

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 ##.

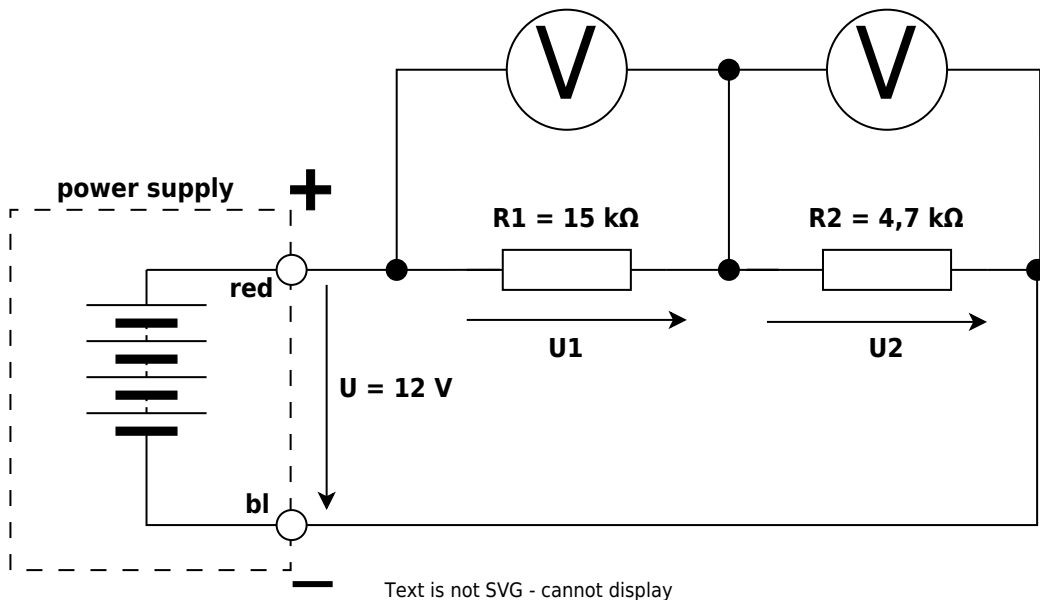


Fig. ##: Mesh-set

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

U	U_{1}	U_{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 ##](#):

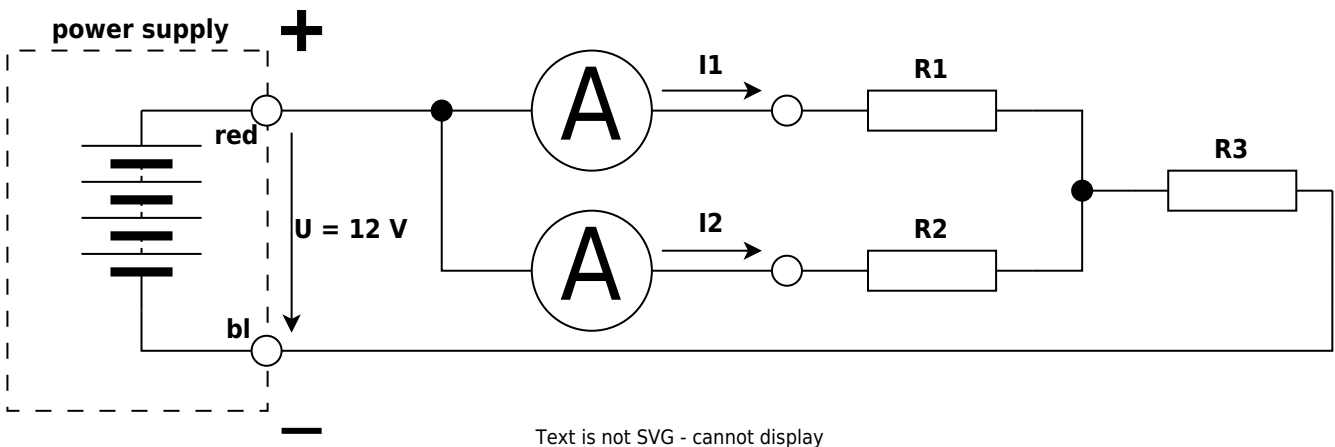
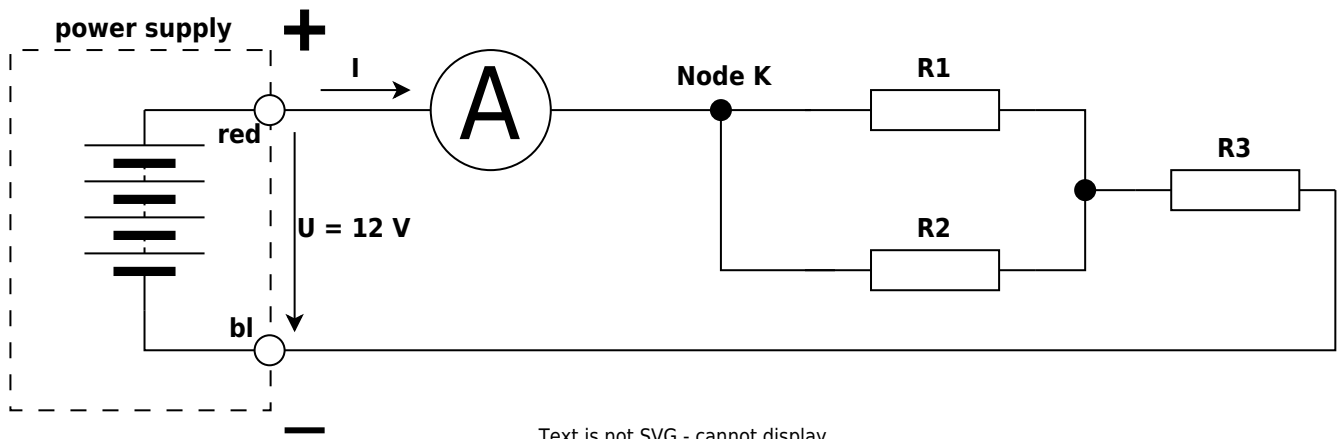


Fig. ##: Node-set circuit 1

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 ##](#).



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Fig. ##: Node-set circuit 2

What is the relationship between currents I_{R1} and I_{R2} ?

$$\frac{I_{R1}}{I_{R2}} =$$

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

I	I_{R1}	I_{R2}

Tab. ##: Node set current measurement

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

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

Using the calculated value R_{KP} , check the measured value of the total current:
 $I = \frac{U}{R_{\text{KP}}} =$

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