

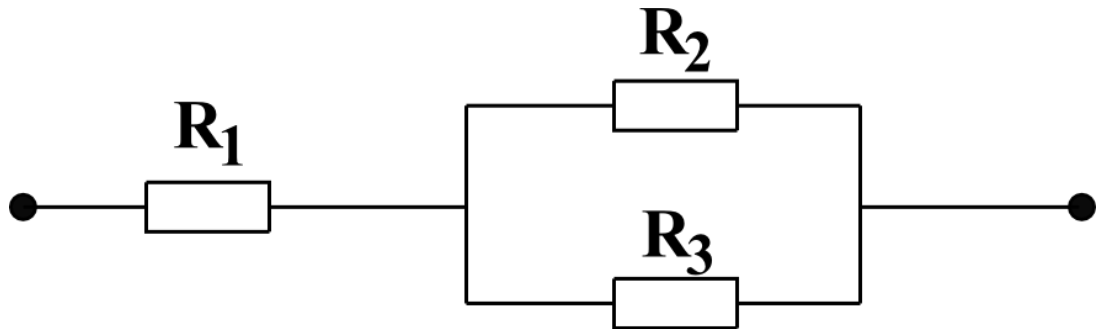
## Answer on Question 60642, Physics, Other

### Question:

Circuit consists of a  $1\ \Omega$  resistor in series with a parallel arrangement of  $6\ \Omega$  and  $3\ \Omega$  resistors. Calculate the total resistance of the circuit.

### Solution:

Here's the sketch of our task:



We have a  $R_1 = 1\ \Omega$  resistor in series with a parallel arrangement of  $R_2 = 6\ \Omega$  and  $R_3 = 3\ \Omega$  resistors. Our task is to find the total resistance of the circuit.

Let's first find the total resistance of the combination of resistors  $R_2 = 6\ \Omega$  and  $R_3 = 3\ \Omega$  that connected in parallel:

$$R_{23(\parallel)} = \frac{1}{\frac{1}{R_2} + \frac{1}{R_3}} = \frac{R_2 R_3}{R_2 + R_3} = \frac{6\ \Omega \cdot 3\ \Omega}{6\ \Omega + 3\ \Omega} = 2\ \Omega.$$

Then, from our sketch we can see that  $R_1$  and  $R_{23(\parallel)}$  are connected in series. Therefore, the total resistance of the circuit will be:

$$R_T = R_1 + R_{23(\parallel)} = 1\ \Omega + 2\ \Omega = 3\ \Omega.$$

### Answer:

$$R_T = 3\ \Omega.$$