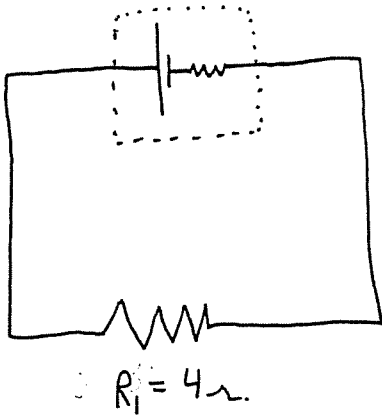


Physics 12 Chapter 18/19 Circuit Analysis Worksheet #3

Name: _____

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



$$E = 1.5 \text{ V}$$

$$r \text{ (internal resistance)} = 0.45 \Omega$$

$$V_T = ? \quad I = ?$$

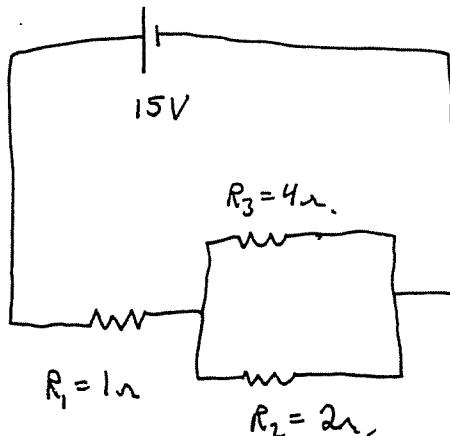
$$\textcircled{1} R_{TOT} = 4.45 \Omega$$

$$\textcircled{2} I_{TOT} = \frac{V}{R} = \frac{1.5}{4.45} = 0.337 \text{ A}$$

$$\begin{aligned} \textcircled{3} \quad V_T &= E - Ir \\ &= 1.5 - (0.337)(0.45) \\ V_T &= 1.348 \text{ V} \end{aligned}$$

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

$$\begin{aligned} P &= V \cdot I \\ &= V \frac{V}{R} \\ &= \frac{V^2}{R} \end{aligned}$$



What power is dissipated by R_2 ? $\hookrightarrow P = V_2 \cdot I_2$

$$\textcircled{1} R_{TOT} = 2.333 \Omega$$

$$\textcircled{2} I_{TOT} = \frac{V}{R} = \frac{15}{2.333} = 6.429 \text{ A}$$

$$\textcircled{3} V_1 = IR = 6.429 \text{ V}$$

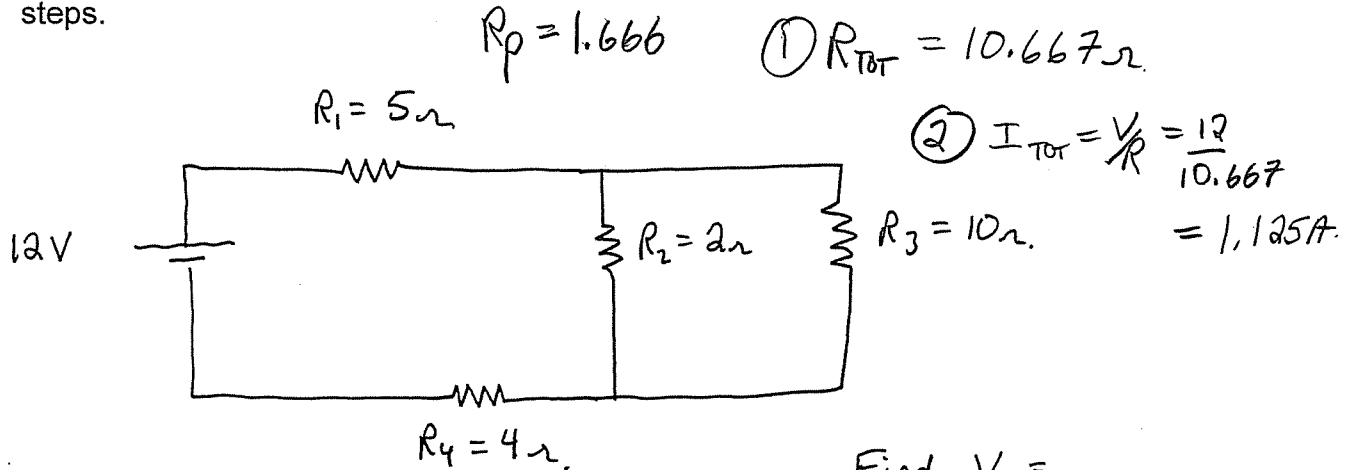
$$\textcircled{4} V_2 = V_3 \quad V_{GAIN} = V_{LOSS}$$

$$15 = V_1 + V_2$$

$$V_2 = 8.571 \text{ V}$$

$$\begin{aligned} \textcircled{5} \quad P &= \frac{V^2}{R} = \frac{(8.571)^2}{2} \\ &= 36.7 \text{ W} \end{aligned}$$

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



③ $V_4 = IR = (1.125)(4) = 4.500V$

④ $V_1 = IR = (1.125)(5) = 5.625V$

⑤ $V_{GAIN} = V_{LOSS}$ (for any loop)
 $12V = V_1 + V_3 + V_4$ $V_3 = 1.875V$

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

