Kirchoff's Laws

What Goes In, Must Come Out

Rule 1: Current Rule

For any junction in a circuit the total current flowing into the junction must equal the total current flowing out of the junction

For any point in a circuit:

$$\Sigma I = 0$$

$$\Sigma_{in} = \Sigma_{out}$$

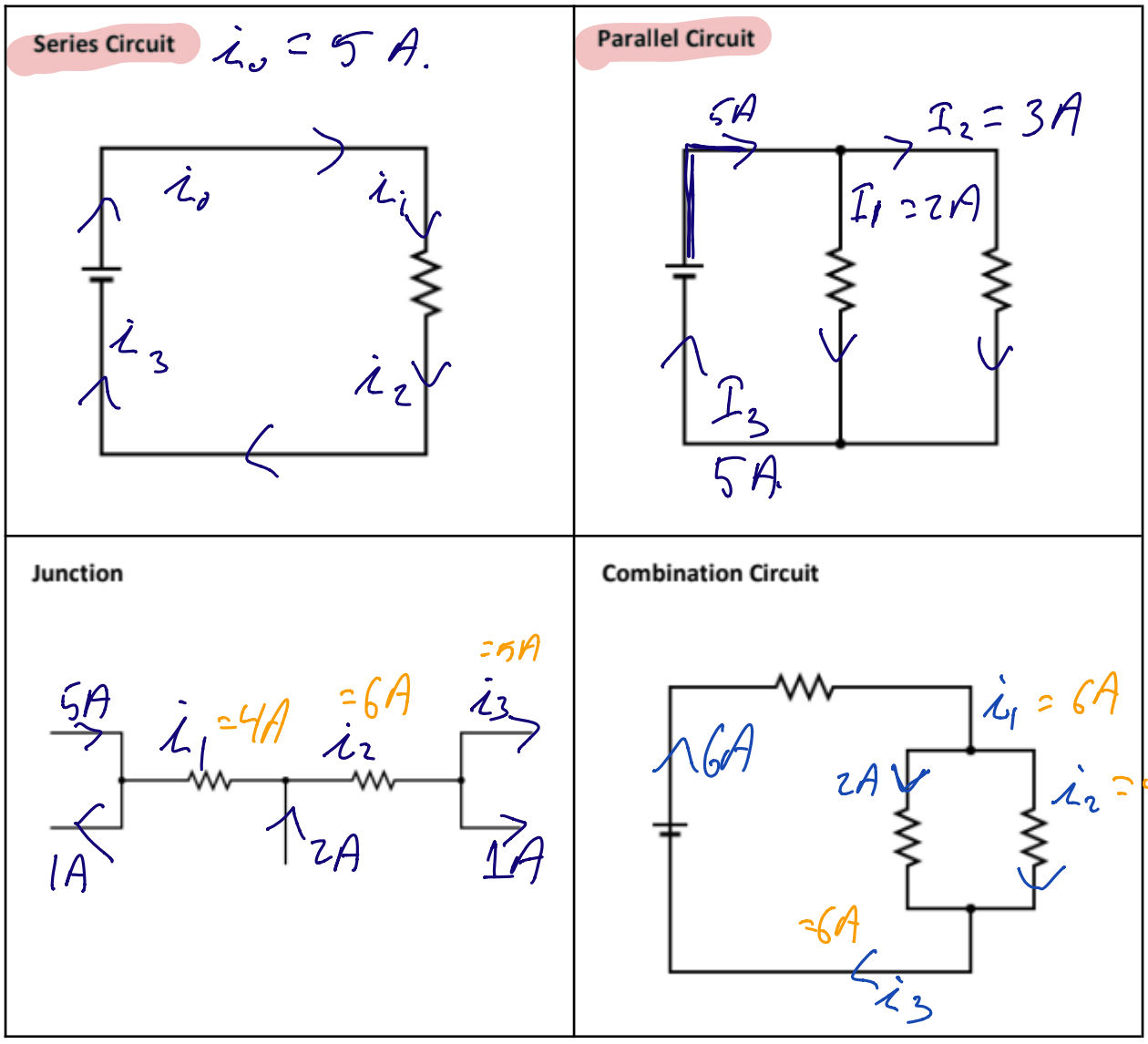
Power Source

Battery

resistor

$V = IR$

$P = IV$



Rule 2: Voltage Rule

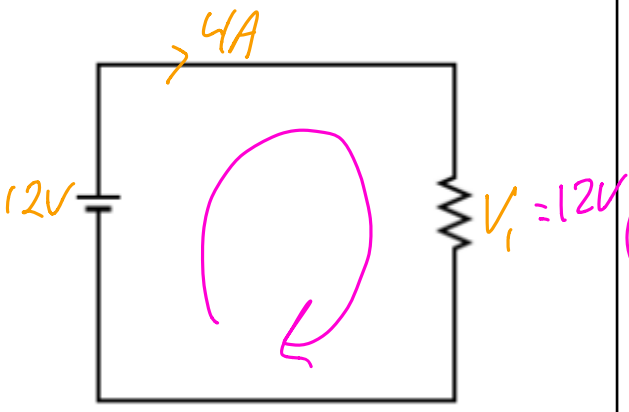
In any closed loop within a circuit the sum of all the voltages equals zero.

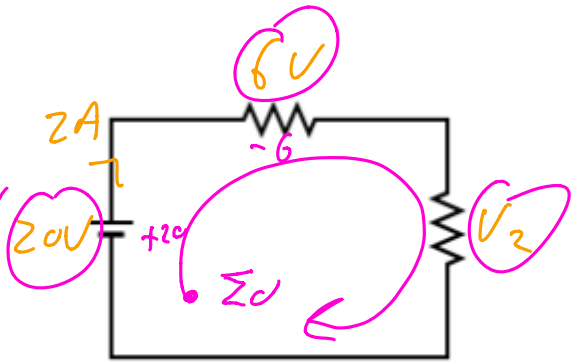
The total voltage gained equals the total voltage dropped

This is an example of conservation of energy

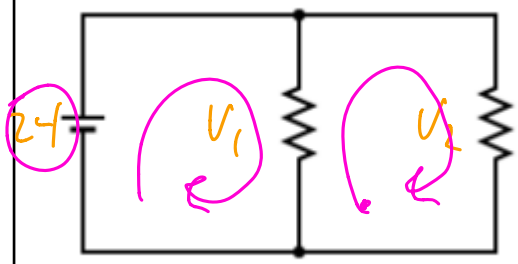
$$\Sigma V_{gained} = \Sigma V_{dropped}$$

Series Circuit

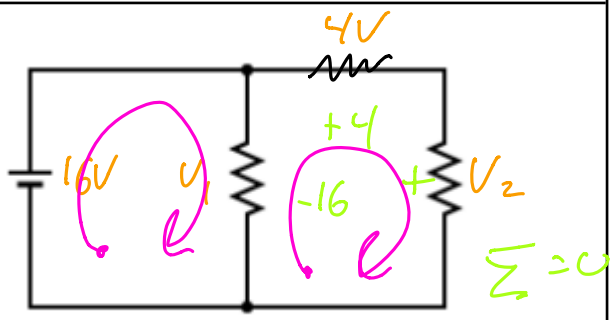




$V_2 = 14\ V$



$V_1 = 24V \quad V_2 = 24\ V$



$V_1 = 16V \quad V_2 = 12V$