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Applying Kirchoff's Laws

Method 1: Assign a variable for current in each branch.

$$I_1, I_2, I_3, \dots$$

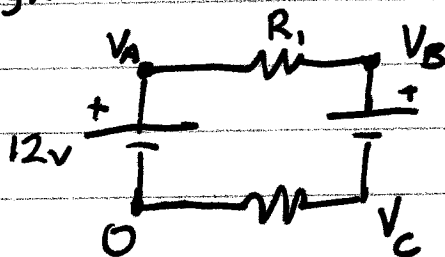
Current Law is easy: $I = I_2 + I_3$
(Or something like that.)

Voltage Law has $\pm V_{\text{batt}}$ and $\pm I_i R_A$ terms in it.

Solve for I 's as the unknowns (usually).

Method 2: Node Voltage Equations.

Assign a variable to the voltage @ each node.



Voltage Law automatically satisfied.

Current Law uses current thru resistors

$$I_A = (V_B - V_A) / R_1$$

Batteries link voltage variables

$$V_A - 0 = 12V$$

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Method 3: Mesh Currents

Beware: the current in any wire or resistor is not one of the variables that is being solved for.