Assignment problems: Chapter 1 and 2

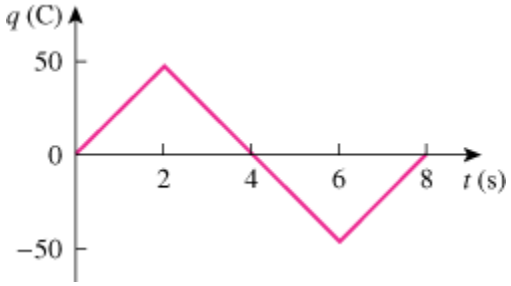
Chapter 1:

1.3 (b & c): Find the charge $q(t)$ flowing through a device if the current is:

(b) $i(t) = (2t + 5)\text{mA}, q(0) = 0$

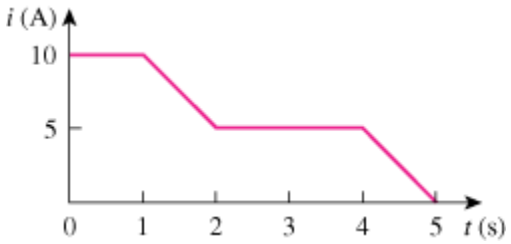
(c) $i(t) = 20\cos(10t + \pi/6)\mu\text{A}, q(0) = 2\ \mu\text{C}$

1.7: The charge flowing in a wire is plotted in Fig below. Sketch the corresponding current.



1.9: The current through an element is shown in the Figure below. Determine the total charge that passed through the element at:

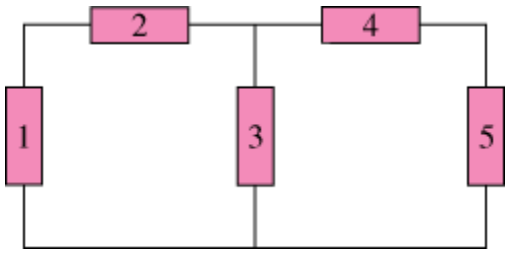
(a) $t = 1$ s (b) $t = 3$ s (c) $t = 5$ s



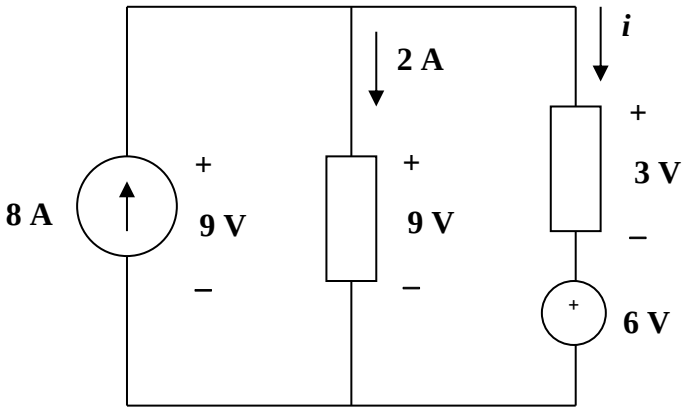
1.17: Figure below shows a circuit with five elements. If

$p_1 = -205$ W, $p_2 = 60$ W, $p_4 = 45$ W, and $p_5 = 30$ W,

calculate the power p_3 absorbed by element 3.



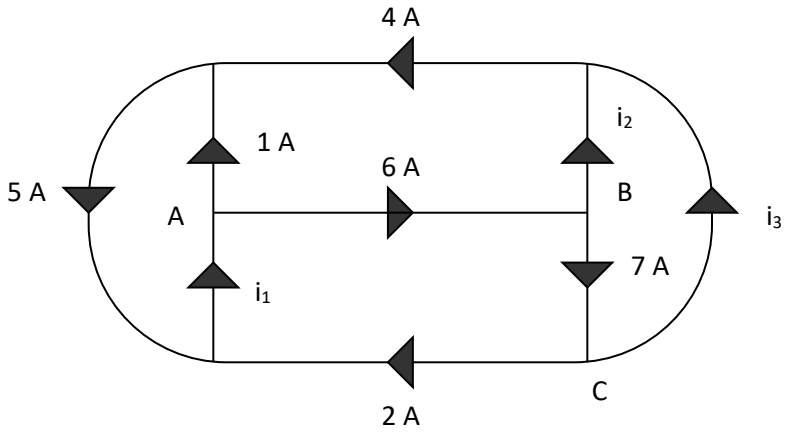
1.19: Find ***i*** in the network of Figure below:



