

Loop law

Student Group

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Mesh set

In every closed circuit and every mesh of the network, the sum of all voltages is zero!
Set the voltage on the power supply to 12 V and measure this voltage precisely using a multimeter. Set up the measuring circuit shown in figure ##.

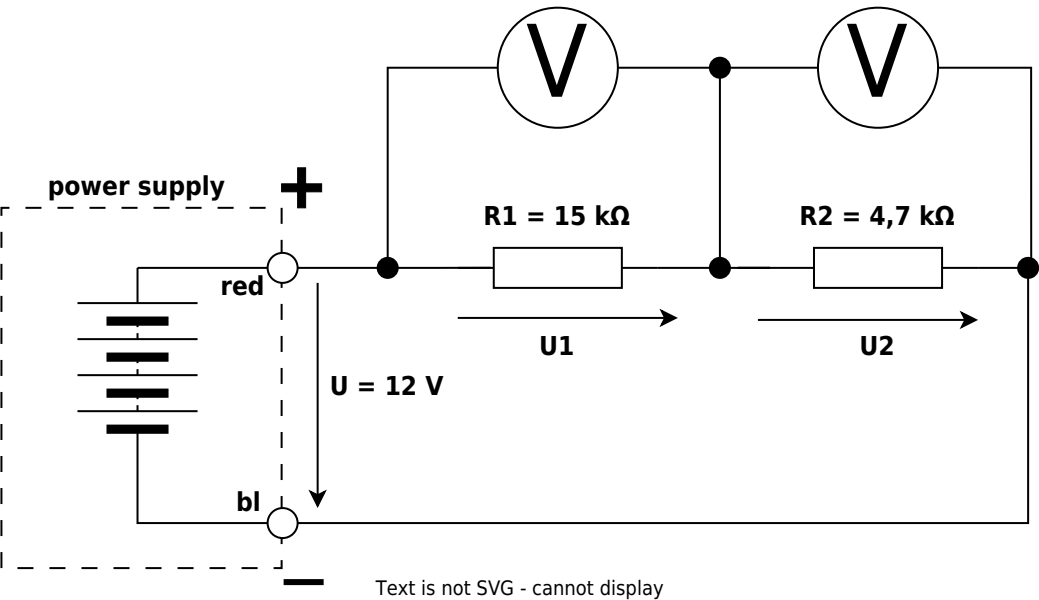


Fig. ##: Mesh-set

Add the voltage arrows and measure U , $U_{\rm 1}$ und $U_{\rm 2}$:

U	$U_{\rm 1}$	$U_{\rm 2}$

Tab. ##: Mesh set voltage measurement

What is the mesh set here?

Check the formula with the measured values:

The resistors R_1 and R_2 connected in series form a voltage divider. What is the ratio between the voltages U_1 and U_2 ?

$$\frac{U_1}{U_2} =$$

Set of nodes

At each junction point, the sum of all incoming and outgoing currents is equal to zero!

Set the voltage on the power supply to 12 V and measure the voltage accurately with a multimeter. In the first step, set up the measuring circuit shown in [figure ##](#):

