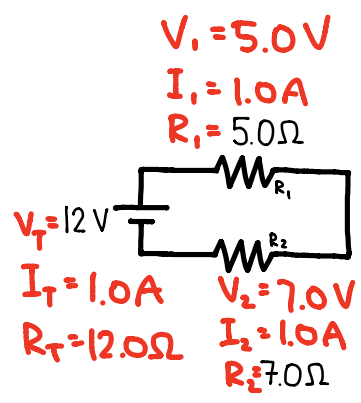


# SERIES AND PARALLEL CIRCUITS - SOL'NS

1.



①  $R_T = R_1 + R_2$   
 $= 5.0 + 7.0$   
 $= 12.0\Omega$

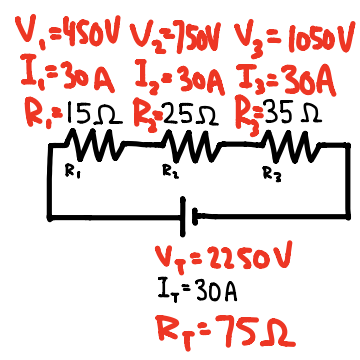
②  $V_T = I_T R_T$   
 $I_T = \frac{V_T}{R_T}$   
 $= \frac{12}{12.0}$   
 $= 1.0A$

③  $I_T = I_1 = I_2$   
 $I_1 = 1.0A$   
 $I_2 = 1.0A$

④  $V_1 = I_1 R_1$   
 $= (1.0)(5.0)$   
 $= 5.0V$

⑤  $V_2 = I_2 R_2$   
 $= (1.0)(7.0)$   
 $= 7.0V$

2.



①  $R_T = R_1 + R_2 + R_3$   
 $= 15 + 25 + 35$   
 $= 75\Omega$

②  $I_T = I_1 = I_2 = I_3$   
 $I_1 = 30A$   
 $I_2 = 30A$   
 $I_3 = 30A$

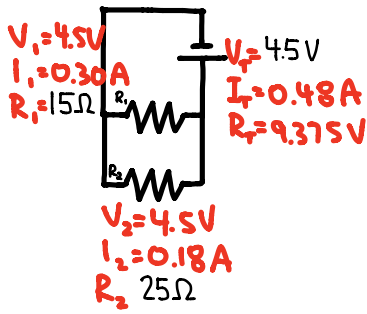
③  $V_T = I_T R_T$   
 $= (30)(75)$   
 $= 2250V$

④  $V_1 = I_1 R_1$   
 $= (30)(15)$   
 $= 450V$

⑤  $V_2 = I_2 R_2$   
 $= (30)(25)$   
 $= 750V$

⑥  $V_3 = I_3 R_3$   
 $= (30)(35)$   
 $= 1050V$

3.



①  $V_T = V_1 = V_2$   
 $V_1 = 4.5V$   
 $V_2 = 4.5V$

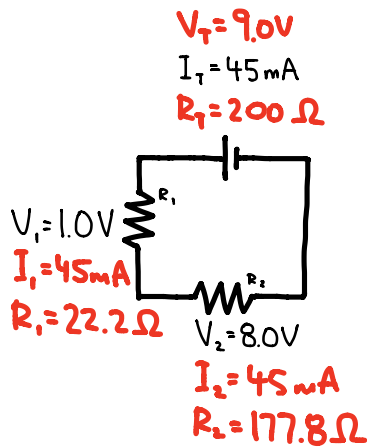
②  $V_1 = I_1 R_1$   
 $I_1 = \frac{V_1}{R_1}$   
 $= \frac{4.5}{15}$   
 $= 0.30A$

③  $V_2 = I_2 R_2$   
 $I_2 = \frac{V_2}{R_2}$   
 $= \frac{4.5}{25}$   
 $= 0.18A$

④  $I_T = I_1 + I_2$   
 $= 0.3 + 0.18$   
 $= 0.48A$

⑤  $V_T = I_T R_T$   
 $R_T = \frac{V_T}{I_T}$   
 $= \frac{4.5}{0.48}$   
 $= 9.375\Omega$

4.



①  $I_T = I_1 = I_2$   
 $I_1 = 45mA$   
 $I_2 = 45mA$

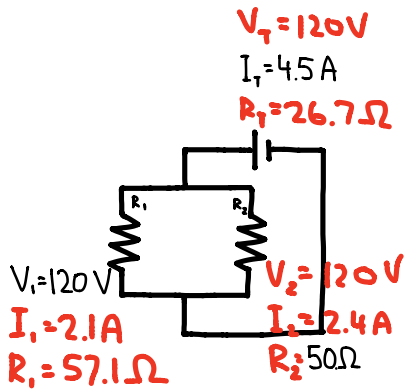
②  $V_1 = I_1 R_1$   
 $R_1 = \frac{V_1}{I_1}$   
 $= \frac{1.0}{0.045}$   
 $= 22.\bar{2}\Omega$

③  $V_2 = I_2 R_2$   
 $R_2 = \frac{V_2}{I_2}$   
 $= \frac{8.0}{0.045}$   
 $= 177.\bar{7}\Omega$

④  $V_T = V_1 + V_2$   
 $= 1.0 + 8.0$   
 $= 9.0V$

⑤  $R_T = R_1 + R_2$   
 $= 22.\bar{2} + 177.\bar{7}$   
 $= 200\Omega$

5.