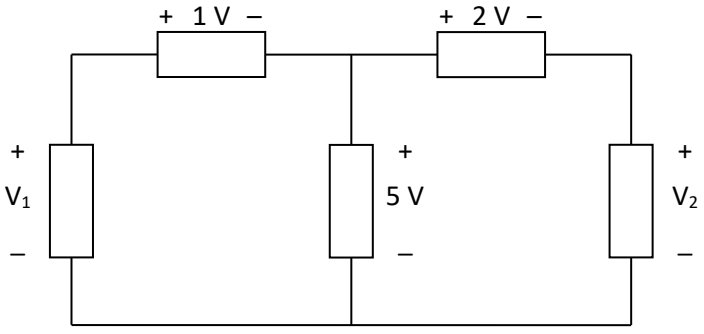
1.23: A 1.8-kW electric heater takes 15 min to boil a quantity of water. If this is done once a day and power costs 10 cents per kWh, what is the cost of its operation for 30 days?

Chapter 2:

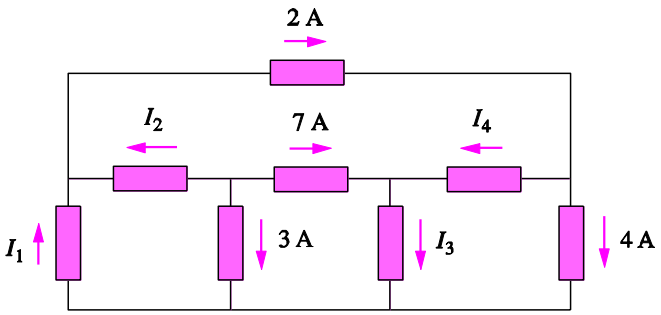
2.9: Find i_1, i_2, and i_3 in the following figure



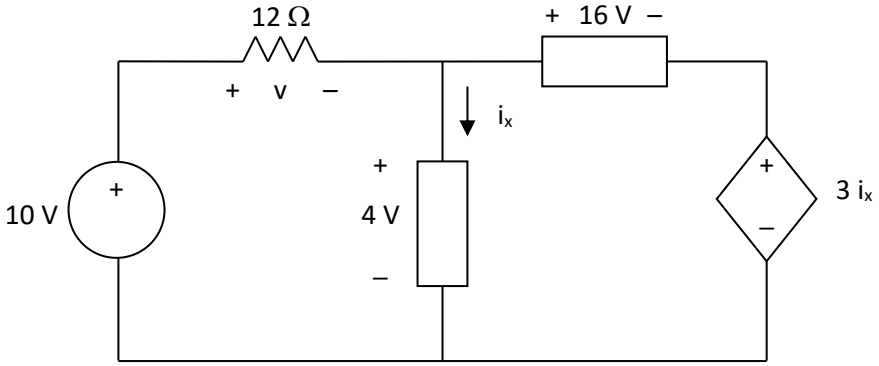
2.11: In the following circuit, calculate V_1 and V_2.



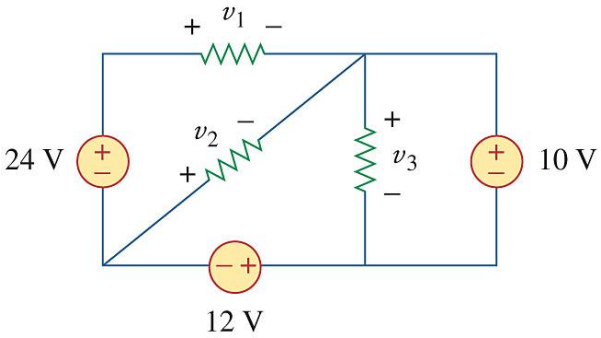
2.13: For the circuit in the following Figure, use KCL to find the branch currents I_1 to I_4.



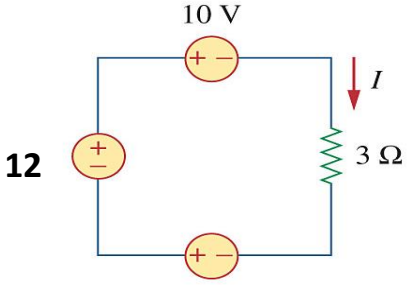
2.15: Calculate v and i_x in the following circuit.



2.17: Obtain v_1 through v_3 in the following circuit.



2.19: For the following circuit, find *I*, the power dissipated by the resistor, and the power supplied by each source.



