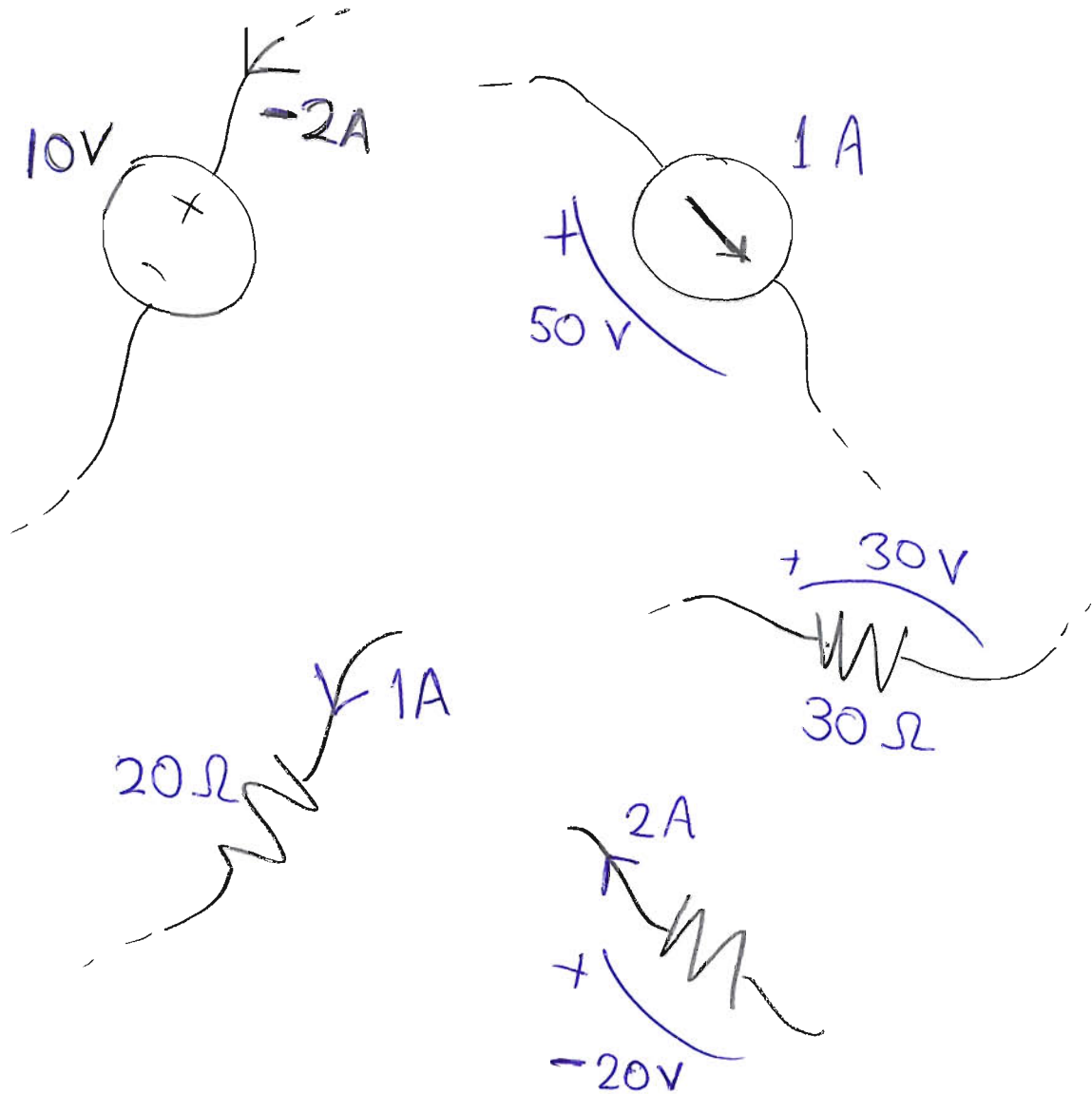
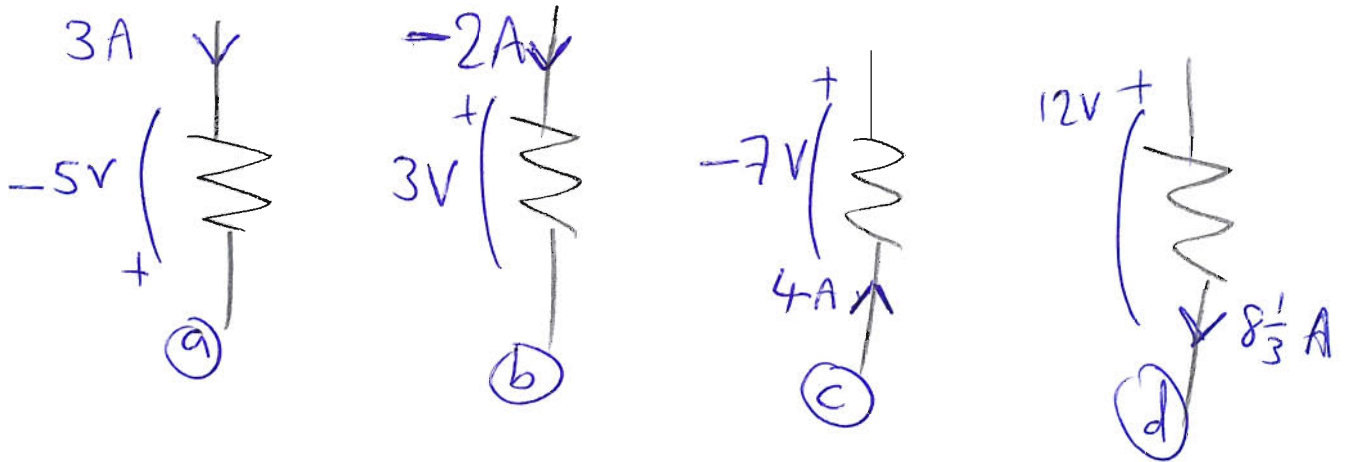