①  $V_T = V_1 = V_2$   
 $V_T = 120V$   
 $V_2 = 120V$

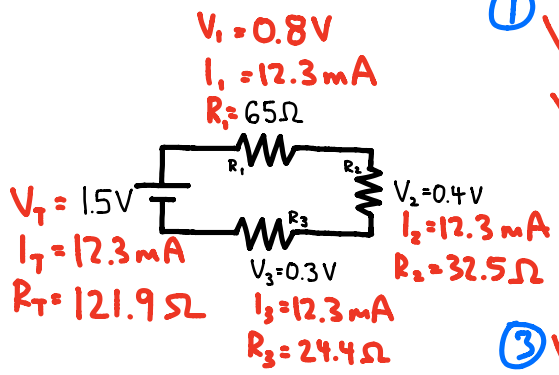
②  $V_2 = I_2 R_2$   
 $I_2 = \frac{V_2}{R_2}$   
 $= \frac{120}{50}$   
 $= 2.4A$

③  $I_T = I_1 + I_2$   
 $I_1 = I_T - I_2$   
 $= 4.5 - 2.4$   
 $= 2.1A$

④  $V_T = I_T R_T$   
 $R_T = \frac{V_T}{I_T}$   
 $= \frac{120}{4.5}$   
 $= 26.7\Omega$

⑤  $V_1 = I_1 R_1$   
 $R_1 = \frac{V_1}{I_1}$   
 $= \frac{120}{2.1}$   
 $= 57.1\Omega$

6.



①  $V_T = V_1 + V_2 + V_3$   
 $V_1 = V_T - V_2 - V_3$   
 $= 1.5 - 0.4 - 0.3$   
 $= 0.8V$

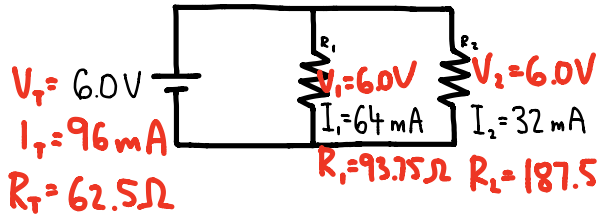
②  $V_1 = I_1 R_1$   
 $I_1 = \frac{V_1}{R_1}$   
 $= \frac{0.8}{65}$   
 $= 0.0123A$   
 $= 12.3mA$

③  $V_T = I_T R_T$   
 $R_T = \frac{V_T}{I_T}$   
 $= \frac{1.5}{0.0123}$   
 $= 121.9\Omega$

④  $V_2 = I_2 R_2$   
 $R_2 = \frac{V_2}{I_2}$   
 $= \frac{0.4}{0.0123}$   
 $= 32.5\Omega$

⑤  $V_3 = I_3 R_3$   
 $R_3 = \frac{V_3}{I_3}$   
 $= \frac{0.3}{0.0123}$   
 $= 24.4\Omega$

7.



①  $V_T = V_1 = V_2$

$V_1 = 6.0V$

$V_2 = 6.0V$

②  $I_T = I_1 + I_2$

$= 0.064 + 0.032$

$= 0.096A$

$= 96mA$

③  $V_T = I_T R_T$

$R_T = \frac{V_T}{I_T}$

$= \frac{6.0}{0.096}$

$= 62.5\Omega$

④  $V_1 = I_1 R_1$

$R_1 = \frac{V_1}{I_1}$

$= \frac{6.0}{0.064}$

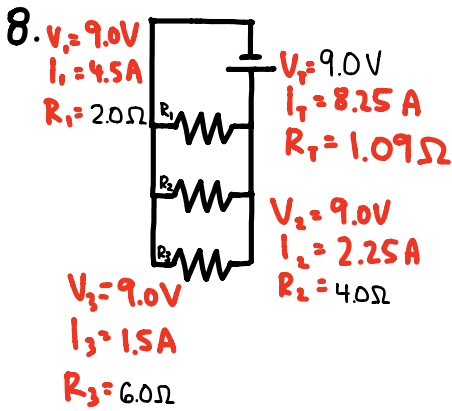
$= 93.75\Omega$

⑤  $V_2 = I_2 R_2$

$R_2 = \frac{V_2}{I_2}$

$= \frac{6.0}{0.032}$

$= 187.5\Omega$



①  $V_T = V_1 = V_2 = V_3$

$V_1 = 9.0V$

$V_2 = 9.0V$

$V_3 = 9.0V$

②  $V_1 = I_1 R_1$

$I_1 = \frac{V_1}{R_1}$

$= \frac{9.0}{2.0}$

$= 4.5A$

③  $V_2 = I_2 R_2$

$I_2 = \frac{V_2}{R_2}$

$= \frac{9.0}{4.0}$

$= 2.25A$

④  $V_3 = I_3 R_3$

$I_3 = \frac{V_3}{R_3}$

$= \frac{9.0}{6.0}$

$= 1.5A$

⑤  $I_T = I_1 + I_2 + I_3$

$= 4.5 + 2.25 + 1.5$

$= 8.25A$

⑥  $V_T = I_T R_T$

$R_T = \frac{V_T}{I_T}$

$= \frac{9.0}{8.25}$

$= 1.09\Omega$