

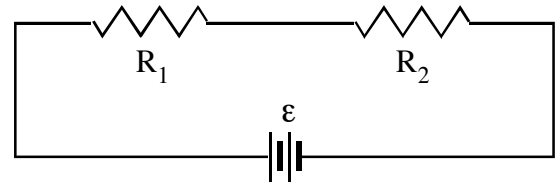
PhyzJob: Series Circuits NUMBER PUZZLES



Apply Ohm's law, Joule's law, and your understanding of the nature of series circuits to solve the numerical problems that follow.

Ex. If $\epsilon = 12\text{ V}$, $R_1 = 3.0\ \Omega$ and $R_2 = 6.0\ \Omega$, what is

- the equivalent resistance of the circuit?
- the total current in the circuit?
- the power dissipated in R_1 ?
- the voltage across R_2 ?



a. $R_{EQ} = R_1 + R_2$ (for series circuit)
 $R_{EQ} = 3.0 + 6.0$
 $R_{EQ} = 9.0$

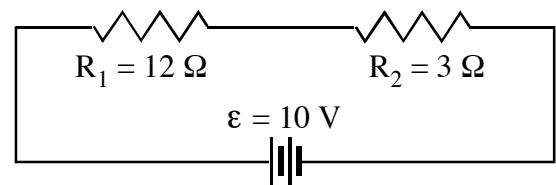
b. $I = \epsilon / R_{EQ}$
 $I = 12\text{ V} / 9.0$
 $I = 1.3\text{ A}$

c. $P_1 = I^2 R_1$
 $P_1 = (1.3\text{ A})^2 \cdot 3.0$
 $P_1 = 5.1\text{ W}$

d. $V_2 = IR_2$
 $V_2 = 1.3\text{ A} \cdot 6.0$
 $V_2 = 8.0\text{ V}$

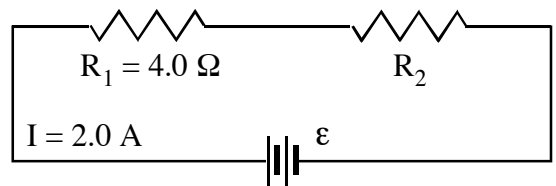
1. If $\epsilon = 10\text{ V}$, $R_1 = 12\ \Omega$ and $R_2 = 3.0\ \Omega$, what is

- the equivalent resistance of the circuit?
- the total current in the circuit?
- the power dissipated in R_1 ?
- the voltage across R_2 ?



2. If $I = 2.0\text{ A}$, $R_1 = 4.0\ \Omega$, and $V_2 = 5.0\text{ V}$, what is

- the voltage across R_1 ?
- the resistance of R_2 ?
- the power dissipated in the circuit?
- the voltage of the battery?



3. If $\varepsilon = 24 \text{ V}$, $R_1 = 8.0 \ \Omega$, and $R_2 = 6.0 \ \Omega$, what is the current through R_2 ?

4. If $\varepsilon = 9.0 \text{ V}$, $R_1 = 5.0 \ \Omega$, and $R_2 = 13 \ \Omega$, what is the power dissipated in the circuit?

5. If $I = 0.75 \text{ A}$, $R_1 = 6 \ \Omega$, and $R_2 = 15 \ \Omega$, what is the voltage

a. across R_1 ?

b. across R_2 ?

c. of the battery?