1) **Label all source and component values:** A symbolic name of a source or resistor may be treated as a known numerical quantity in calculations. Avoid adding voltage labels to current sources or current labels to voltage sources. These labels are unnecessary.

2) **Label all resistors with a voltage drop measurement (+,−) and a current flow measurement (arrow):** By the passive sign convention, the current flow measurement arrow must point toward the minus sign of the voltage drop measurement. The passive sign convention ensures that sign errors are eliminated from Ohm’s law and power calculations. Note that we may add as many measurements of voltage or current to the circuit diagram as we like. Note also that measurement directions may differ from physical directions of voltage drops or current flows. Indeed, we are unable to determine physical directions of voltage drops or current flows until we solve the circuit!

3) **Look for components in series (since they have the same current):** Write equations setting currents equal for components in series. Alternatively, you may eliminate some redundant current measurements from the outset. For example, one might use $i_1$ for the current measurement of both an $R_1$ and an $R_2$ in series. Components in series with a current source all have the same current as the source and may be ignored when solving the circuit equations.

   Note that components in series having the same current is a consequence of Kirchhoff’s current law: since charge cannot accumulate anywhere in a circuit, the current flowing out of one component in series must flow into the next component in series, etc. One may draw a bubble around any part of a circuit and argue that the total current flowing out of the bubble must be zero. (The only caveat is that the bubble must not cut a capacitor in half.)

4) **Write an Ohm’s law equation for each resistor:** You may choose to use only a voltage or a current variable for each resistor later on—using $iR$ for a resistor voltage or $v/R$ for a resistor current—to eliminate half of the variables at the outset.

5) **Keep track of unknown values:** You need as many independent equations as unknowns. Be on the lookout for subsets of equations that may be solved. That is, sometimes part of a circuit may be solved by itself without adding further equations.

6) **Write KVL (voltage loop) equations:** Avoid writing voltage loop equations for loops that include a current source. Start with inner loops, using next larger loop if current source is encountered. (Avoid loop equations that are the sum of two or more other loop equations.)

7) **Write KCL (current sum) equations:** Avoid writing equations for nodes connected by only voltage sources to another node: there must be a current source or resistor in each branch from a node. Nodes connected by wires are really the same node. (Avoid equations that are the sum of two or more other sum equations.)

8) **Solve for the unknowns.**