



$$q_s(t) = 2k_1 t + k_2 t^2 \quad \text{C} \quad - (1)$$

Geht von $i(0) = 4A$, $i(3) = -4A$

$$i = \frac{dq_s}{dt}, \quad i(t) = \frac{dq_s(t)}{dt} \quad - (2)$$

$$i(0) = 4A$$

$$\underline{i(t)} = \frac{dq_s(t)}{dt} = \frac{d}{dt} 2k_1 t + \frac{d}{dt} k_2 t^2 = \underline{2k_1 + 2k_2 t}$$

$$i(t) = 2k_1 + 2k_2 t$$

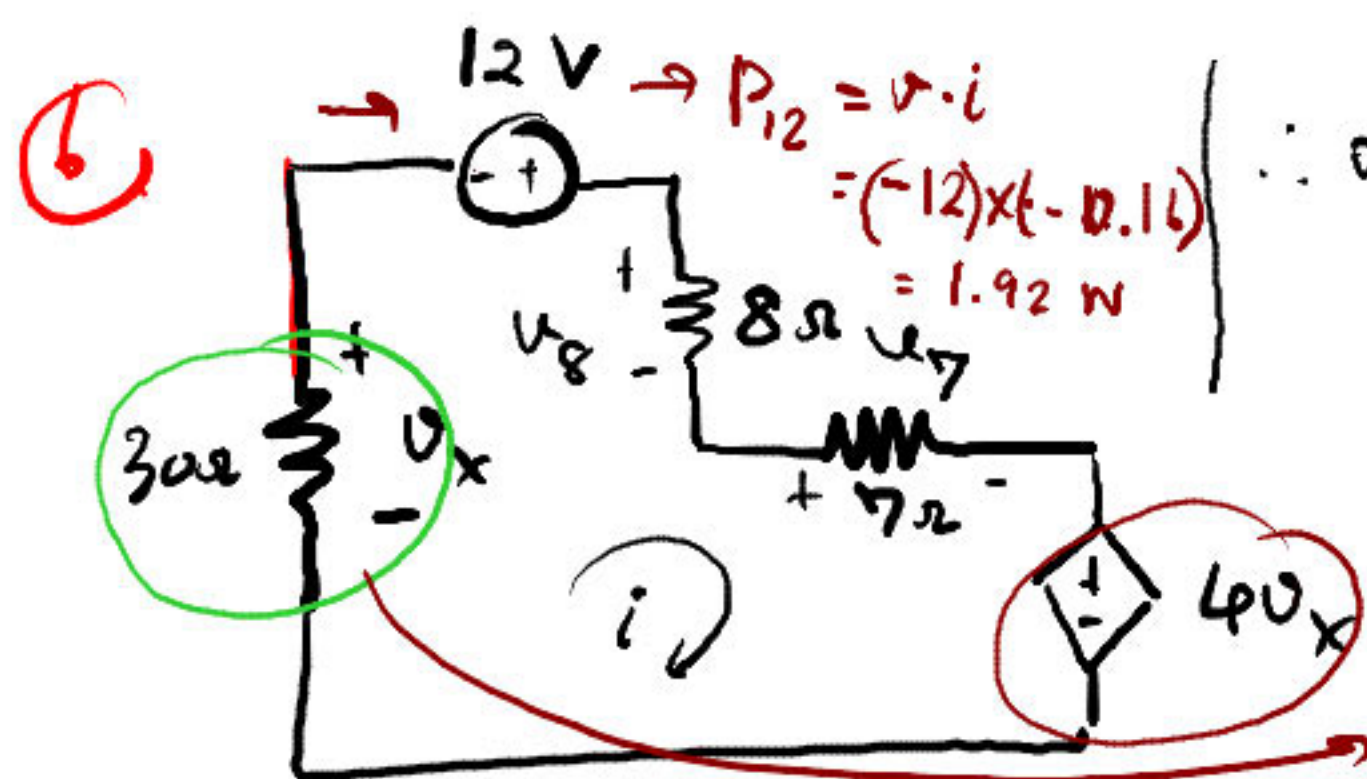
$$\Rightarrow i(0) = 2k_1 + 2k_2(0) = 4$$

$$= 2k_1 = 4$$

$$\therefore k_1 = 2$$

$$\Rightarrow i(3) = \dots$$

$$k_2 = \dots$$



$\therefore 0.16$ ②

$$i = \frac{12}{-75} = -0.16A$$

$$P = v_i = i^2 \cdot R$$

$$P_{30\Omega} = (-0.16)^2 \times (30) = 0.768$$

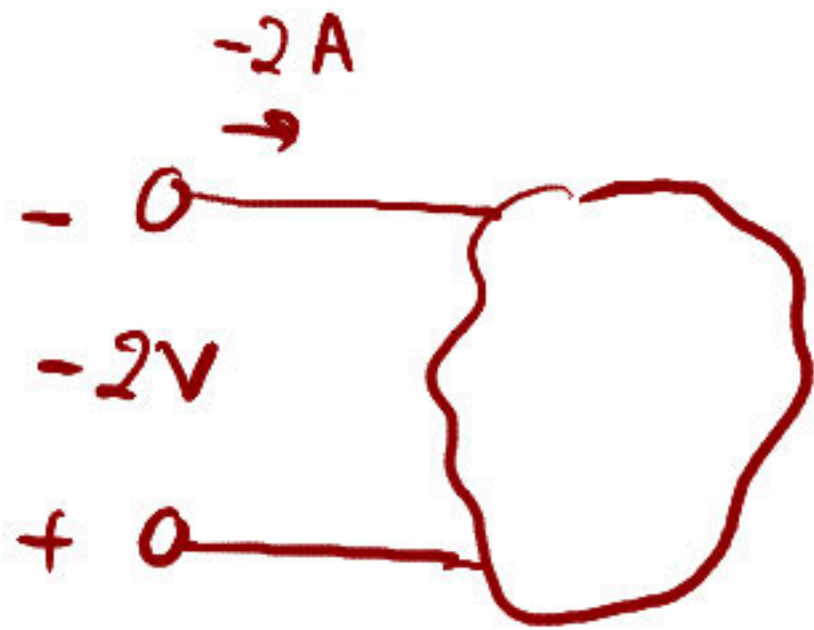
($\sum v = 0$)

KVL $-12 + v_8 + v_7 + 4v_x - v_x = 0$ — ① ✓

$$v_8 = 8i, v_7 = 7i, v_x = -30i \quad \text{代入①}$$

$$\therefore -12 + 8i + 7i + 4(-30i) + 30i = 0 \quad \text{--- ②}$$

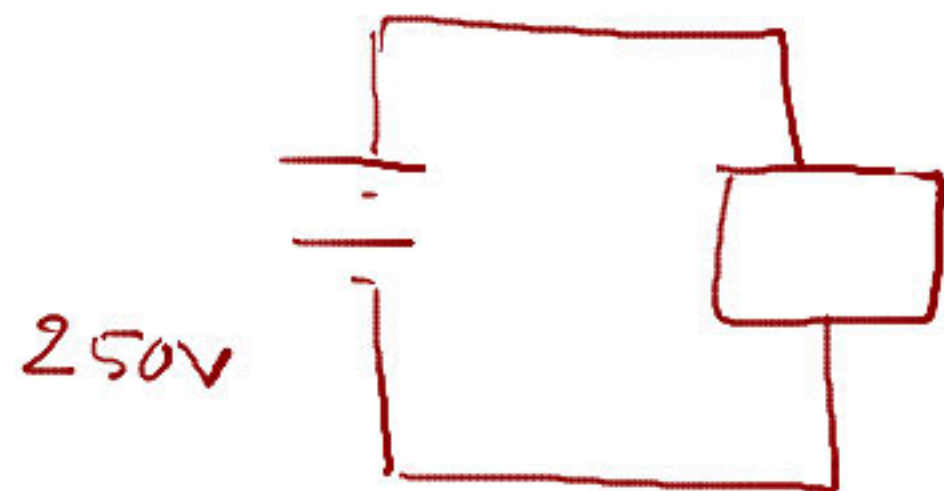
$-120 + 45$



$$\begin{aligned} P &= (-2V)(-2A) \\ &= 4W \text{ (sử dụng)} \end{aligned}$$

3.

