

## 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 1](#).



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Fig. 1: Mesh-set

Add the voltage arrows and measure  $U$ ,  $U_1$  und  $U_2$ :



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Tab. 1: 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  $R_2$ ?

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

## 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 V and measure the voltage accurately with a multimeter. In the first step, set up the measuring circuit shown in [figure 2](#):



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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.



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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.



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Tab. 2: 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:

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

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