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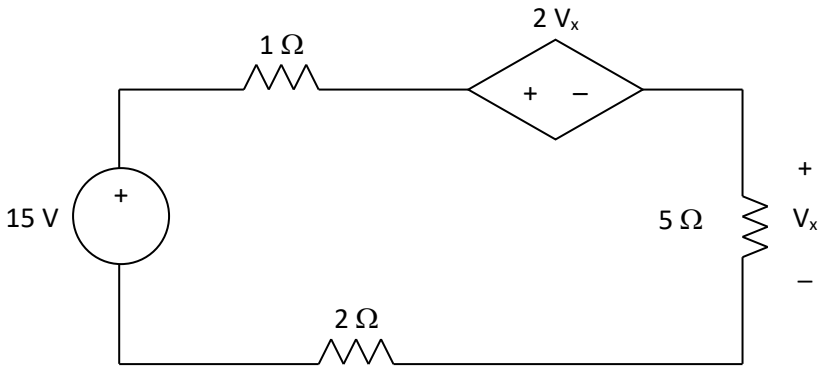
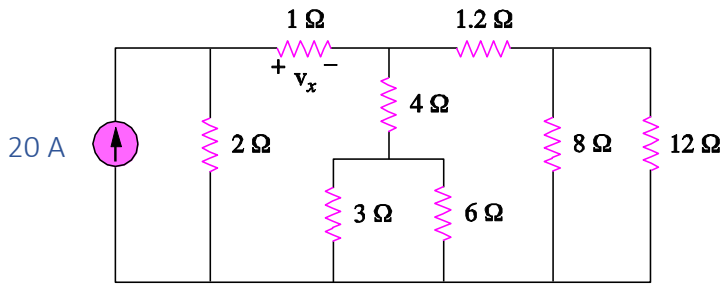
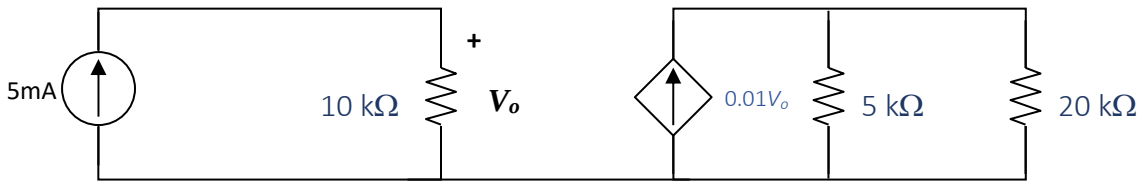
2.21: Find V_x in the following circuit.



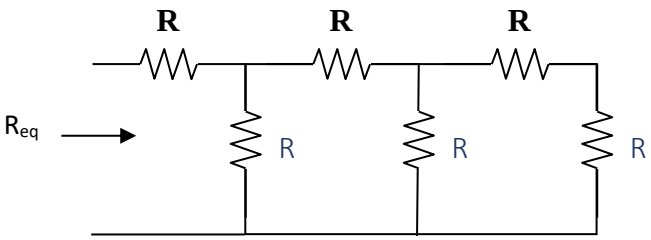
2.23: In the circuit shown below, determine v_x and the power absorbed by the 12-Ω resistor.



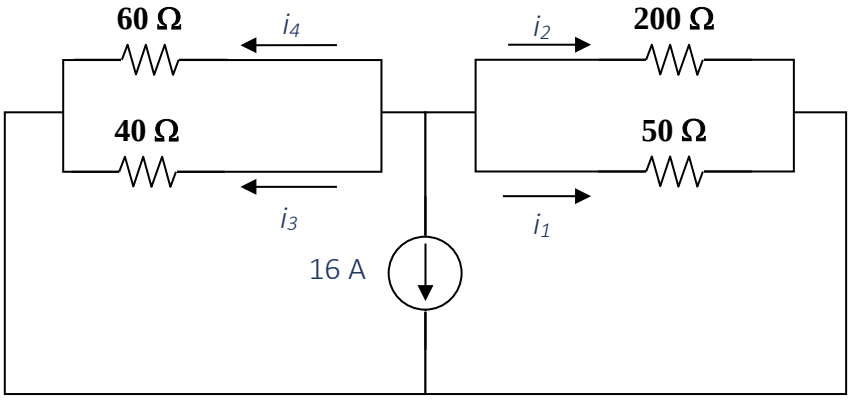
2.25: For the network shown below, find the current, voltage, and power associated with the 20-kΩ resistor.