Definition directions, Power calculations.



- Which of these components **PRODUCES** the most power?
PRODUCE: to provide energy to the circuit ... increase potential of charge through it.
- Which **CONSUMES** the most power?
CONSUME: take energy from the circuit
- Find the power consumed by each of these five components.
= if ~~the~~ power is in fact being produced, this result will be negative
= (the earlier questions were intended to be answered before writing down the power of each component)

Directions, Power, Ohm's law.

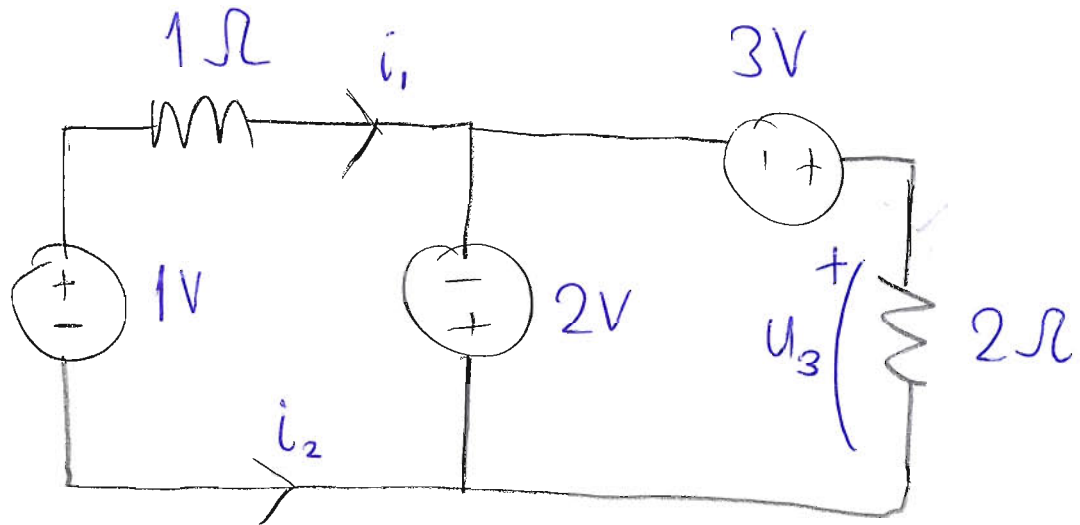


- At least one of the components shown above cannot be a normal resistor (e.g. a thin piece of metal or carbon, etc).

Which? and why?

