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 $12\ \mathrm{V}$ 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_1 und U_2:

Tab. 1: Mesh set voltage mesurement

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

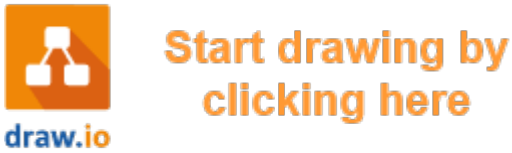

Fig. 2: Node-set circuit 1

Draw the arrows for the directions of currents I_1 and I_2 in figure 3. 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 2.

Fig. 3: Node-set circuit 2

What is the relationship between currents I_1 and I_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_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:

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