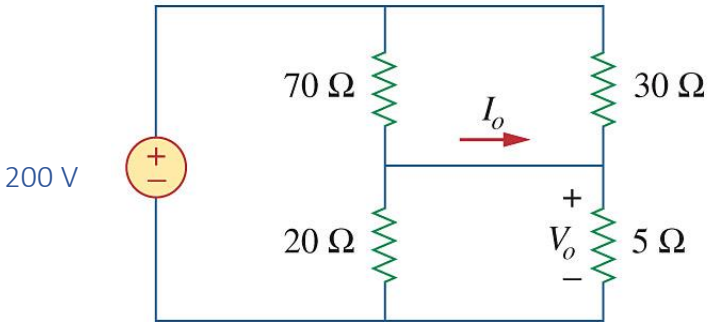
2.29: All resistors in the following circuit are 5 Ω each. Find R_{eq}.



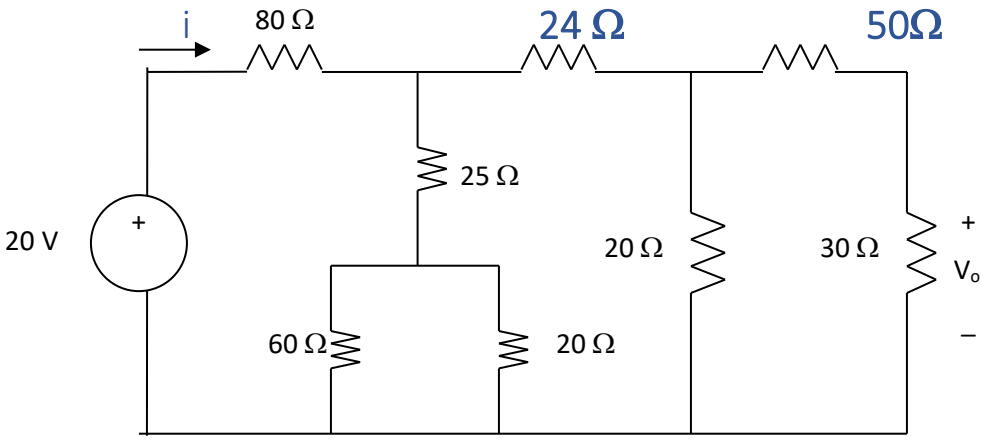
2.32: Find i_1 through i_4 in the following circuit.



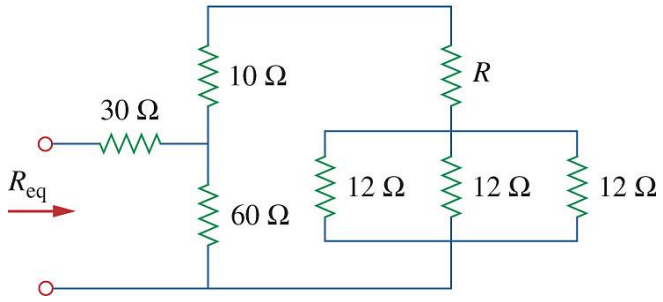
2.35: Calculate V_o and I_o in the following circuit.



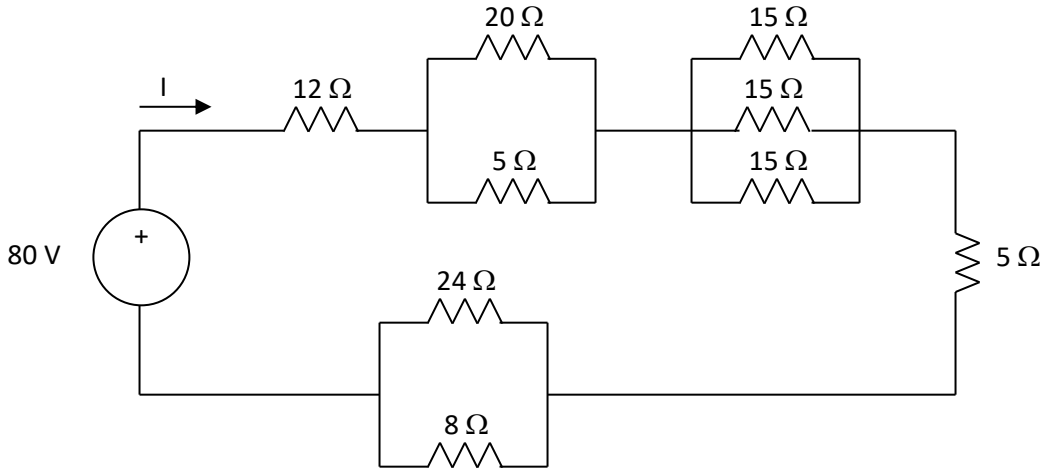
2.36: Find i and V_o in the following circuit.



2.41: If R_{eq} = 50 Ω in the following circuit, find R.



2.46: Find I in the following circuit.



2.47: Find the equivalent resistance R_{ab} in the following circuit.