- Find the resistance of each component (a, b, c, d). Be careful about the sign — it might be negative in some cases, when applying Ohm's law with correct attention to the definition directions of voltage and current. (A negative resistor is meaningful in active electronic circuits where a circuit can show a voltage that increases the energy given to passing charge in proportion to the current. The energy comes from a source in the circuit.)

KVL, KCL, Ohm's law.

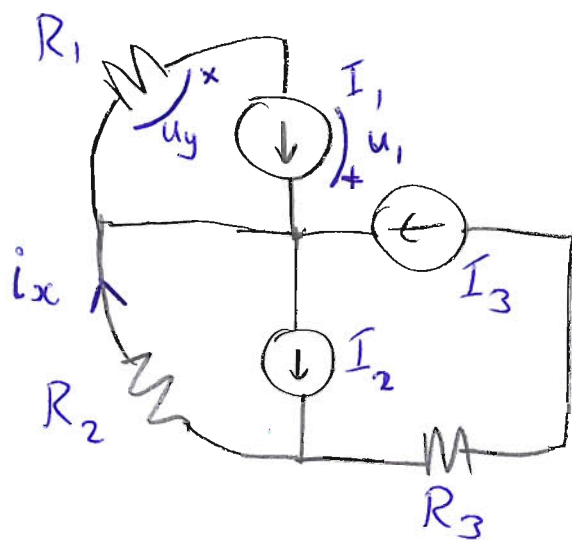


Find the following:

- i_1
- i_2
- u_3

- power supplied by the 2V source

KCL, KVL & Ohm's law. (symbolic)



Find (as symbolic expressions) the following:

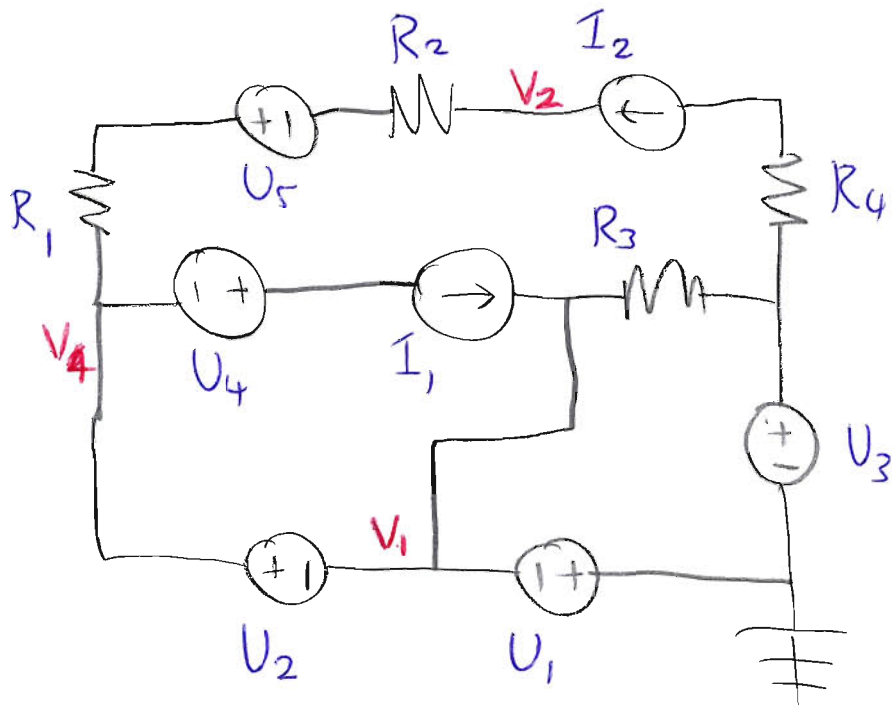
- i_x
- U_y
- power absorbed in R_3
(consumed)

KCL & Ohm's law

- U_1
- power supplied by source I_3
(produced)

