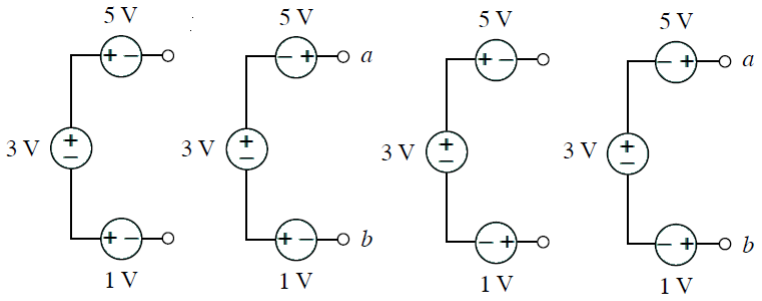
Review Problems

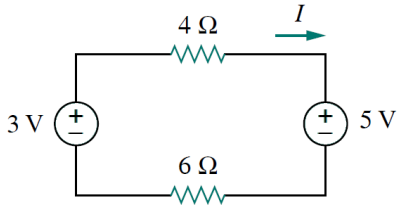
(Electric Engineering)

Chapter 2

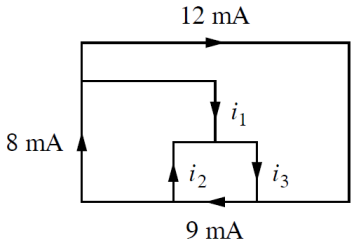
1) The voltage across a 5-kΩ resistor is 16 V. Find the current through the resistor.
2) When the voltage across a resistor is 120 V, the current through it is 2.5 mA. Calculate its resistance
3) Which of the circuits in the figure below will give you $V_{ab} = 7\,\text{V}$?



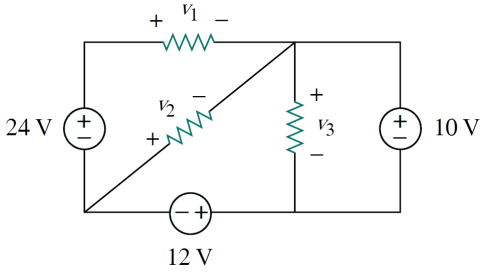
4) The current I in the circuit below is: (a) −0.8 A (b) −0.2 A (c) 0.2 A (d) 0.8 A



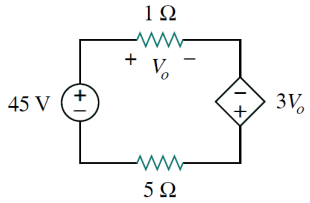
5) Use KCL to obtain currents i_1, i_2, and i_3 in the circuit shown below.



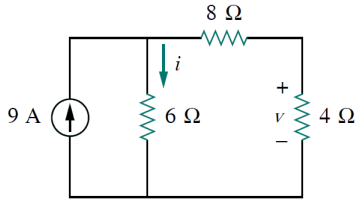
6) Obtain v_1 through v_3 in the circuit below.



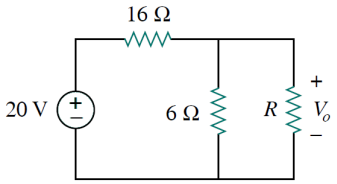
7) Calculate the power dissipated in the 5-Ω resistor in the circuit below.



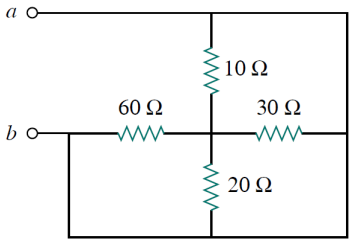
8) Find i, v, and the power dissipated in the 6-Ω resistor in figure below.



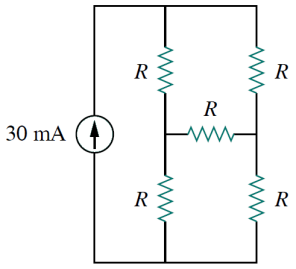
9) In the circuit of the figure below, find R if $V_0 = 4\,\text{V}$.



