Voltage divider as voltage source

The voltage divider shown in figure 1 is in an unloaded state, as the entire current supplied by the power supply flows through the resistors R_1 and R_2 connected in series. A resistor parallel to R_2 loads the voltage divider. Set the voltage on the power supply to 12 V and measure the exact voltage with a multimeter. Set up the measuring circuit shown in figure 1. For the connected load $R_\text{L} = 10 \text{ k}\Omega$, the voltage divider represents a voltage source. Like any voltage source, it has a source voltage (also called the original voltage) U_0 and an internal resistance R_i. The internal resistance of a voltage divider considered as a voltage source results from the parallel connection of the divider resistors R_1 and R_2:

$$R_i = R_1 || R_2 = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

Use the measured values of resistors R_1 and R_2 to calculate the internal resistance R_i of the voltage source:

$$R_i =$$

$$U_0 =$$

The power P_0 supplied by the power supply can be calculated using the following equation:

$$P_0 = U \cdot I_1$$

The power consumed by the load resistance can be determined using the following formula:

$$P_L = R_L \cdot {I_2}^2$$

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Fig. 1: Voltage divider

Draw the equivalent voltage source of the voltage divider:

What would be the value of U_2 without R_L?

$$U_{2,zero} =$$

Calculate $U_{2,\text{L}}$ and I_2 for $R_\text{L} = 10 \text{ k}\Omega$ using the values of the equivalent voltage source: (Provide formulas!)

U_{2L} :

I_2 :

Check the values by measuring:

$U_{2L,Meas}$:

$I_{2,Meas}$:

Check the values using Kirchhoff's rules: (Provide formulas!)

U_{2L} :

I_2 :