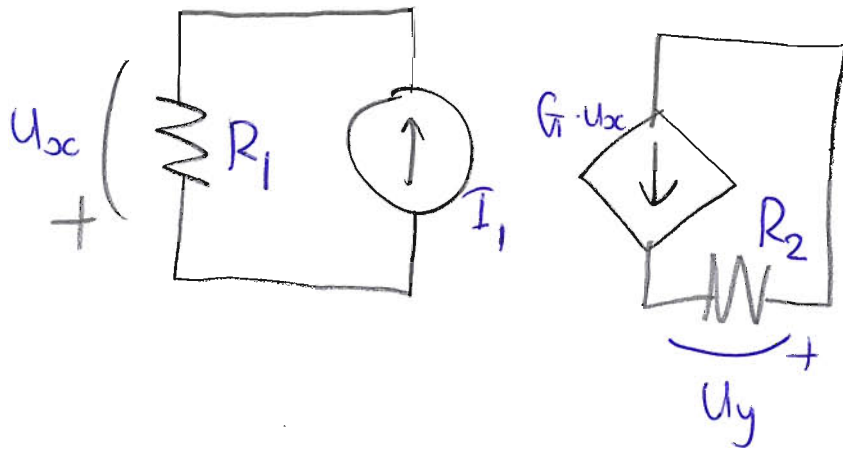
KVL (also)

Potentials, KVL, KCL, Ohm's law.



find V_1 , V_4 and V_2

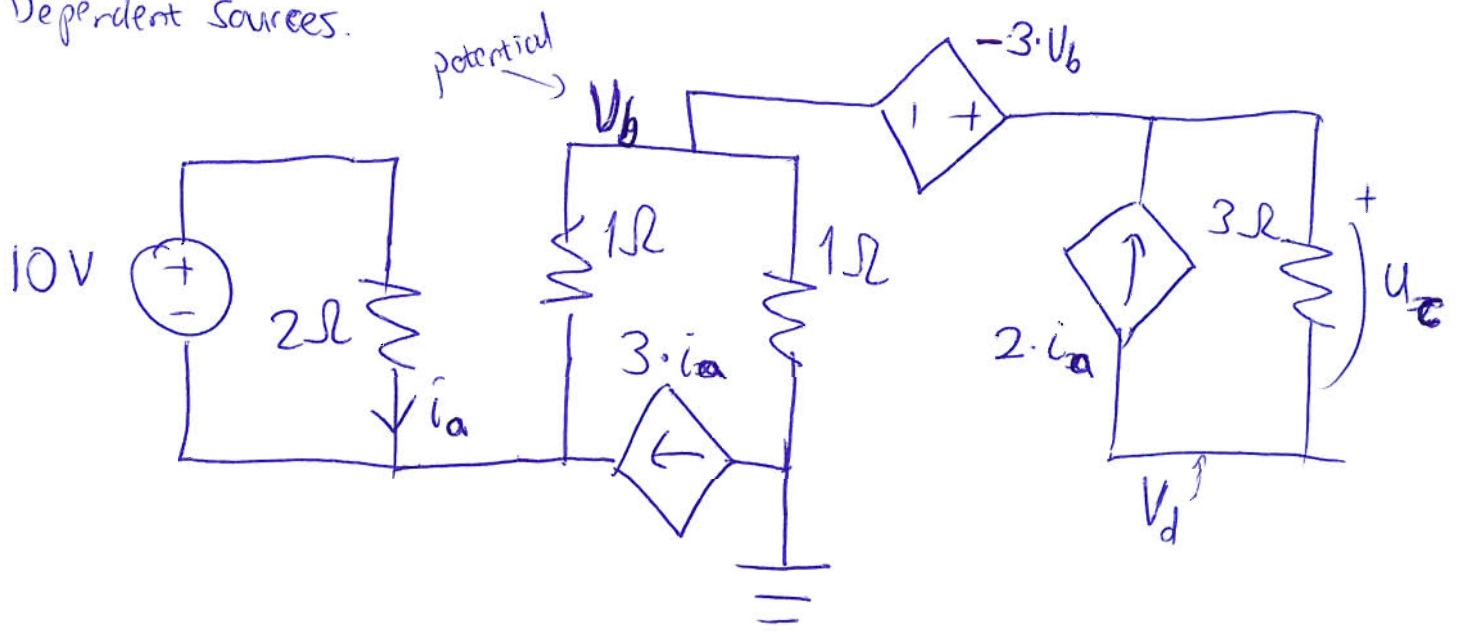
Dependent sources



find U_x then U_y .

(Notice: U_x is the controlling variable of the dependent source $G \cdot U_{xc}$. The dependent source's value is G .)

Dependent Sources.



find i_a , V_b , U_c , V_d

Notice the independence of the three loops.
(Only their potentials are coupled by the single-node connections between these loops. No current flows in these connections as there is no return path.)

A less independent circuit would be much harder.