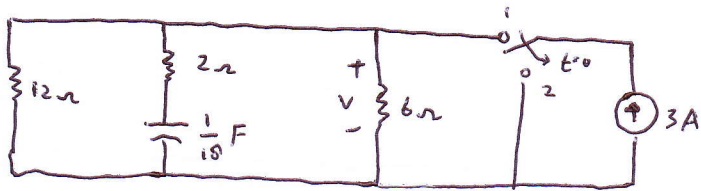
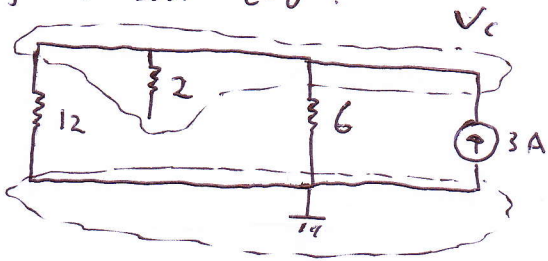


Tentukan v untuk $v(t > 0)$?



Jawab:

Rangkaian saat $t = 0^-$:



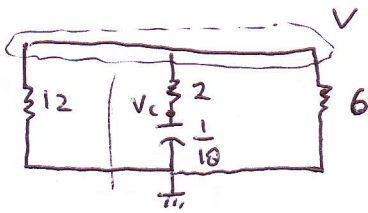
Menggunakan KCL:

$$\frac{V_c}{12} + \frac{V_c}{6} - 3 = 0 \quad \times 12$$

$$3V_c = 3 \cdot 12$$

$$V_c = 12 \text{ volt}$$

Rangkaian saat $t = 0^+$:



KCL node V :

$$\frac{V}{12} + \frac{V - V_c}{2} + \frac{V}{6} = 0 \quad \times 12$$

$$V + 6V - 6V_c + 2V = 0$$

$$9V = 6V_c$$

$$V = \frac{6}{9} V_c$$

KCL node V_c :

$$\frac{V_c - V}{2} + \frac{1}{18} \frac{dV_c}{dt} = 0 \quad \times 18$$

$$9V_c - 9V + \frac{dV_c}{dt} = 0$$

$$9V_c - 6V_c + \frac{dV_c}{dt} = 0$$

$$\frac{dV_c}{dt} = -3V_c$$

$$\int \frac{dV_c}{V_c} = \int -3 dt$$

~~$$V_c = e^k \cdot e^{-3t}$$~~

$$\ln V_c = -3t + k$$

$$V_c = e^k \cdot e^{-3t}$$

Saat $t = 0$

$$12 = e^k \cdot 1$$

$$\therefore V_c = 12 \cdot e^{-3t}$$

$$V = \frac{6}{9} \cdot 12 \cdot e^{-3t}$$

$$V = 8 \cdot e^{-3t}$$