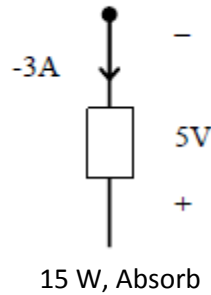
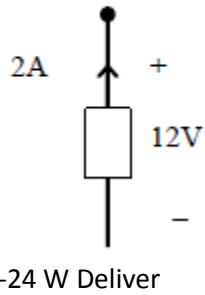
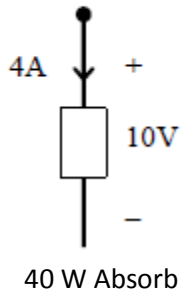


Closed Book, double sided sheet of notes allowed

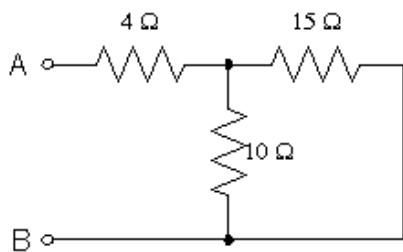
1 Find the power absorbed by each element



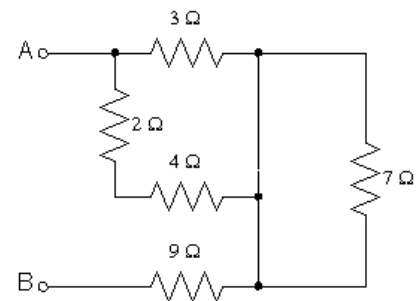
2 From the circuit below, find the current I

	<p>KVL: $-20 + 10 + 3I - (-4) = 0$</p> <p>$3I = 6, I = 2A$</p>
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3) What is the resistance between terminals A and B ?

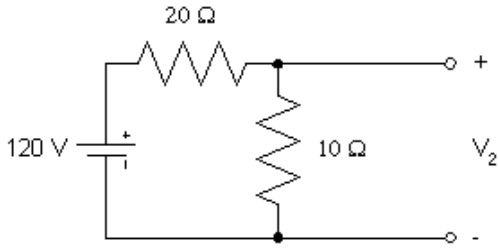


$R_{ab} = 4 + 15 \parallel 10 = 10 \text{ Ohms}$

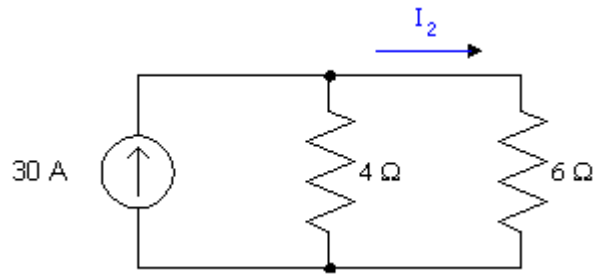


(7 Ohms is shorted out, remove)
 $R_{ab} = (3 \parallel 6) + 9 = 11 \text{ Ohms}$

4) Find V_2 and I_2

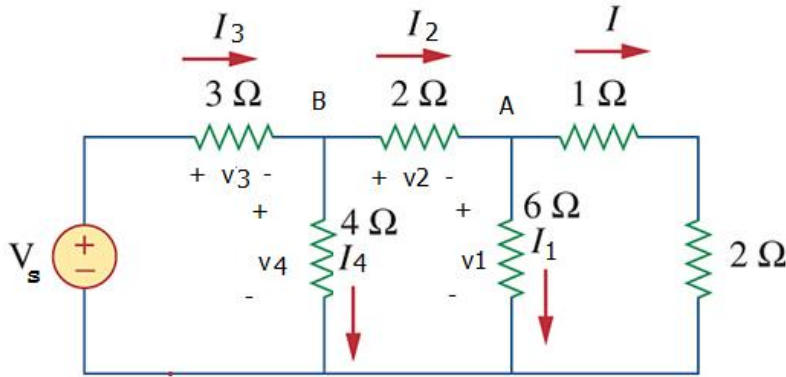


Voltage divider: $V_2 = 120 \cdot (10/30) = 40 \text{ V}$



Current Divider: $I_2 = 30 \cdot 4 / (10) = 12 \text{ A}$

5) IF the current I is 1A, what is V_s ?



KVL Right Loop

$$-v_1 + 1I + 2I = 0 \rightarrow v_1 = 3I = 3 \text{ V}$$

Ohm's Law, 6 Ohm resistor

$$I_1 = V_1 / 6 = 0.5 \text{ A}$$

KCL Node A

$$I_1 + I - I_2 = 0 \rightarrow I_2 = 1.5 \text{ A}$$

KVL Middle Loop

$$-V_4 + 2I_2 + V_1 = 0 \rightarrow V_4 = V_1 + 2I_2 = 6 \text{ V}$$

Ohm's Law, 4 Ohm resistor

$$I_4 = 6 / 4 = 1.5 \text{ A}$$

KCL at Node B

$$-I_2 - I_4 + I_3 = 0 \rightarrow I_3 = I_2 + I_4 = 3 \text{ A}$$

KVL Left Loop

$$-V_s + 3I_3 + V_4 = 0, V_s = 3I_3 + V_4$$

$$V_s = 9 + 6 = 15 \text{ Volts}$$