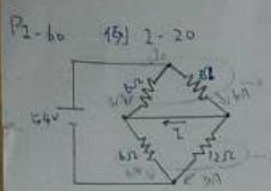


$$I = \frac{\frac{1}{\frac{1}{2} + \frac{1}{5} + \frac{1}{4}} \times 4 = \frac{\frac{1}{5}}{\frac{1}{10} + \frac{1}{5} + \frac{1}{10}} \times 4 = \frac{\frac{1}{5}}{\frac{4}{10}} \times 4 = \frac{1}{5} \times 4 = \frac{4}{5} \times 4 = \frac{16}{5} = 3.2 \text{ A}$$

$\left(\frac{1}{\frac{1}{2} + \frac{1}{5} + \frac{1}{4}} \right) \times 4 = 2 \text{ A}$ (Note: This part of the calculation in the image seems to be a different path or correction)

< 3 個 R 的 1/2 E 的 1/3 >



$$6 \parallel 3 = \frac{18}{9} = 2 \Omega$$

$$6 \parallel 12 = \frac{72}{18} = 4 \Omega$$

$$I_a = \frac{54}{6} = 9 \text{ A}$$

$$6 \Omega: 9 \times \frac{3}{9} = 3 \text{ A}$$

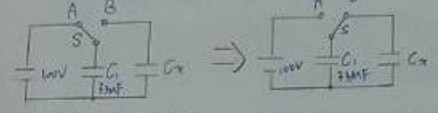
$$3 \Omega: 9 \times \frac{6}{9} = 6 \text{ A}$$

$$6 \Omega: 9 \times \frac{12}{18} = 6 \text{ A}$$

$$12 \Omega: 9 \times \frac{6}{18} = 3 \text{ A}$$

$$I = 6 \text{ A} - 3 \text{ A} = 3 \text{ A}$$

P1-71 (例) 1-22



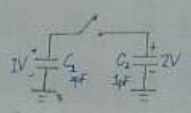
$$75 C_1 + 75 C_x = 100 C_1 \Rightarrow C_x = \frac{25}{75} C_1 = \frac{1}{3} C_1$$

$$75 C_x = 25 C_1$$

$$E_c = \frac{E C_1}{C_1 + C_x} \Rightarrow 75 = \frac{100 C_1}{C_1 + C_x} \Rightarrow 75 C_x = 25 C_1 \Rightarrow C_x = \frac{1}{3} C_1$$

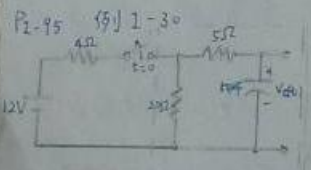
$$\Rightarrow C_x = \frac{1}{3} \times 33 = 11 \text{ nF}$$

P2-71 (例) 1-23



$$Q_T = C_1 V_1 + C_2 V_2 = (C_1 + C_2) V$$

$$V = \frac{C_1 V_1 + C_2 V_2}{C_1 + C_2} = \frac{2 \times 1 + 1 \times 2}{2 + 1} = \frac{2 + 2}{3} = \frac{4}{3} \text{ V}$$



$$\tau = RC = 25 \times 50 \times 10^{-6} = 1.25 \times 10^{-3}$$

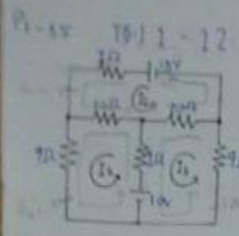
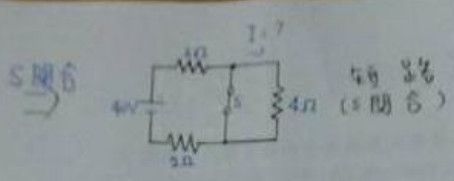
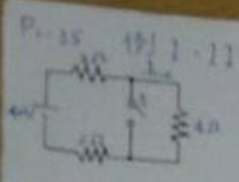
$$V_c(t=0) = 12 \times \frac{20}{20+4} = 12 \times \frac{20}{24} = 10 \text{ V}$$

開合瞬間, C 短路
50 串連, C 斷路

$$V_c(t) = E e^{-\frac{t}{\tau}} = 10 e^{-\frac{t}{1.25 \times 10^{-3}}}$$

$$\frac{1}{\tau} = \frac{1}{1.25 \times 10^{-3}} = 800$$

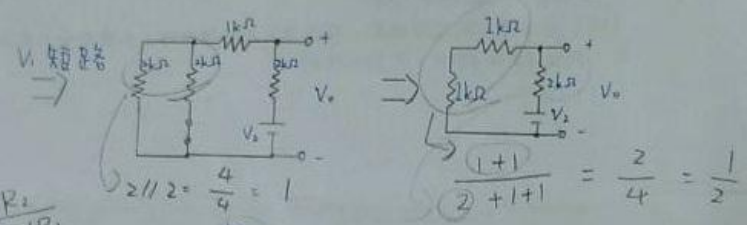
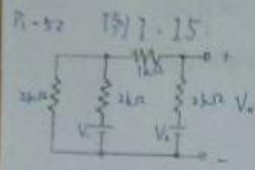
RC 的 電 (E e^{-t/τ})