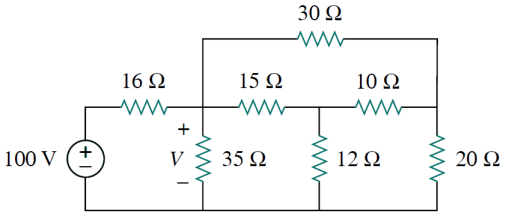
10) Obtain the equivalent resistance at the terminals a-b for the circuit shown below.



11) What value of R in the circuit below would cause the current source to deliver 800 mW to the resistors?

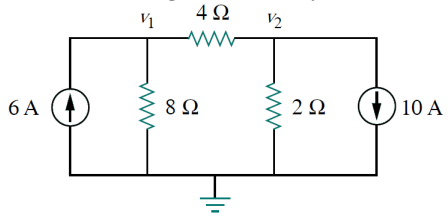


12) Determine V in the circuit below.

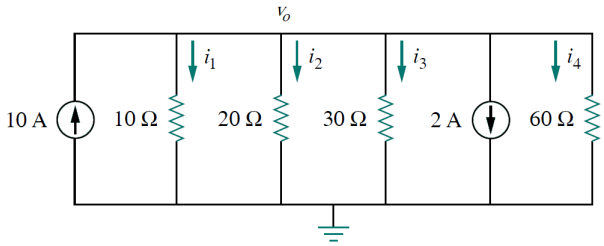


Chapter 3

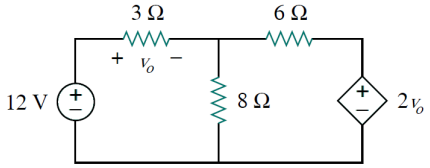
13) Determine v_1 and v_2 in the circuit below using nodal analysis.



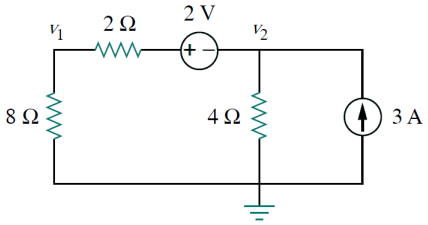
14) Find the currents i_1 through i_4 and the voltage v_0 in the circuit shown below using nodal analysis.



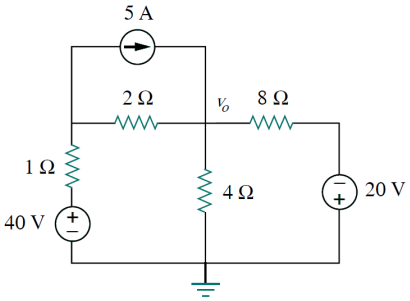
15) Calculate v_0 in the circuit shown below using nodal analysis.



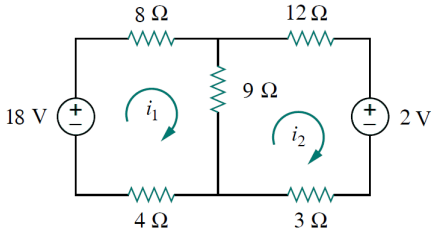
16) Calculate v_1 and v_2 in the circuit below using nodal analysis.



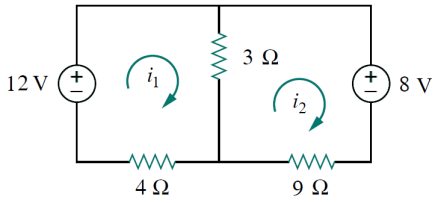
17) Apply mesh analysis to find v_0 in the circuit below.



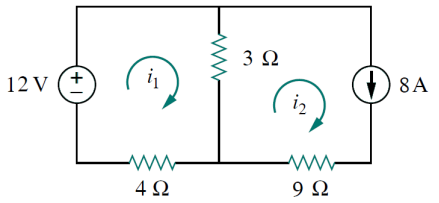
18) Calculate the mesh currents i_1 and i_2 in the circuit below.



19) Calculate the mesh currents i_1 and i_2 in the circuit below.

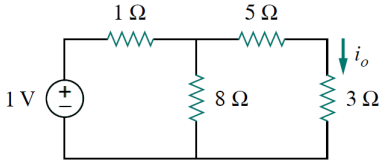


20) Calculate the mesh currents i_1 and i_2 in the circuit below.