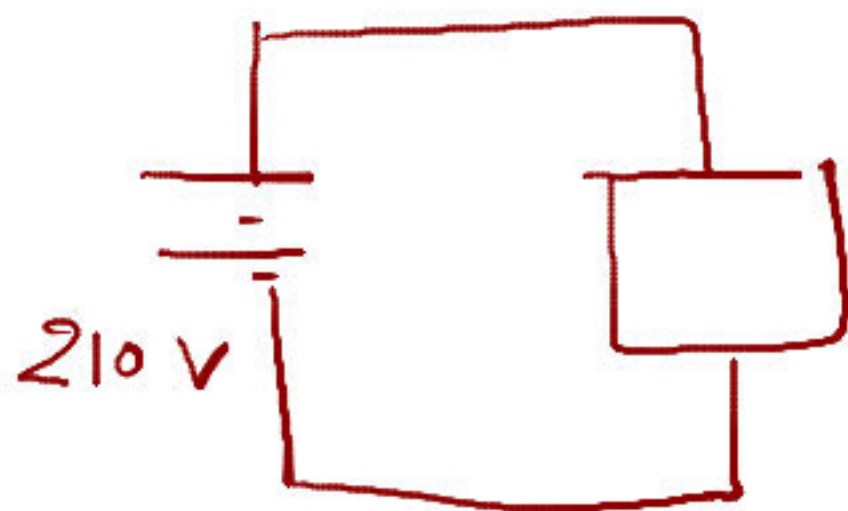
$$\frac{V}{IR}$$



$$R = ? \Omega$$

$$P_h = \underline{1000W} = \frac{V^2}{R} = P$$

$$R = \underline{X} ?$$

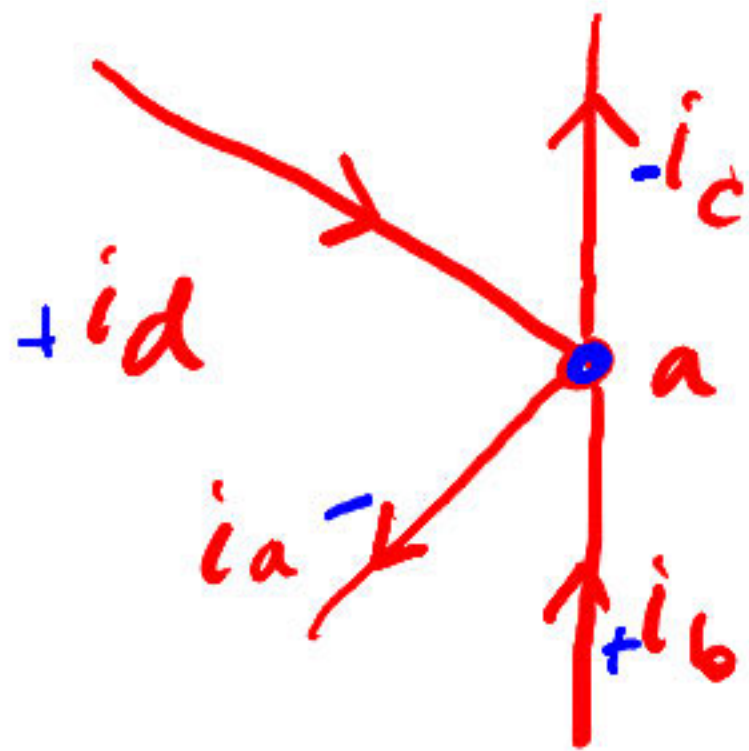


$$P_h = ? W$$

$$R = ? \Omega$$

$$= \frac{V^2}{R} = \frac{210^2}{X}$$

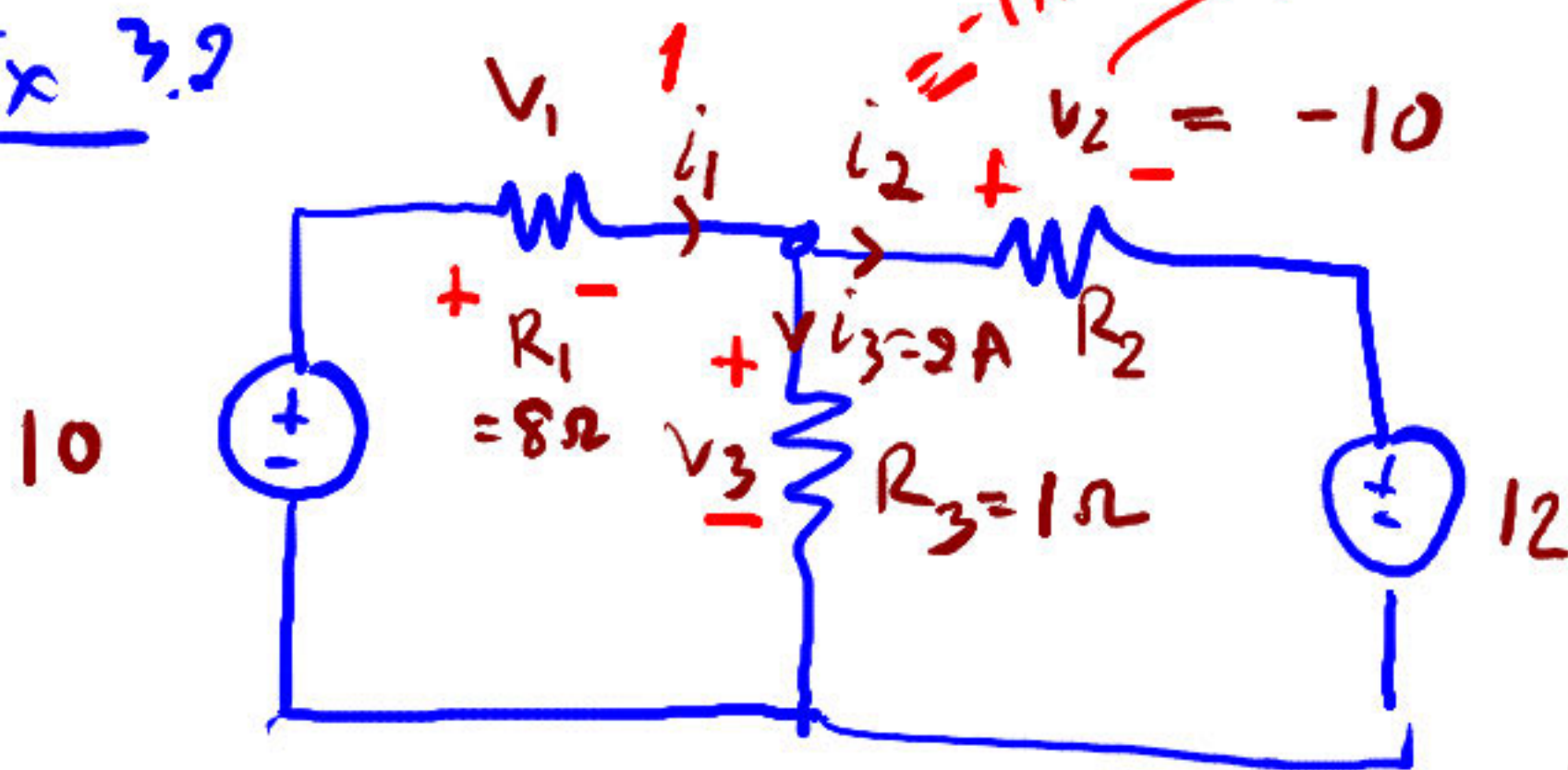
$$= \quad W$$



KCL at Node a

$$\therefore -i_a + i_b - i_c + i_d = 0$$

Ex 3.2



Then R_2 (KVL, KCL)