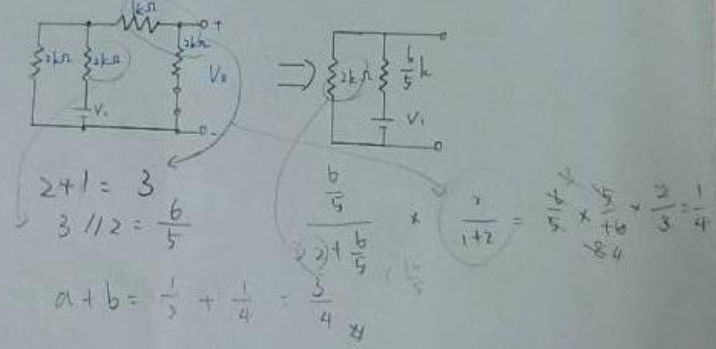
$$\begin{aligned}
 a_{11}I_1 + a_{12}I_2 + a_{13}I_3 &= 15 \\
 a_{21}I_1 + a_{22}I_2 + a_{23}I_3 &= 10 \\
 a_{31}I_1 + a_{32}I_2 + a_{33}I_3 &= -10 \\
 \text{求 } a_{11} + a_{22} + a_{33} &=?
 \end{aligned}$$

$$\begin{aligned}
 (1+10+10)I_1 + (-10)I_2 + (-10)I_3 &= 15 \\
 \Rightarrow 21I_1 - 10I_2 - 10I_3 &= 15 \\
 (-10)I_1 + (1+10+9)I_2 + (-1)I_3 &= 10 \\
 \Rightarrow -10I_1 + 20I_2 - I_3 &= 10 \\
 (-10)I_1 + (-1)I_2 + (9+10+1)I_3 &= -10 \\
 \Rightarrow -10I_1 - I_2 + 20I_3 &= -10
 \end{aligned}$$

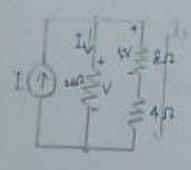
$$\begin{aligned}
 a_{11} &= 21, a_{22} = 20, a_{33} = 20 \\
 21 + 20 + 20 &= 61
 \end{aligned}$$



$$\begin{aligned}
 \frac{V_0}{V_S} &= \frac{R_2}{R_1 + R_2} \\
 \frac{V_0}{V_S} &= \frac{R_1}{R_1 + R_2}
 \end{aligned}$$



P1-60 例 1-18:



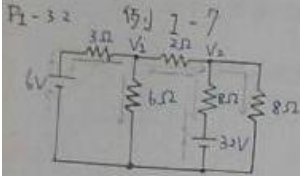
$$\begin{aligned}
 V \times \frac{8}{8+4} &= 5 \Rightarrow V \times \frac{8}{12} = 5 \Rightarrow V = 5 \times \frac{12}{8} = \frac{60}{8} \\
 4\Omega \text{ 的 } V &= \frac{4}{12} \times \frac{60}{8} = \frac{20}{8} \\
 I_2 &= \frac{V}{20} = \frac{20/8}{20} = \frac{3}{8} \text{ A} \\
 I_1 &= \frac{V}{12} = \frac{60/8}{12} = \frac{5}{8} \\
 I = I_1 + I_2 &= \frac{5}{8} + \frac{3}{8} = \frac{8}{8} = 1 \text{ A}
 \end{aligned}$$

P1-30 例 1-6

$$R = \rho \frac{l}{A} = 1.723 \times 10^{-8} \cdot \frac{50}{\pi \left(\frac{1.63 \times 10^{-3}}{2} \right)^2} = 0.412 \Omega$$

$$A = \pi r^2 = \pi \left(\frac{1.63 \times 10^{-3}}{2} \right)^2$$

$$A = 0.412 \Omega$$



$$V_2 \cdot \frac{V_1 - 6}{3} + \frac{V_1}{6} + \frac{V_1 - V_2}{2} = 0$$

$$\Rightarrow \frac{2V_1 - 12}{6} + \frac{V_1}{6} + \frac{2V_1 - 3V_2}{6} = 0$$

$$\Rightarrow 2V_1 - 12 + V_1 + 2V_1 - 3V_2 = 0$$

$$\Rightarrow 6V_1 - 3V_2 = 12 \Rightarrow 2V_1 - V_2 = 4 \quad \text{--- ①}$$

$$V_2 \cdot \frac{V_2 - V_1}{2} + \frac{V_2 - 32}{8} + \frac{V_2}{8} = 0$$

$$\Rightarrow \frac{4V_2 - 4V_1}{8} + \frac{V_2 - 32}{8} + \frac{V_2}{8} = 0$$

$$\Rightarrow 4V_2 - 4V_1 + V_2 - 32 + V_2 = 0$$

$$\Rightarrow 6V_2 - 4V_1 = 32$$

$$\Rightarrow -6V_2 + 4V_1 = -32$$

$$\Rightarrow -3V_2 + 2V_1 = -16 \Rightarrow 2V_1 = -16 + 3V_2 \quad \text{--- ②}$$

②代入①

②代入①:

$$-16 + 3V_2 - V_2 = 4$$

$$\Rightarrow 2V_2 = 4 + 16$$

$$\Rightarrow 2V_2 = 20$$

$$\Rightarrow V_2 = 10 \quad \text{--- ③ 代入②}$$

③代入②:

$$2V_1 - 10 = 4$$

$$\Rightarrow 2V_1 = 14$$

$$\Rightarrow V_1 = 7$$

$$A: V_1 = 7, V_2 = 10$$