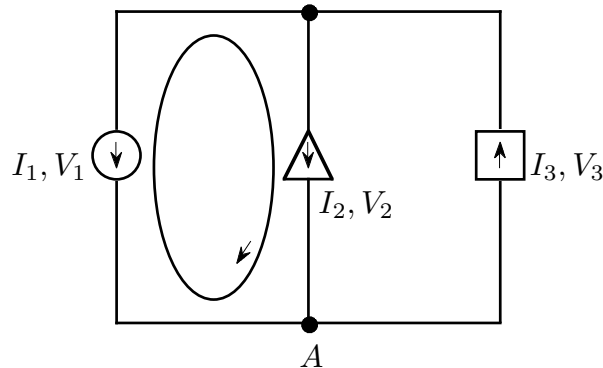


Circuit Theory Review



Kirchoff's First Law states that the current into a node must equal to the current out of a node. Currents are defined in the definitions of the arrow. Therefore, balancing the currents at node A , we have

current in = current out

$$I_1 + I_2 = I_3.$$

Kirchoff's Second Law states that the voltage around a loop must be zero. Again, voltages are defined in terms of the arrows. So going around the loop on the left in the direction shown in the arrow, we have

$$-V_1 + V_2 = 0.$$

Here are some common relationships between current and voltages:

$$\begin{aligned} \text{resistor :} & \quad V = IR \\ \text{inductor :} & \quad V = L\dot{I} \\ \text{capacitor :} & \quad I = C\dot{V} \end{aligned}$$

Note that if you balance the current, you'll get an equation in V , and if you balance the voltage, you'll get an equation in I .