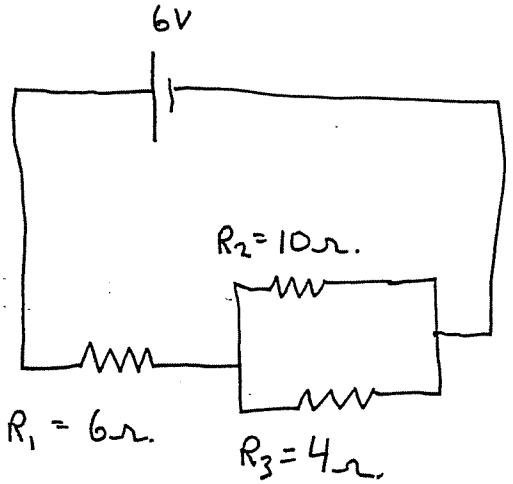
Physics 12 Chapter 18/19 Circuit Analysis Worksheet #2

Name: _____

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



$I_1 =$ ____ $V_1 =$ ____

$I_2 =$ ____ $V_2 =$ ____

$I_3 =$ ____ $V_3 =$ ____

① $R_{TOT} = 6. + 2.857 = 8.857$

② $I_{TOT} = I_1 = \frac{V}{R} = \frac{6}{8.857} = 0.6774\,A$

③ $V_1 = I_1 R_1 = (.6774)(6) = 4.064\,A$

④ $V_{GAIN} = V_{LOSS}$ (for any loop)

$6V = V_1 + V_2 \quad V_2 = 1.935V$

⑤ $V_2 = V_3 \quad V_3 = 1.935V$

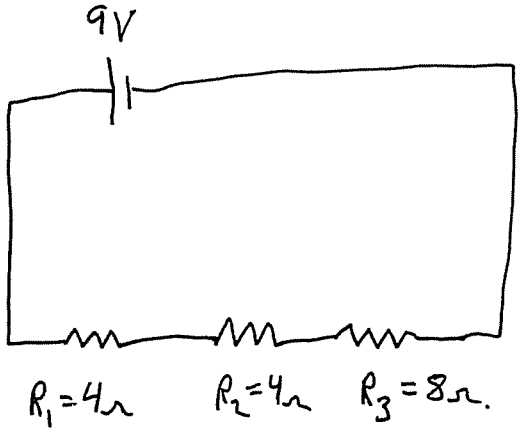
⑥ $I_2 = \frac{V}{R} = \frac{1.935}{10} = .1935A$

⑦ $I_{IN} = I_{OUT}$

$0.6774 = I_2 + I_3$

$I_3 = 0.4839A$

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



$I_1 =$ ____

$V_1 =$ ____

$V_3 =$ ____

① $R_{TOT} = 16\Omega$

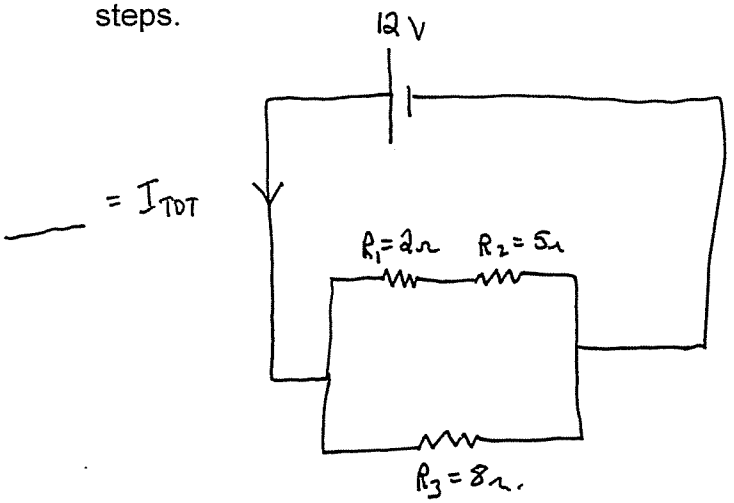
② $I_{TOT} = I_1 = I_2 = I_3$

$= \frac{V}{R} = \frac{9V}{16} = 0.5625A$

③ $V_1 = IR_1 = 2.25\,V$

$V_3 = IR_3 = 4.5\,V$

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



$\_\_\_ = I_{TOT}$

$V_1 = \_\_\_$ $I_1 = \_\_\_$

$V_2 = \_\_\_$ $I_2 = \_\_\_$

$V_3 = \_\_\_$ $I_3 = \_\_\_$

① $R_{TOT} = 3.733\Omega$

② $I_{TOT} = \frac{V}{R} = \frac{12}{3.73} = 3.217\ A$

③ $V_{GAIN} = V_{LOSS}$

$12V = V_3$

④ $I_3 = \frac{V_3}{R_3} = \frac{12}{8} = 1.5A$

⑤ $I_{IN} = I_{OUT}$

$I_{TOT} = I_1 + I_3$ $I_1 = 1.717A$

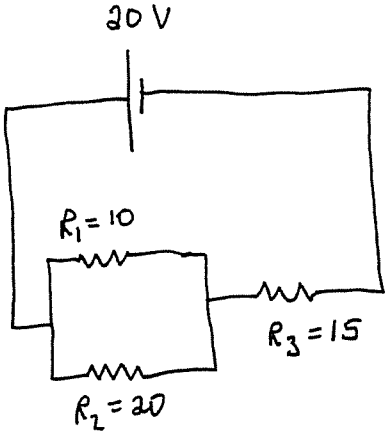
⑥ $V_1 = I_1 R_1$

$= 3.434V$

$I_1 = I_2$

$V_2 = I_1 R_2 = 8.585$

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



$V_1 = \_\_\_$ $I_1 = \_\_\_$

$V_2 = \_\_\_$ $I_2 = \_\_\_$

$V_3 = \_\_\_$ $I_3 = \_\_\_$

① $R_{TOT} = 21.667\Omega$

② $I_{TOT} = \frac{V}{R} = \frac{20}{21.667} = 0.9231\ A$

③ $V_3 = IR_3 = 13.846V$

④ $V_{GAIN} = V_{LOSS}$

$20V = V_3 + V_1$

$V_1 = 6.154V = V_2$

$V_1 = V_2$

⑤ $I_1 = \frac{V_1}{R_1} = \frac{6.154}{10} = 0.6154$

⑥ $I_2 = \frac{V_2}{R_2} = \frac{6.154}{20} = 0.3077$