Solve

$$V_3 = i_3 \cdot R_3 = 2A \times 1\Omega = 2V$$

$$i_2 = ? \text{ via } i_1$$

via i_1

Loop #1

$$-10 + V_1 + V_3 = 0$$

$$V_1 = 10 - 2$$

$$= 8V$$

$$\therefore i_1 = V_1 / R_1 = 8 / 8 = 1$$

KCL

$$i_1 = i_2 + i_3 = 1$$

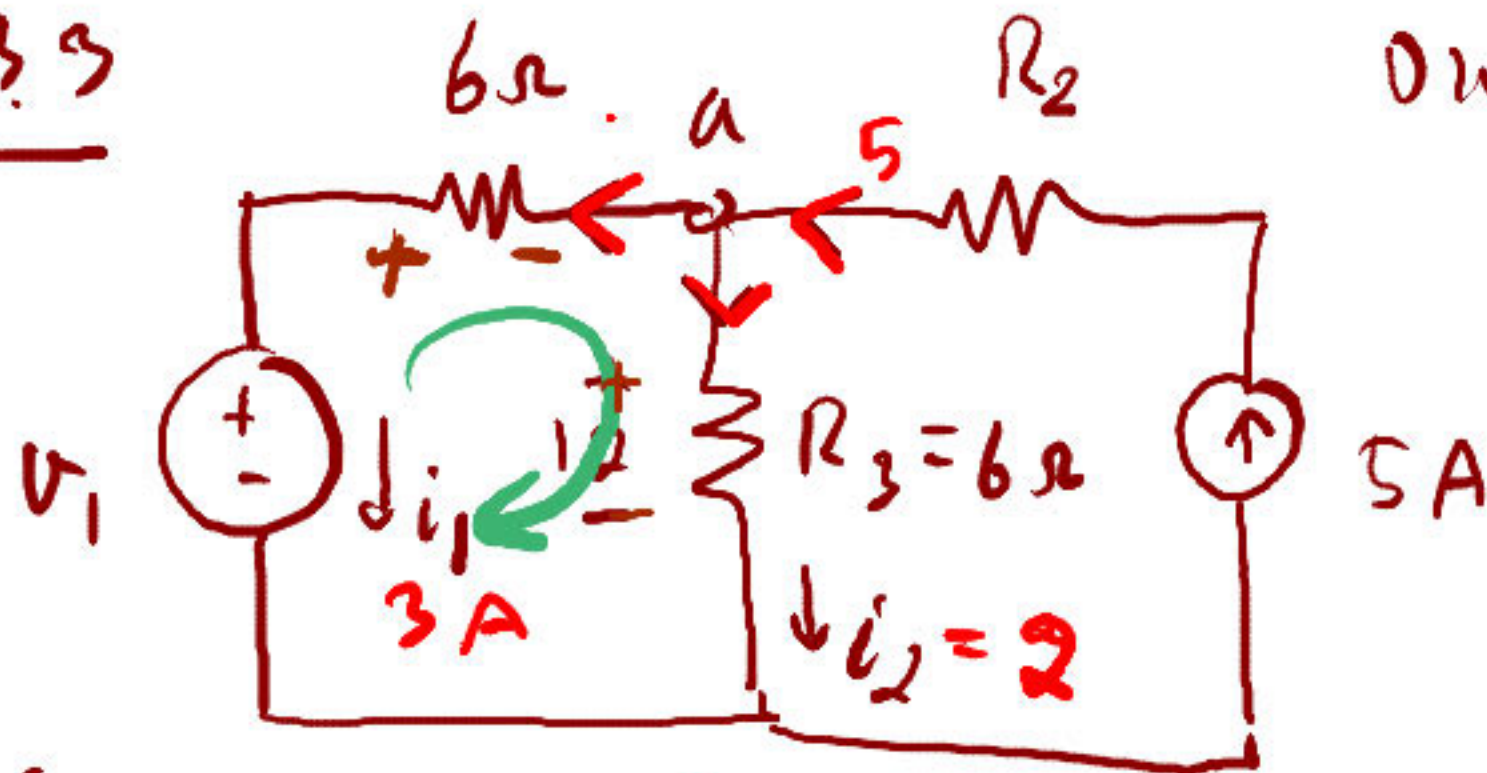
$$= i_2 + 2A$$

$$\therefore i_2 = i_1 - i_3$$

$$= 1 - 2$$

$$\therefore -1A$$

Ex 3.3



Orn i_1 na v_1

KVL #1 ໂຕຈຳລັກ

$$-v_1 - 6i_1 + 12 = 0 \quad (2)$$

$$\text{ນັ້ນ } i_1 = 3A \quad (2)$$

