Mesh set

Student Group

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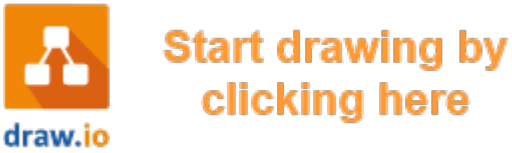
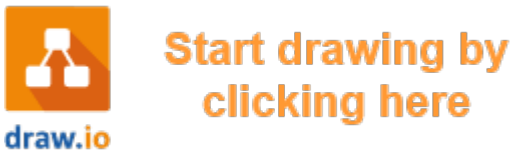
Mesh set

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 $12~\rm V$ and measure this voltage precisely using a



multimeter. Set up the measuring circuit shown in figure 1.
Fig. 1: Mesh-set Add the voltage arrows and measure U, $U_{\rm 1}$ und $U_{\rm 2}$:



Tab. 1: Mesh set voltage mesurement

What is the mesh set here?

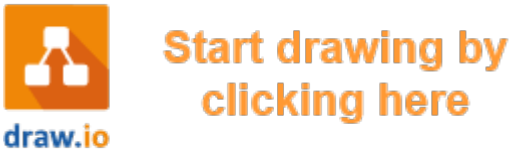
Check the formula with the measured values:

The resistors $R_{\rm 1}$ and $R_{\rm 2}$ connected in series form a voltage divider. What is the ratio between the voltages $U_{\rm 1}$ and $R_{\rm 2}$? $$ \frac{U_1}{U_2} = $$

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 $12~\rm V$ and measure the voltage accurately with a multimeter. In the first step, set up the measuring circuit shown in figure 2:

Fig. 2: Node-set circuit 1 Draw the arrows for the directions of currents $I_{\rm 1}$ and $I_{\rm 2}$ in figure 3. The DC current measurement range must be set on both multimeter using the rotary switch. Then measure currents $I_{\rm 1}$ and $I_{\rm 2}$ and



enter the measured values in table 2. Fig. 3: 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 2.

Tab. 2: Node set current mesurement

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