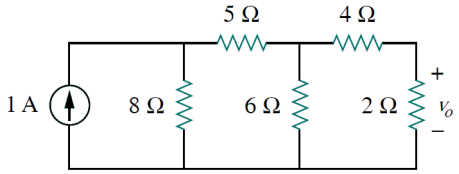


Chapter 4

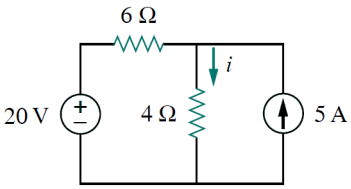
21) Calculate the current i_0 in the circuit below. What does this current become when the input voltage is raised to 10 V?



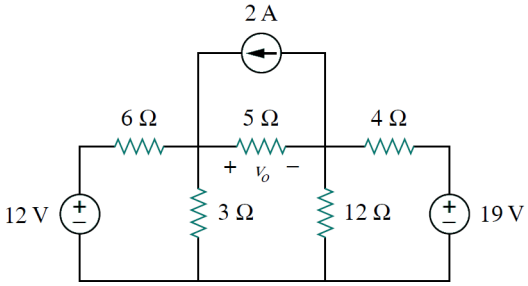
22) Find v_0 in the circuit shown below. If the source current is reduced to 1 μA, what is v_0?



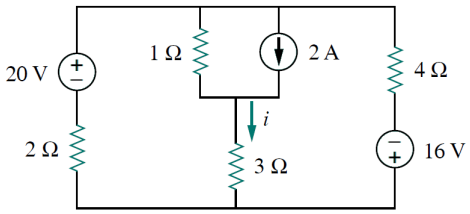
23) Apply superposition to find i in the circuit below.



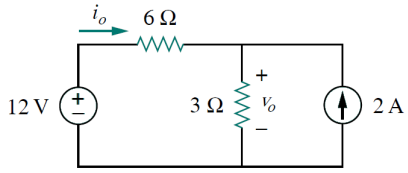
24) Determine v_0 in the circuit below using the superposition principle.



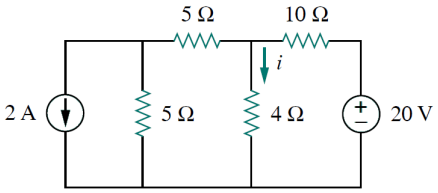
25) For the circuit shown below, use superposition to find i. Calculate the power delivered to the 3-Ω resistor.



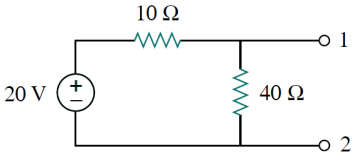
26) Apply source transformation to determine v_0 and i_0 in the circuit below.



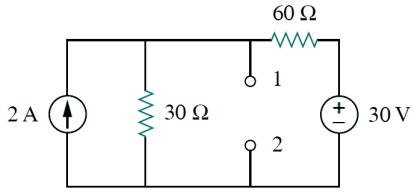
27) For the circuit below, use source transformation to find i.



28) Determine R_{Th} and V_{Th} at terminals 1-2 of each of the circuits below.

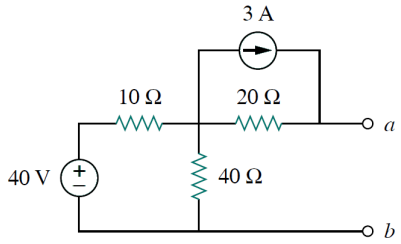


(a)

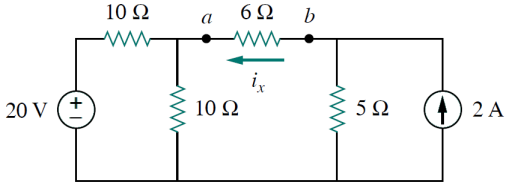


(b)

29) Find the Thevenin equivalent at terminals a-b of the circuit below.



30) Find the Thevenin equivalent looking into terminals a-b of the circuit below and solve for i_x.



with my best wishes
Dr. Waleed Al-Hanafy