$$-v_1 - 6(3) + 12 = 0$$

$$v_1 = -18 + 12 = -6V$$

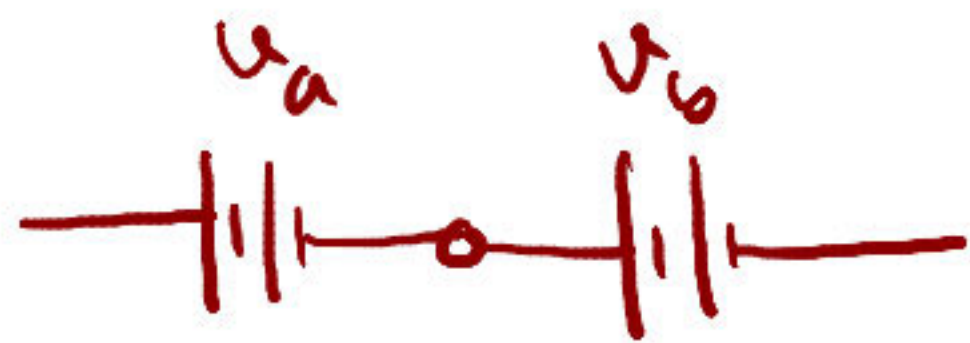
ວິທີ 1 KCL ທີ່ ນຸ່ມ a ໂຕຈຳລັກ

$$5A = i_1 + i_2 \Rightarrow 5A - i_1 - i_2 = 0 \quad (1)$$

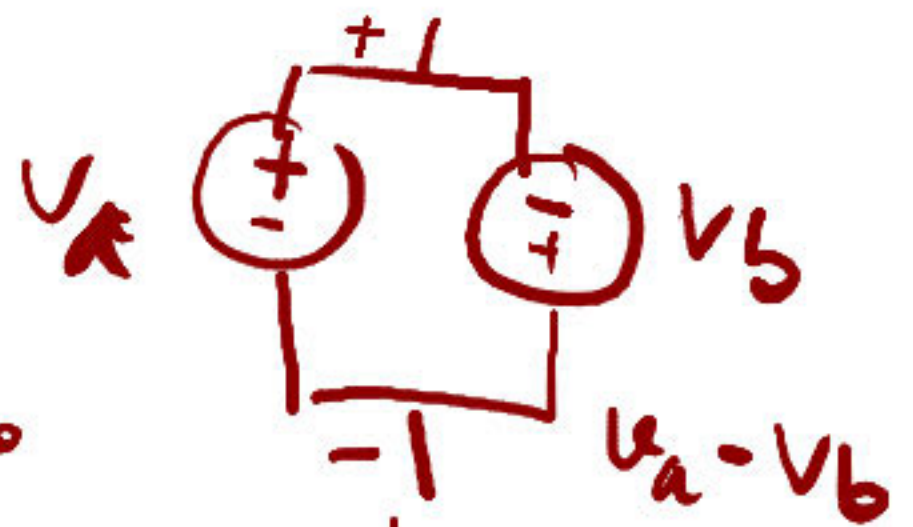
$$\therefore i_2 = \frac{12V}{6\Omega} = 2A$$

$$\therefore \text{ນັ້ນ } i_2 \text{ ໃນ } (1) \text{ ຈຶ່ງໄດ້ } 5A - i_1 - 2A = 0$$

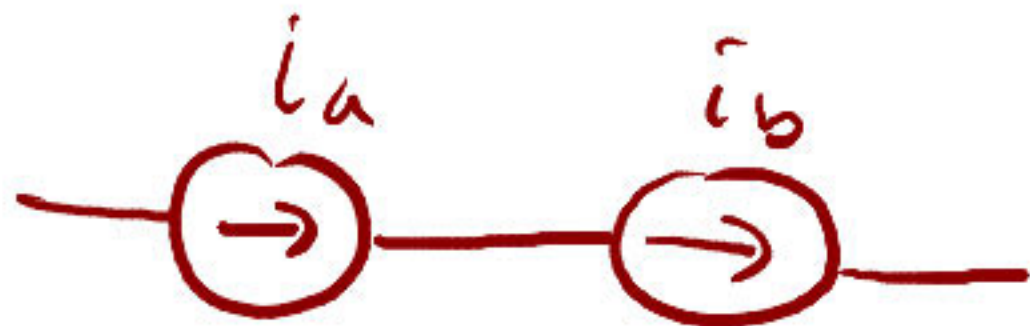
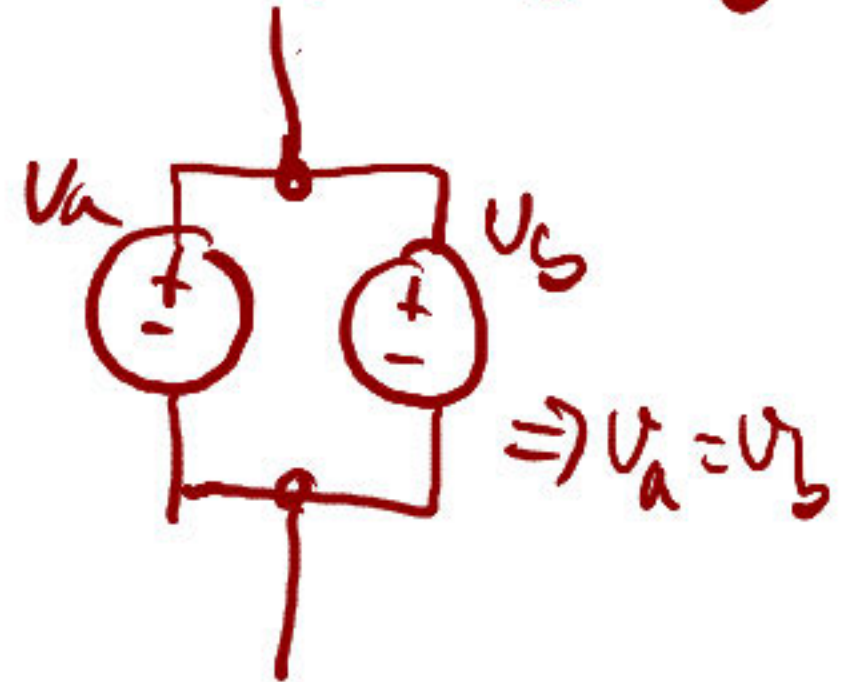
$$i_1 = 5 - 2 = 3A$$



