# Circuit Practice 1

(1) $\Delta V_2 = 3V$

(2) $\Delta V_1 = 8V$

$\Delta V_2 = 16V$

(3) $\Delta V_1 = 4V$

$\Delta V_2 = 9V$

(4) $\Delta V_1 = 4V$ (1)

$\Delta V_2 = 9V$ (2)

$I_1 = I_{AB} - I_3 = 0.25A$

$I_2 = I_1 = 0.25A$ (4)

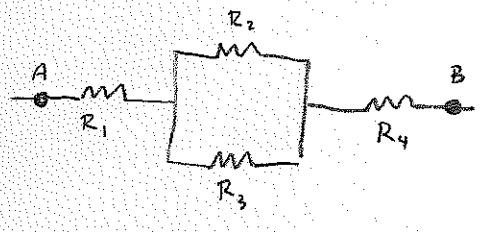
$I_3 = \frac{\Delta V_3}{R_3} = \frac{9V}{12\Omega} = 0.75A$ (3)

$R_1 = \frac{\Delta V_1}{I_1} = \frac{4V}{0.25A} = 16\Omega$ (5)

$R_2 = \frac{\Delta V_2}{I_2} = \frac{5V}{0.25} = 20\Omega$ (6)

* Green numbers indicate the order in which I solved the problems

(5)




$R_1$ and $R_4$ are in series

$R_2$ and $R_3$ are in parallel

$R_{14} = R_1 + R_4 = 4\Omega$

$R_{23} = \left(\frac{1}{R_2} + \frac{1}{R_3}\right)^{-1} = 1\Omega$

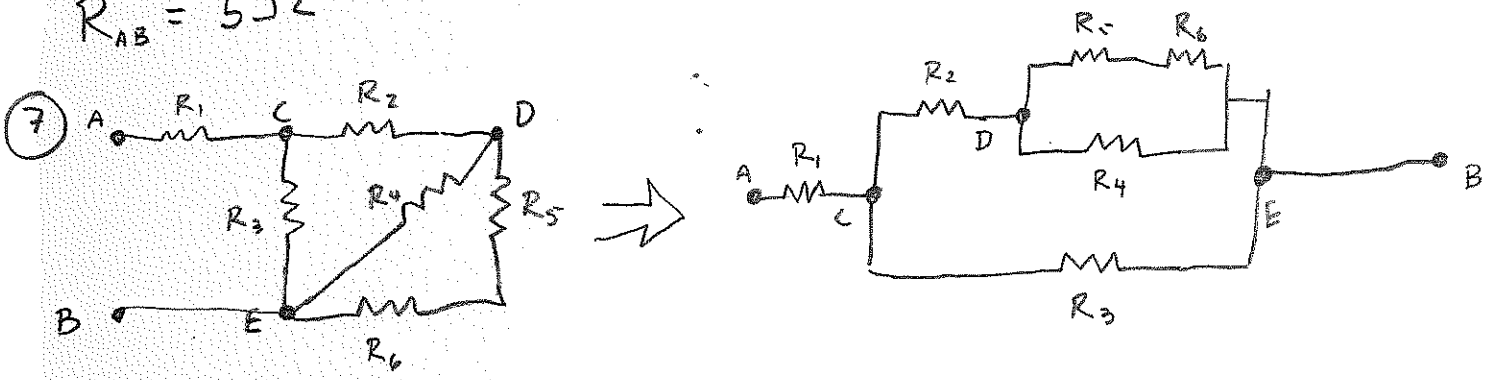
$R_{14}$ and $R_{23}$ are in series

$R_{AB} = R_{14} + R_{23} = 5\Omega$

(6) Same circuit as (5)

$R_{AB} = 5\Omega$

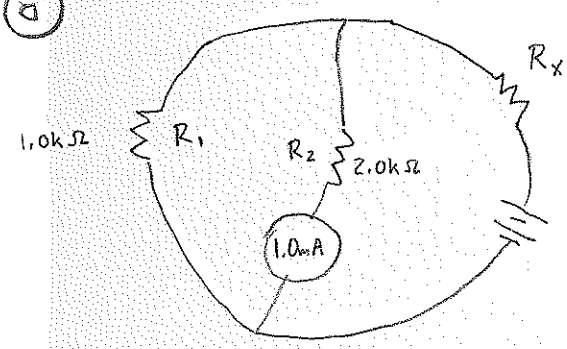
(7)




$R_{56} = R_5 + R_6 = 24\Omega$ ; $R_{456} = \left(\frac{1}{R_4} + \frac{1}{R_{56}}\right)^{-1} = 8\Omega$ ; $R_{2456} = R_2 + R_{456} = 20\Omega$

$R_{23456} = \left(\frac{1}{R_{2456}} + \frac{1}{R_3}\right)^{-1} = 7.5\Omega$ ; $R_{AB} = R_1 + R_{23456} = 19.5\Omega$

(8)




$\Delta V_T = 6.0V$

$\Delta V_1 = \Delta V_2 = I_2 R_2 = 2.0V$

$I_1 = \frac{\Delta V_1}{R_1} = 0.002A = 2.0mA$

$I_T = I_1 + I_2 = 3.0mA$

$\Delta V_x = \Delta V_T - \Delta V_1 = 4.0V$

$R_x = \frac{\Delta V_x}{I_x} = \frac{\Delta V_x}{I_T} = 1333.\overline{3}\Omega$

$R_x = 1300\Omega = 1.3k\Omega$