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Section _____

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The Masters School

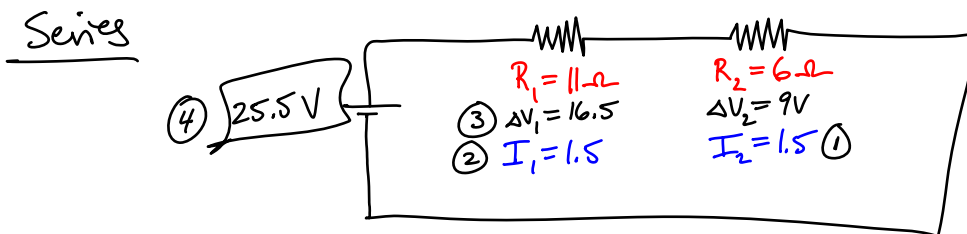
Mr. Alex Rawson

Physics

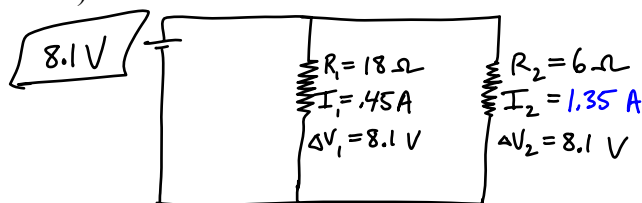


Circuitry III

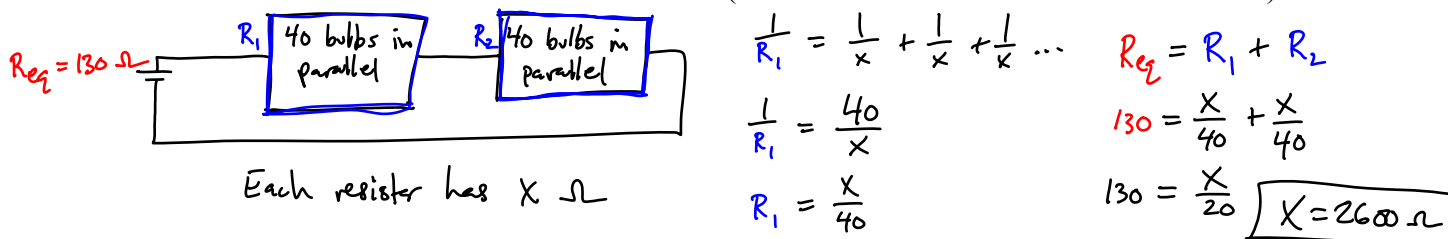
1. An $11.0\ \Omega$ resistor and a $6.0\ \Omega$ resistor are connected in series with a battery. The potential difference across the $6.0\ \Omega$ resistor is measured as 9 V . Find the potential difference across the battery. (Your answer should be between $20 - 30\text{ Volts}$)



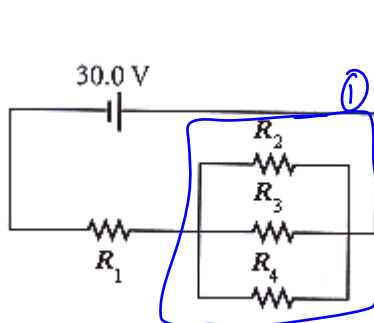
2. A $18.0\ \Omega$ resistor and a $6.0\ \Omega$ resistor are connected in parallel to a battery, and the current in the $18.0\ \Omega$ resistor is found to be 0.45 A . Find the potential difference across the battery. (Your answer should be between $5 - 10\text{ Volts}$)



3. Two identical parallel-wired strings of 40 bulbs are connected to each other in series. If the equivalent resistance of the combination is $130.0\ \Omega$ when it is connected across a potential difference of 120.0 V , what is the resistance of each individual bulb? (Your answer should be between $2 - 3\text{ k}\Omega$)



4. Find the equivalent resistance of the circuit shown below, if $R_1 = 13.0\ \Omega$, $R_2 = 24.0\ \Omega$, $R_3 = 10.0\ \Omega$ and $R_4 = 3.0\ \Omega$. (Your answer should be between $15 - 20\ \Omega$)