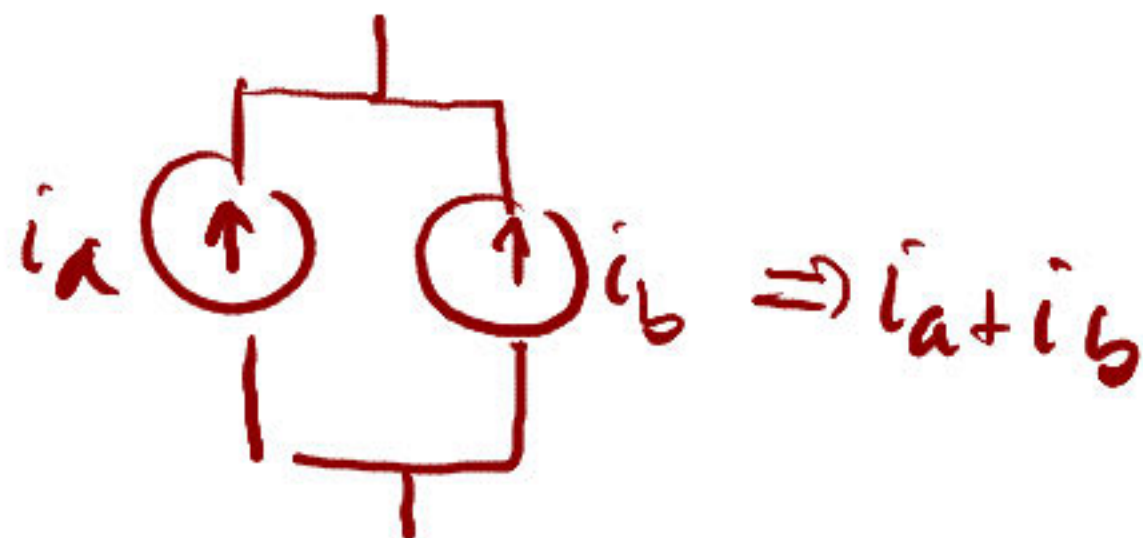
$$\Rightarrow u_a + u_b$$



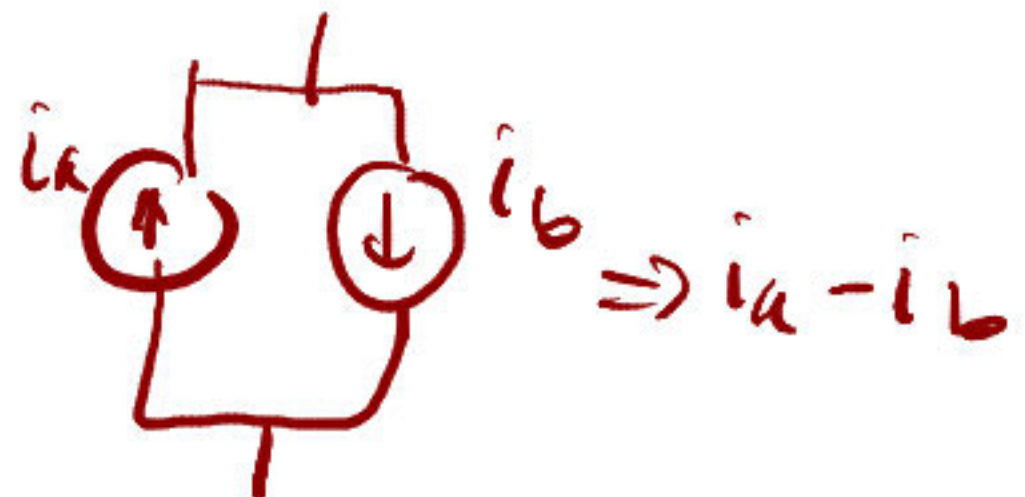
$$\Rightarrow u_a - u_b$$



$$\Rightarrow i_a = i_b$$

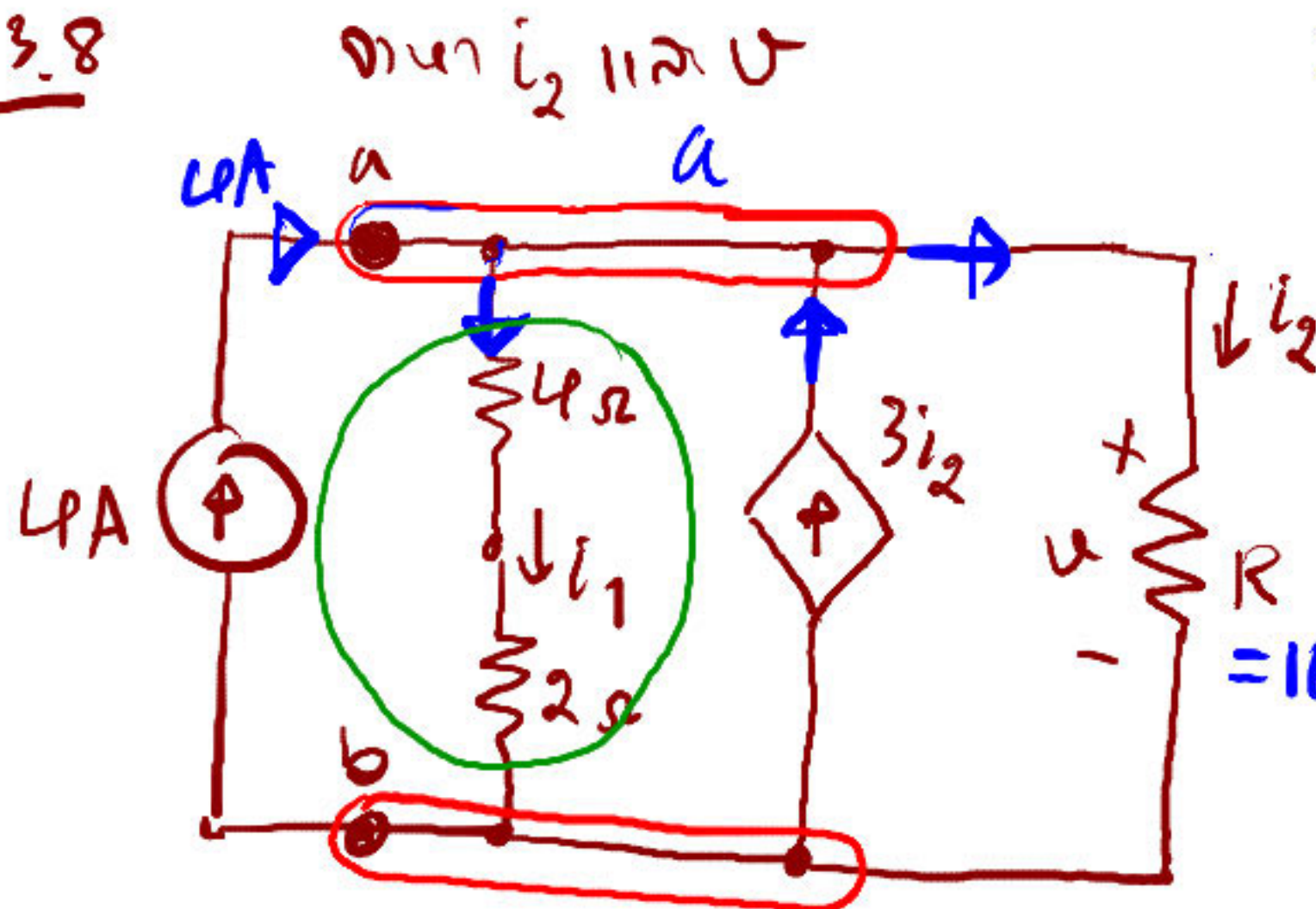


$$\Rightarrow i_a + i_b$$



$$\Rightarrow i_a - i_b$$

Ex 3.8



วิธีทำ KCL ที่ node a

$$+4A + 3i_2 - i_1 - i_2 = 0$$

— ①

Ohm's Law

$$i_1 = \frac{v}{R} = \frac{v}{4+2} = \frac{v}{6}$$

$$i_2 = \frac{v}{R} = \frac{v}{16}$$

หาค่า i_1 และ i_2 ใน ①

$$4 + 3\left(\frac{v}{16}\right) - \frac{v}{6} - \frac{v}{16} = 0$$

$$4 + 2\frac{v}{16} - \frac{v}{6} = 0$$

$$\frac{2v}{16} - \frac{v}{6} = -4$$

