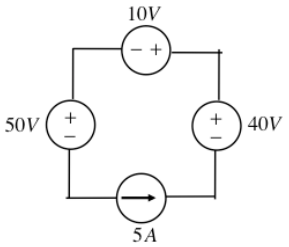
Homework (2)

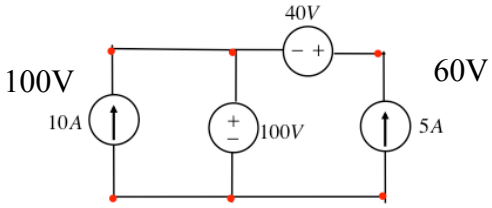
Problem (1)
If the interconnection shown is valid, find the total power developed in the circuit. If the interconnection is not valid, explain why.



P = VI = 50(5) + 10(5) - (40)(5) = 5(50+10-40) = 5(20) = 100 watts
The interconnection is valid because each node can hold the 5 amps, and this does not violate KVL or KCL.

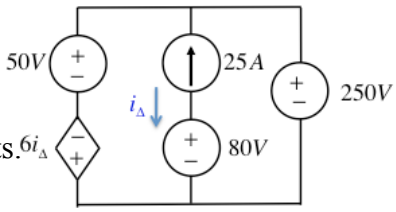
Problem (2)
If the interconnection shown is valid, find the power developed by the current sources. If the interconnection is not valid, explain why.

The interconnection shown is valid because there are voltage sources connected in two difference places in the circuit, therefore the currents will be different. None of Kirchoff's Laws are violated.
P = 10(100) + (100 + 40)(5) = 1700 Watts



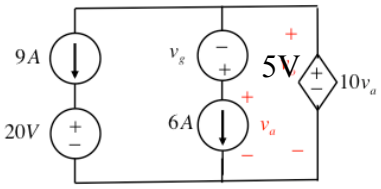
Problem (3)
If the interconnection shown is valid, find the total power developed in the circuit. If the interconnection is not valid, explain why.

The interconnection shown is valid because the voltage sources are able to carry the different currents.
i = -25 amps since it is in the opposite direction of the independent current source, and 6 * -25 = 125 so that's the dependent voltage source. 6i = 125 Volts.



Problem (4)
If, $v_o = 5V$, find the total power developed in the circuit shown.

Text



Problem (5)
a) Is the interconnection shown valid? Explain.
b) Can you find the total energy developed in the circuit? Explain

a) No, the interconnection shown is not valid because the voltage sources in parallel are not the same value. KVL.
b) No, you cannot find the total energy in the circuit because the circuit is invalid.