① $\frac{1}{R_{eq}} = \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$

$\frac{1}{R_{eq}} = \frac{1}{24} + \frac{1}{10} + \frac{1}{3}$

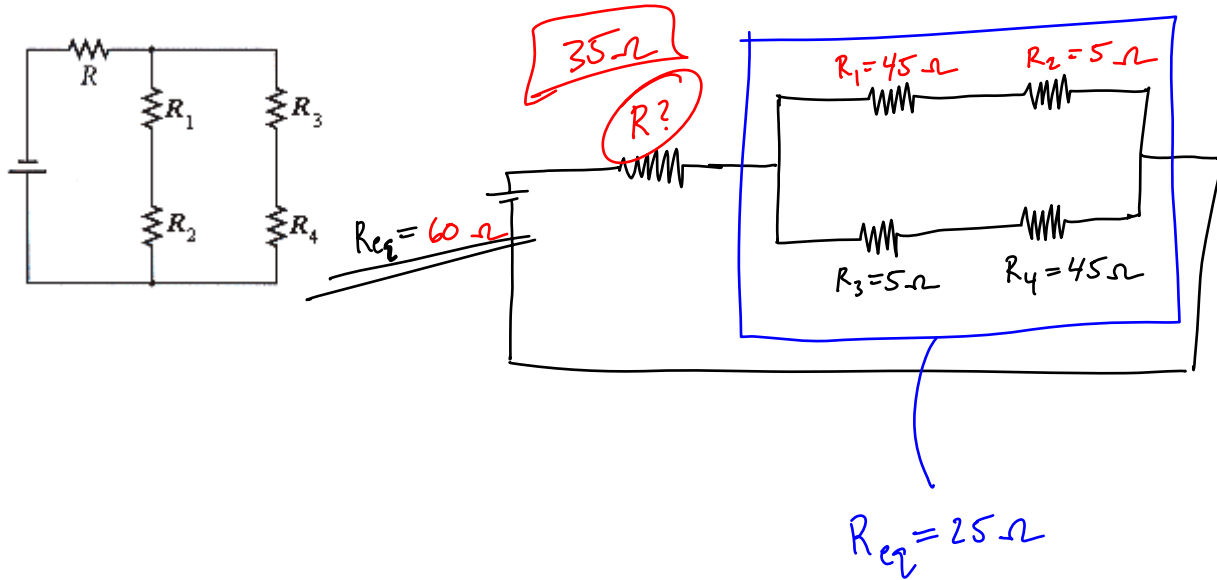
$R_{eq} = 2.105\ \Omega$

$R_{eq} = ① + 13$

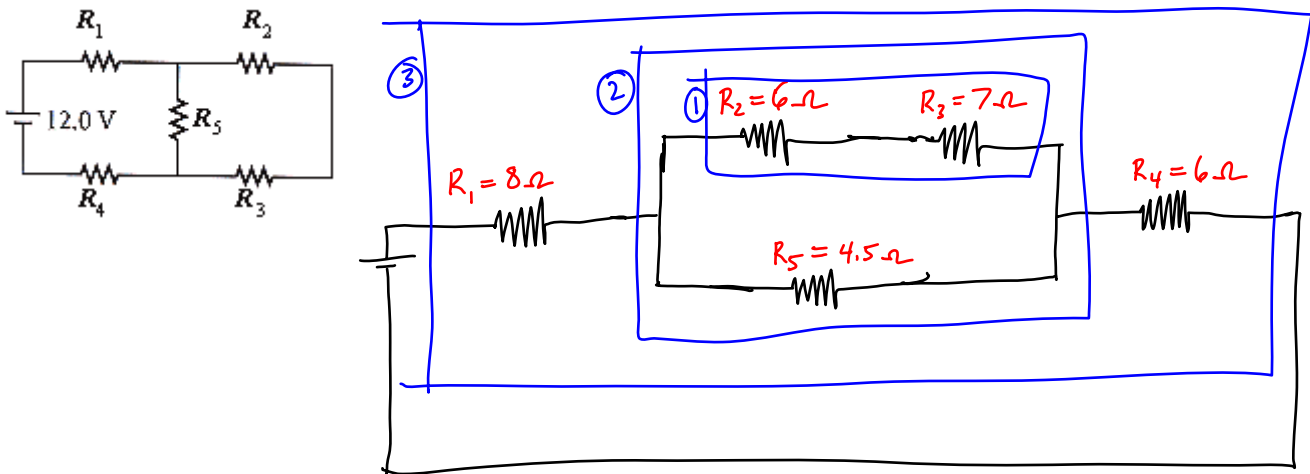
$R_{eq} = 2.11 + 13$

$R_{eq} = 15.11\ \Omega$

5. The equivalent resistance of the circuit below is $60.0\ \Omega$. If $R_1 = 45.0\ \Omega$, $R_2 = 5.0\ \Omega$, $R_3 = 5.0\ \Omega$ and $R_4 = 45.0\ \Omega$, find the resistance of R . (Your answer should be between $34 - 40\ \Omega$)



6. Re-draw the schematic diagram below, and then find the equivalent resistance of the circuit. Let $R_1 = 8.0\ \Omega$, $R_2 = 6.0\ \Omega$, $R_3 = 7.0\ \Omega$, $R_4 = 6.0\ \Omega$ and $R_5 = 4.5\ \Omega$. (Your answer should be between $15 - 20\ \Omega$)



$$\begin{aligned}
 1) \quad R_{eq} &= 6 + 7 = 13\ \Omega \\
 2) \quad \frac{1}{R_{eq}} &= \frac{1}{13} + \frac{1}{4.5} = 3.34\ \Omega \\
 3) \quad R_{eq} &= 8 + 3.34 + 6 = 17.34\ \Omega
 \end{aligned}$$