$$\frac{v}{8} - \frac{v}{6} = -4 \quad (\text{คูณ 24})$$

$$\frac{3v}{4} - \frac{4v}{6} = -8$$

$$\frac{V}{4} - \frac{V}{3} = -8$$

$$\frac{3V - 4V}{12} = -8$$

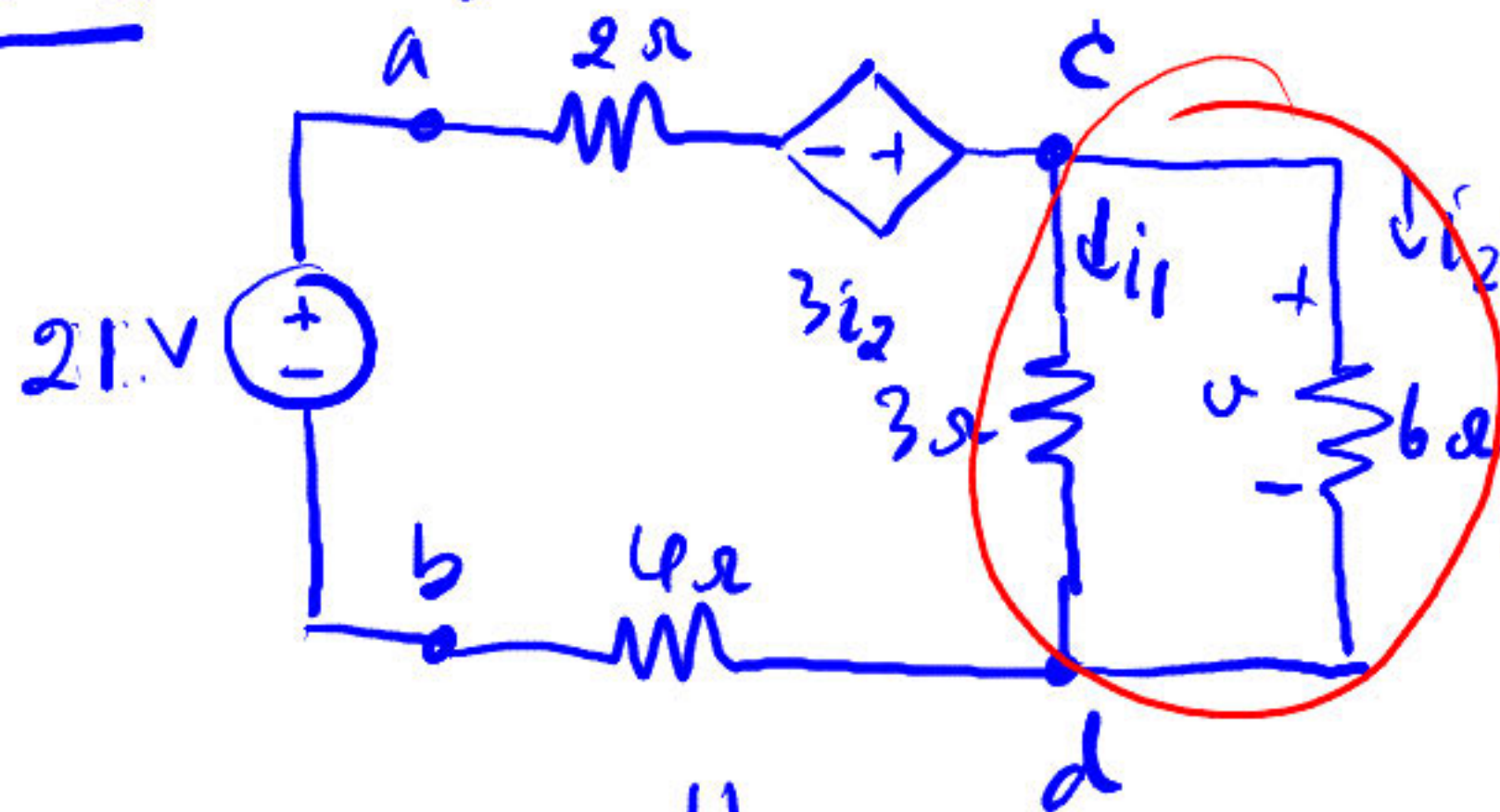
- $\frac{V}{12} = -8$

$$V = 12 \times 8$$

$$= 96 \text{ Volt}$$

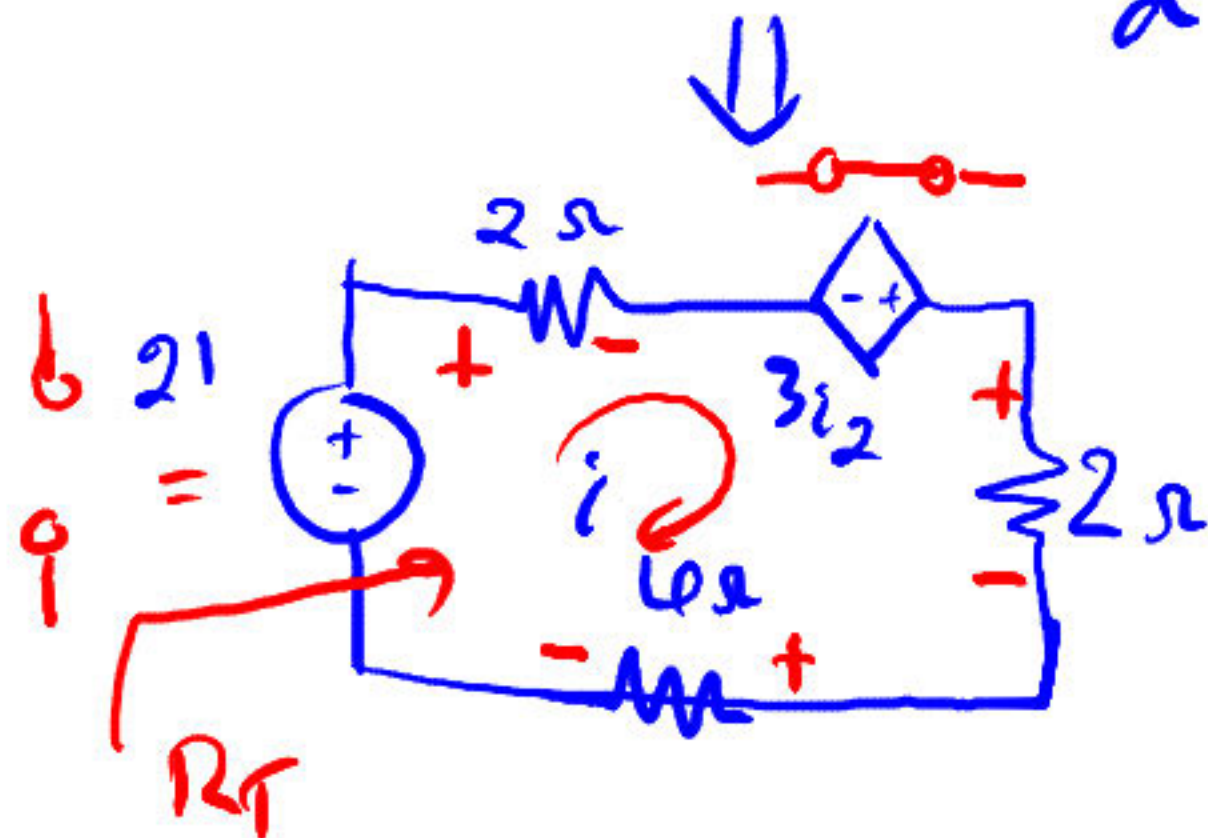
$$\text{In } i_2 = \frac{V}{R} = \frac{96}{16} = 6 \text{ A}$$

Ex 3.9 Find i_2 in 10V



1. $i_2 = \frac{V}{R}$
1. $i_2 = \frac{10}{6}$

$$\rightarrow \frac{3 \times 6}{3+6} = \frac{18}{9} = 2\Omega$$



2. Find R_T (open circuit voltage)

$$R_T = 2 + 2 + 4 = 8$$

(Short circuit voltage)

