

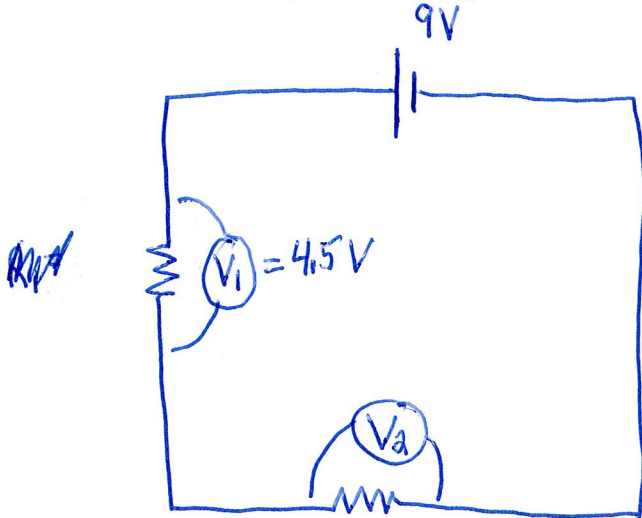
Physics 11 Circuit Analysis – Worksheet #2

Kirchoff's Laws



Name: _____

1. Find the required missing values. Show your working in clearly defined steps.



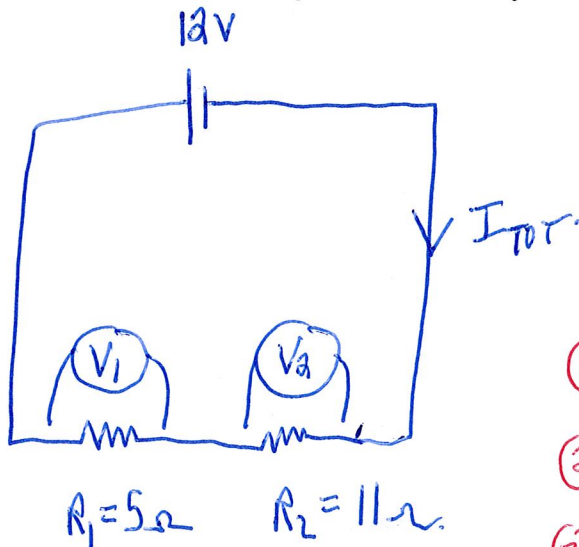
$$V_2 = \underline{4.5V}$$

use Kirchoff's loop rule.
(total $V_{\text{gain}} = \text{total } V_{\text{drop}}$)

$$9 = 4.5 + V_2$$

$$V_2 = 4.5$$

2. Find the required missing values. Show your working in clearly defined steps.



$$I_{\text{TOT}} = \underline{0.75A}$$

$$V_1 = \underline{3.75V} \quad V_2 = \underline{8.25V}$$

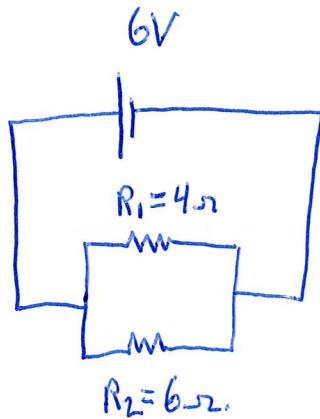
① $R_{\text{TOT}} = 16\Omega$

② $I_{\text{TOT}} = \frac{V}{R} = \frac{12}{16} = 0.75A = I_1 = I_2$

③ $V_1 = I_1 R_1 = (0.75)(5) = 3.75V$

④ $V_2 = I_2 R_2 = (0.75)(11) = 8.25V$

3. Find the required missing values. Show your working in clearly defined steps.



$$I_{TOT} = \underline{1.5A}$$

$$V_1 = \underline{6} \quad V_2 = \underline{6}$$

$$I_1 = \underline{1.5} \quad I_2 = \underline{1}$$

$$\textcircled{1} \frac{1}{R_p} = \frac{1}{4} + \frac{1}{6} \rightarrow R_p = 2.4\Omega$$

$$\textcircled{3} \text{ Using loop rule } V_1 = 6V \quad V_2 = 6V$$

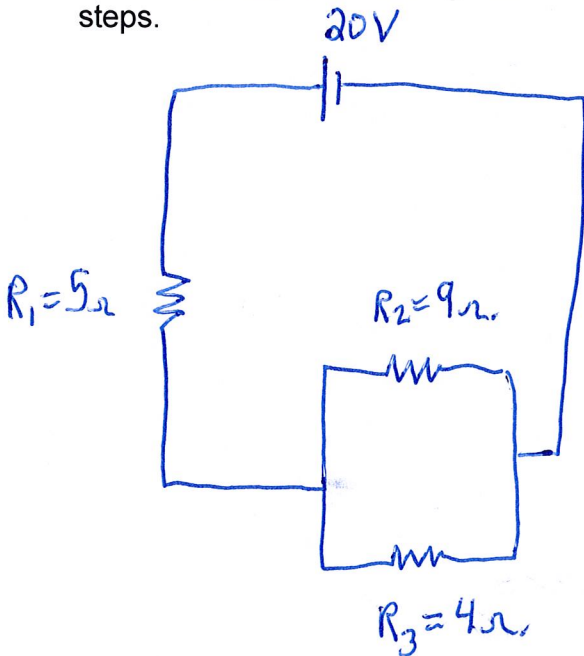
$$\textcircled{2} I_{TOT} = \frac{V}{R} = \frac{6}{2.4} = 2.5A$$

$$\textcircled{4} I_1 = \frac{V_1}{R_1} = \frac{6}{4} = 1.5A$$

$$\textcircled{5} I_1 + I_2 = I_{TOT} \rightarrow I_2 = 1A$$

$$1.5 + I_2 = 2.5$$

4. Find the required missing values. Show your working in clearly defined (boxed) steps.



$$I_{TOT} = 2.57A \quad V_1 = \underline{12.9}$$

$$V_2 = \underline{7.13} \quad V_3 = \underline{7.13}$$

$$\textcircled{1} \frac{1}{R_p} = \frac{1}{9} + \frac{1}{4} \quad R_p = 2.76\Omega$$

$$\textcircled{2} R_{TOT} = 5 + 2.76 = 7.76\Omega$$

$$\textcircled{3} I_{TOT} = \frac{20V}{7.76} = 2.57A$$

$$\textcircled{4} V_1 = I_1 R_1 = (2.57)(5) = 12.87V = 12.9V$$

$$\textcircled{5} V_1 + V_2 = 20 \quad V_2 = 7.13V \quad V_3 = 7.13V$$