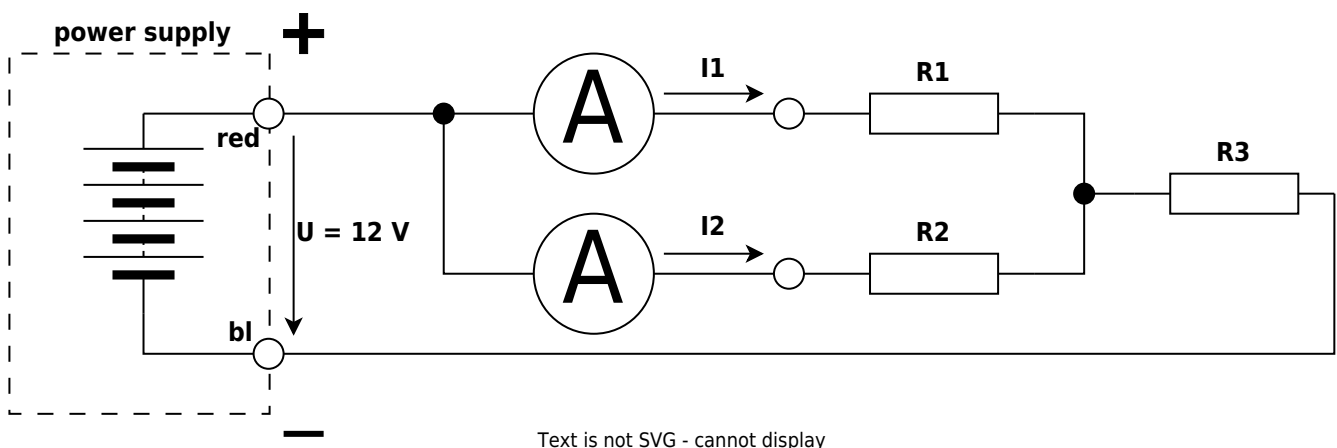


Fig. ##: Node-set circuit 1

Draw the arrows for the directions of currents I_1 and I_2 in [figure ##](#). The DC current measurement range must be set on both multimeter using the rotary switch. Then measure currents I_1 and I_2 and enter the measured values in [table ##](#).

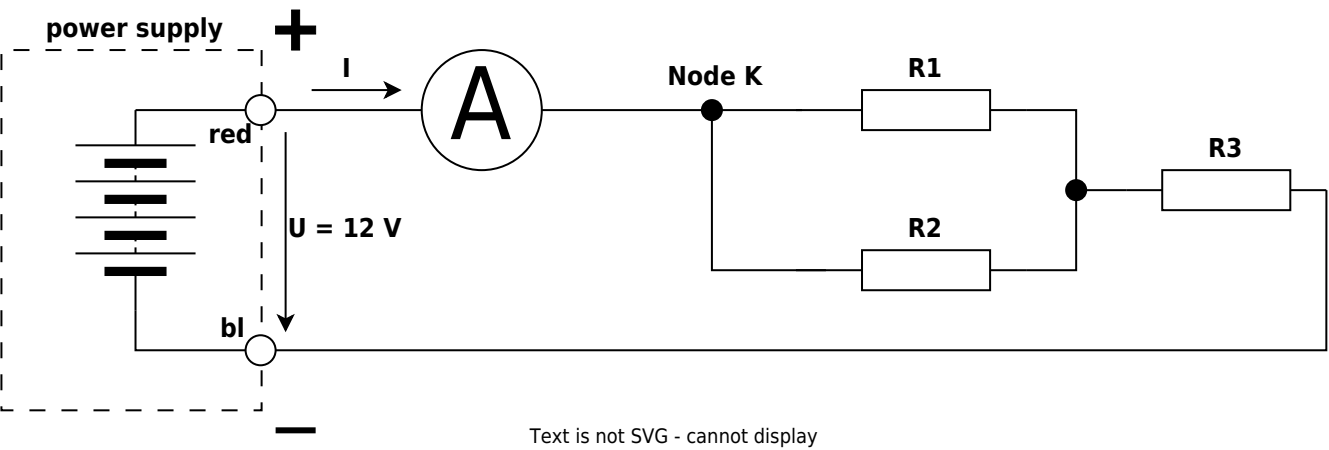


Fig. ##: Node-set circuit 2

What is the relationship between currents $I_{\rm 1}$ and $I_{\rm 2}$?

$$\frac{I_1}{I_2} =$$

Switch the power supply back on and measure the current I . Enter its value in [table ##](#).

I	$I_{\rm 1}$	$I_{\rm 2}$

Tab. ##: Node set current measurement

Determine the node set for node K and check its validity.

Using the measured values for resistors $R_{\rm 1}$, $R_{\rm 2}$, and $R_{\rm 3}$, calculate the total resistance $R_{\rm KP}$:

Using the calculated value $R_{\rm KP}$, check the measured value of the total current:

$$I = \frac{U}{R_{\rm KP}} =$$

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