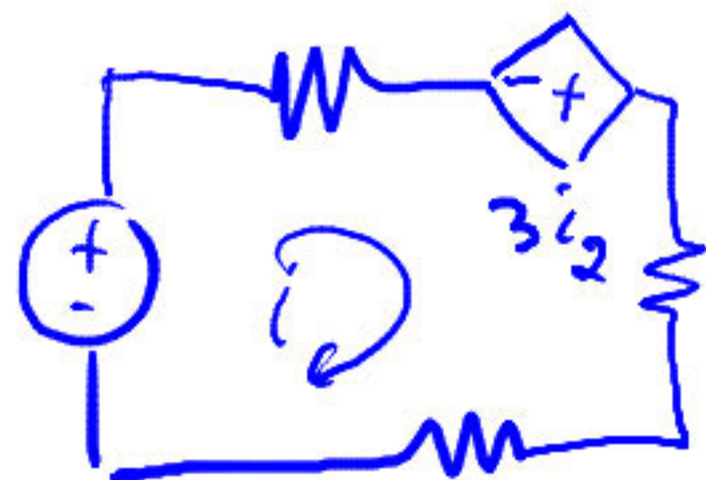
3. KVL loop

$$-21 + 2i - 3i_2 + 2i + 4i = 0$$

$$-21 + 8i - 3i_2 = 0 \quad \text{--- (1)}$$

$$4. \text{ 11m4 } i_2 = \frac{v}{6} \text{ 27 14 } \textcircled{1}$$

$$-21 + 8i - 3i_2 = 0$$



$$15 - 21 + 8i - 3\left(\frac{v}{6}\right) = 0 \text{ - } \textcircled{2} \quad \boxed{i = 3i_2} \text{ (04V22)}$$

$$\text{11m4 } i \text{ 04V } 3i_2 \text{ 14 } \textcircled{2}$$

$$-21 + 8\left(3\frac{v}{6}\right) - 3\left(\frac{v}{6}\right) = 0$$

$$-21 + (4v) - \frac{v}{2} = 0$$

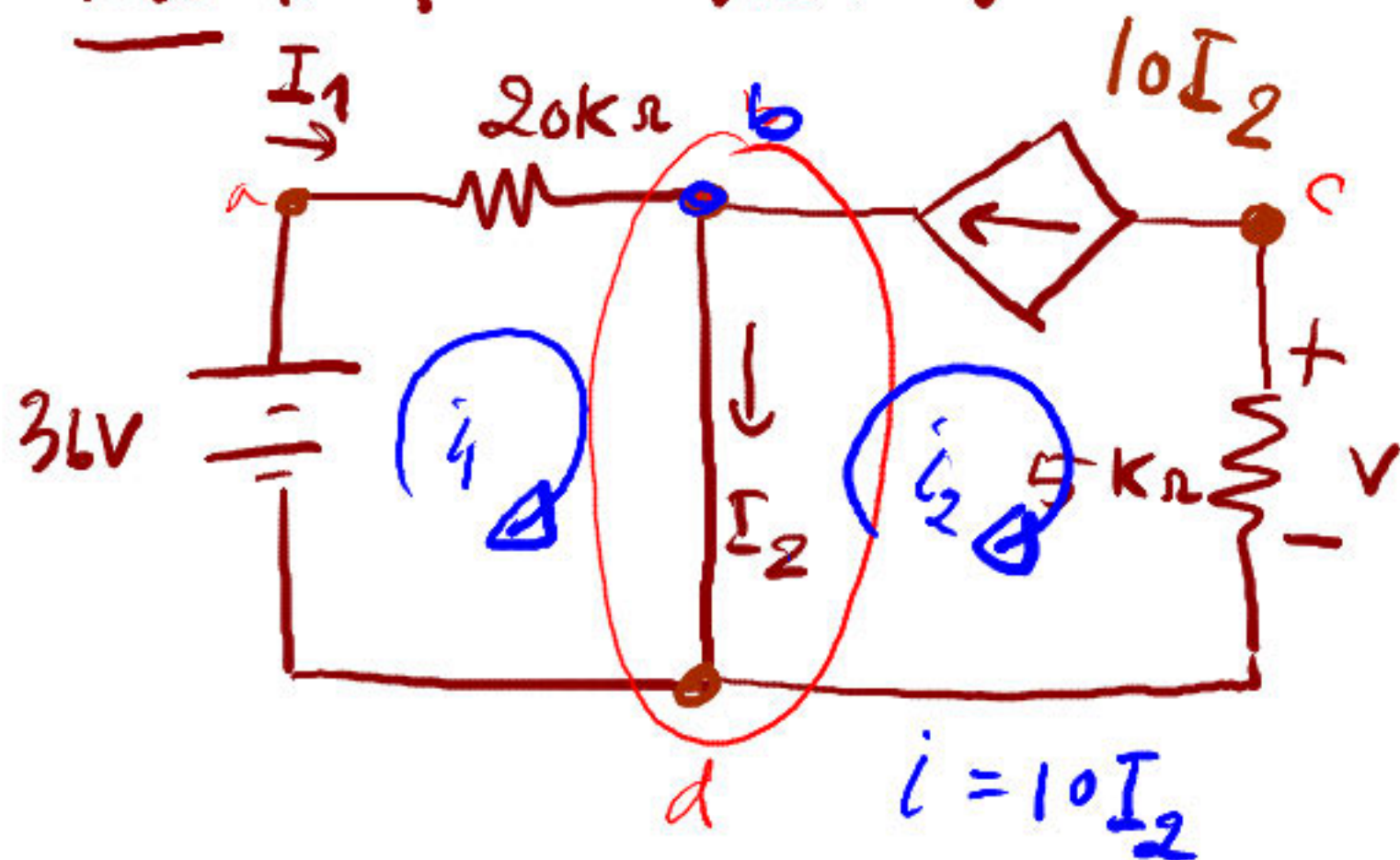
$$\begin{aligned} \text{11m4 } i_2 &= \frac{v}{6} \\ &= \frac{6}{6} = 1A \end{aligned}$$

