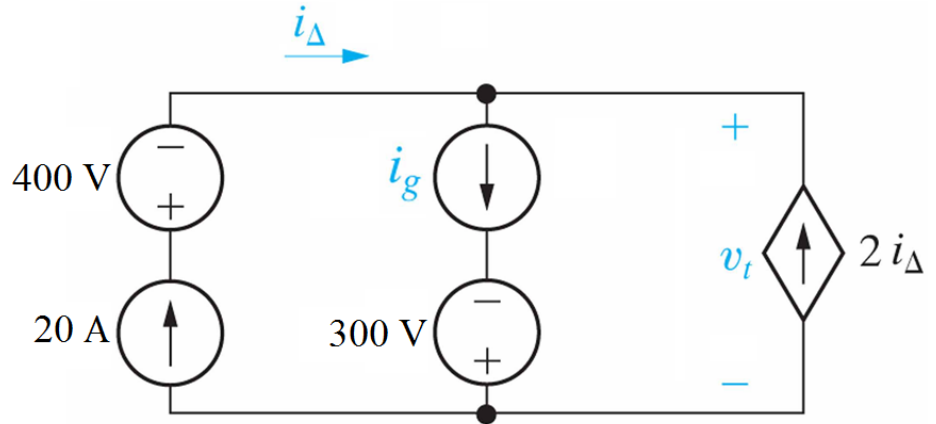
$$i_a = 5 \text{ A}, i_b = -6 \text{ A}, i_c = -15 \text{ A}, i_e = 7 \text{ A}, i_f = 14 \text{ A}, \text{ and } i_g = 10 \text{ A}.$$

- Use KVL and KCL to find the unknown voltages and currents in the circuit.
- Calculate the power to every element of the circuit and put these powers in a table, show if the power is absorbed or generated.
- Show that the total power generated in the circuit equals the total power absorbed.



**Problem 3:**

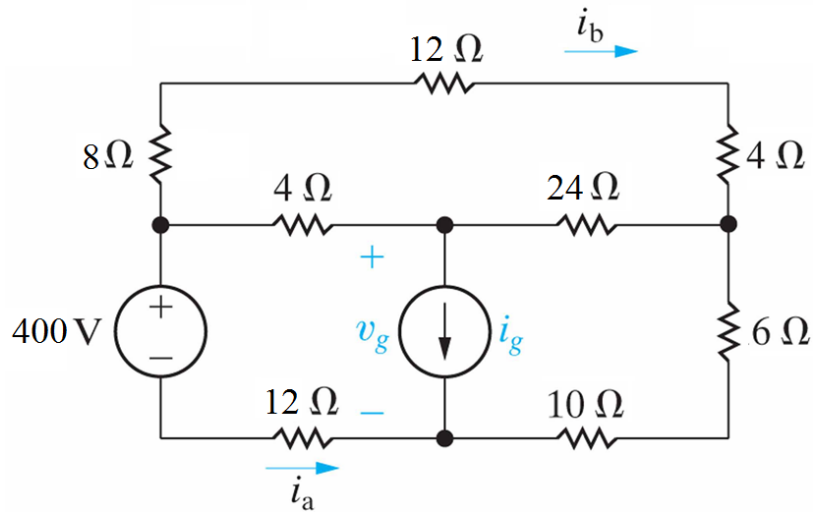
Find the total power developed in the circuit if  $v_t = 500$  V and  $i_g = 60$  A.



**Problem 4:**

The currents  $i_a$  and  $i_b$  in the circuit below are 20 A and 10 A, respectively.

- Find the current  $i_g$ .
- Find the power dissipated in each resistor.
- Find the voltage  $v_g$ .
- Show that the total power generated in the circuit equals the total power absorbed.



**Problem 5:**

For the following circuit:

- Find the voltage  $v_y$ .
- Show that the total power generated in the circuit equals the total power absorbed.