$$\text{2 04V222222} \quad -42 + 8v - v = 0$$

$$7v = 42 \Rightarrow v = 6V$$

Test # 4

given V



! $R_T =$

When $V = \text{open}$
 $I = \text{Short}$

I_1

from b

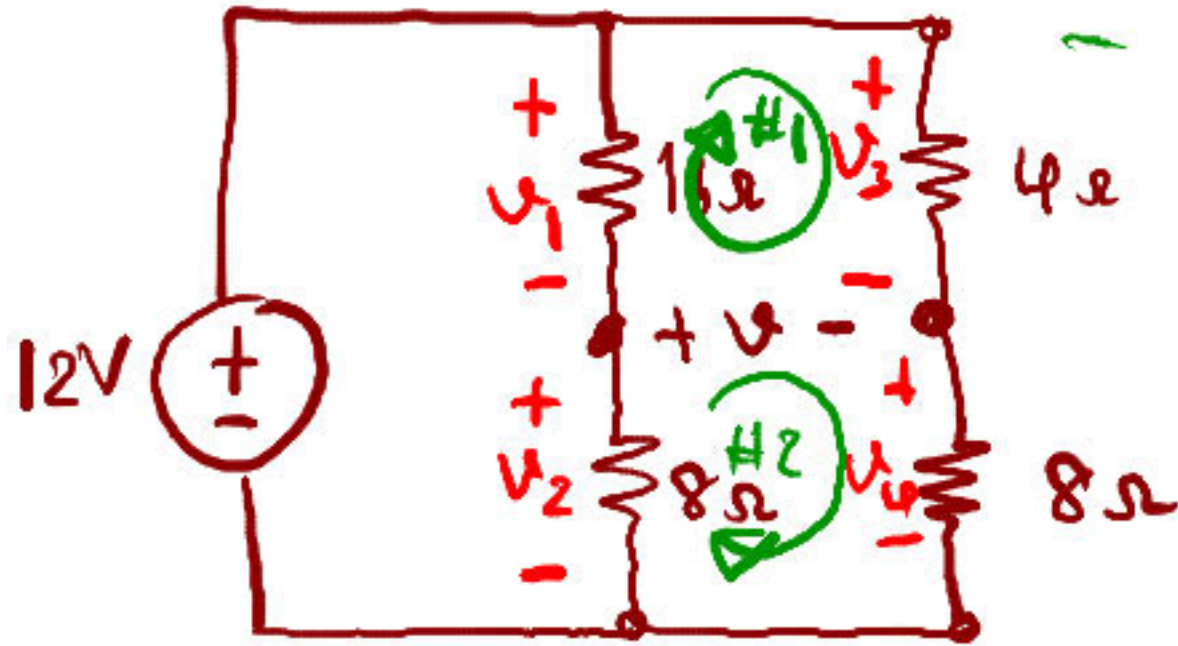
2. KCL $I_1 + 10I_2 - I_2 = 0$

$I_2 =$

3. Ohm $V = I R$

Ans 4 #3

4.



Voltage Division.

$$v_1 = \frac{16\Omega \times 12V}{16\Omega + 8\Omega} = 8V$$

$$v_3 = \frac{4\Omega \times 12}{4\Omega + 8\Omega} = 4V$$

Also

$$v_2 = 4V$$

$$v_4 = 8V$$

$\therefore$ KVL #2

$$+v + v_4 - v_2 = 0$$

$$v = v_4 + v_2 = -4V.$$

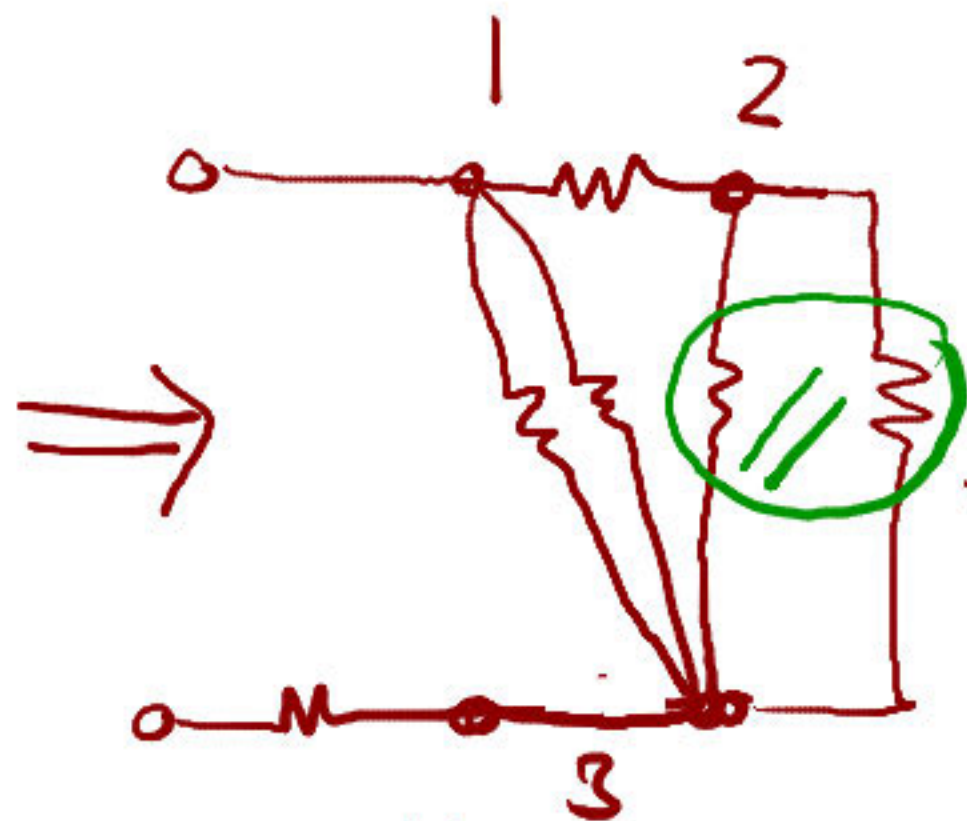
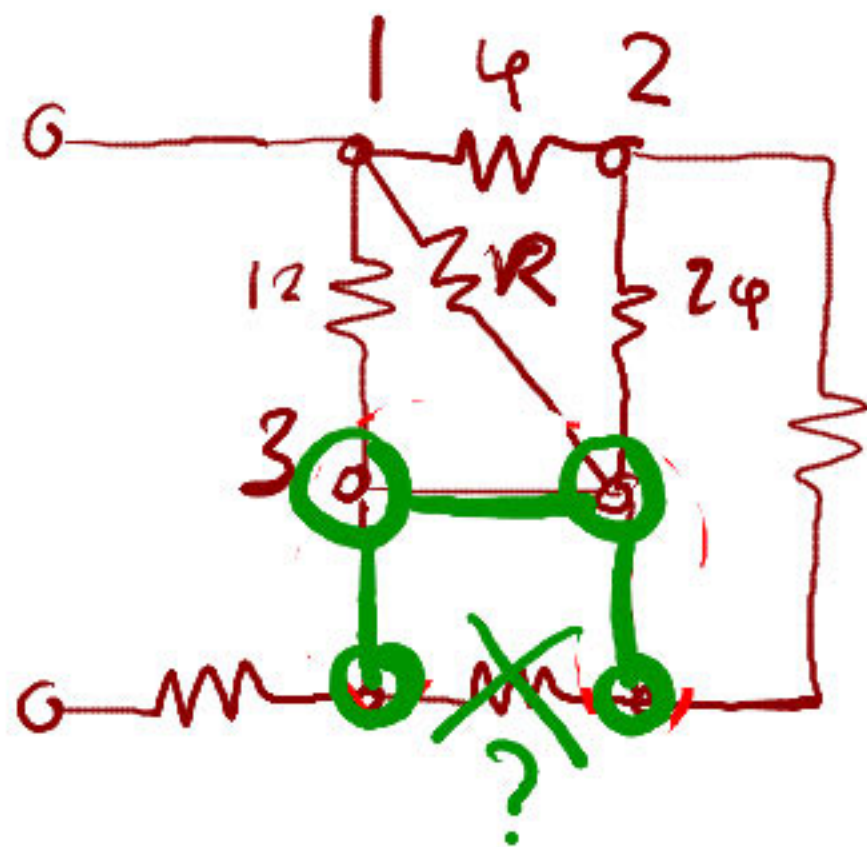
KVL; Loop #1

$$+v_3 - v - v_1 = 0$$

$$-v = v_1 - v_3$$

$$v = -v_1 + v_3 = -4V$$

7.



$$(12 \parallel 24 \parallel 10) + 5 = \frac{1}{R_{eq}}$$

