

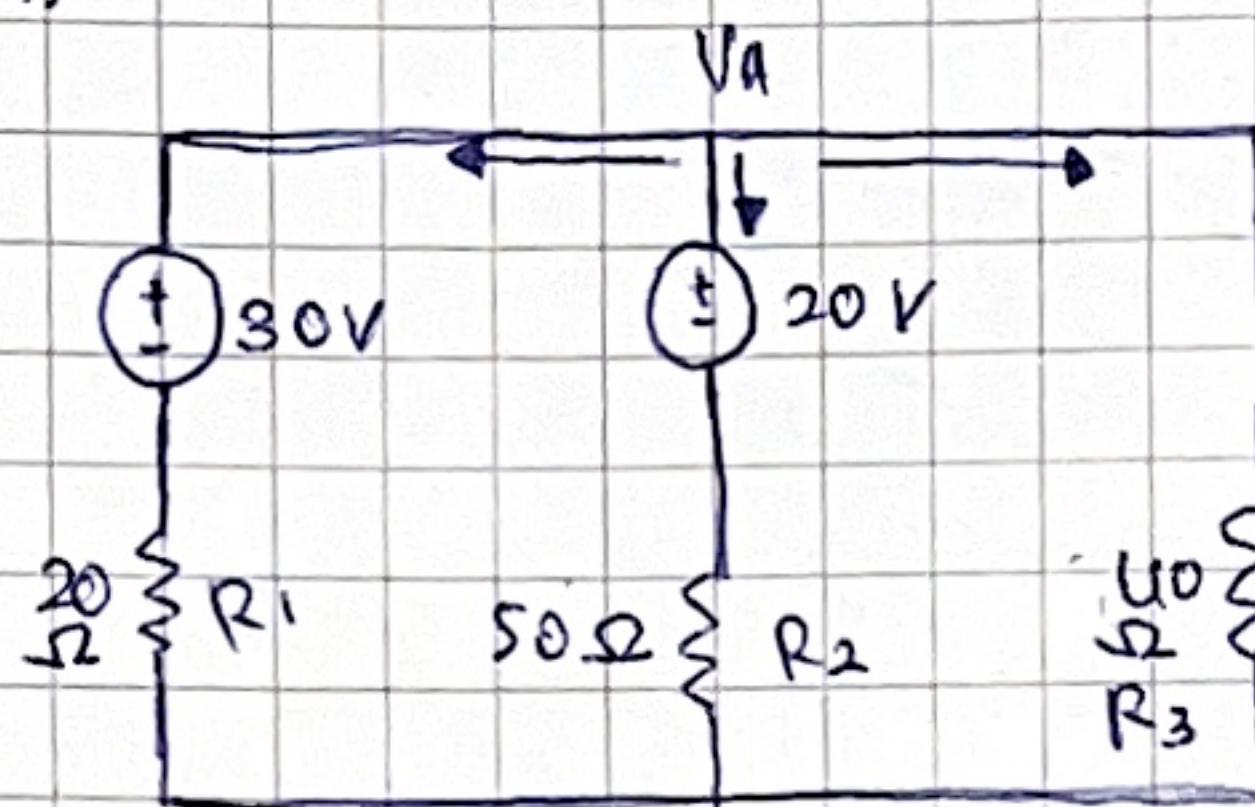


Mata Kuliah:.

Tgl:.

Hal: /

3.)



mencari I_3 :

$$I_3 = \frac{V_A}{R_3} \rightarrow I_3 = \frac{20}{40} = 0,5 \text{ A}$$

$$\Sigma I = 0$$

$$I_1 + I_2 + I_3 = 0$$

$$\rightarrow \frac{V_A - 30}{20} + \frac{V_A - 20}{50} + \frac{V_A}{40} = 0$$

$$\rightarrow 10V_A - 300 + 4V_A - 80 + 5V_A = 0$$

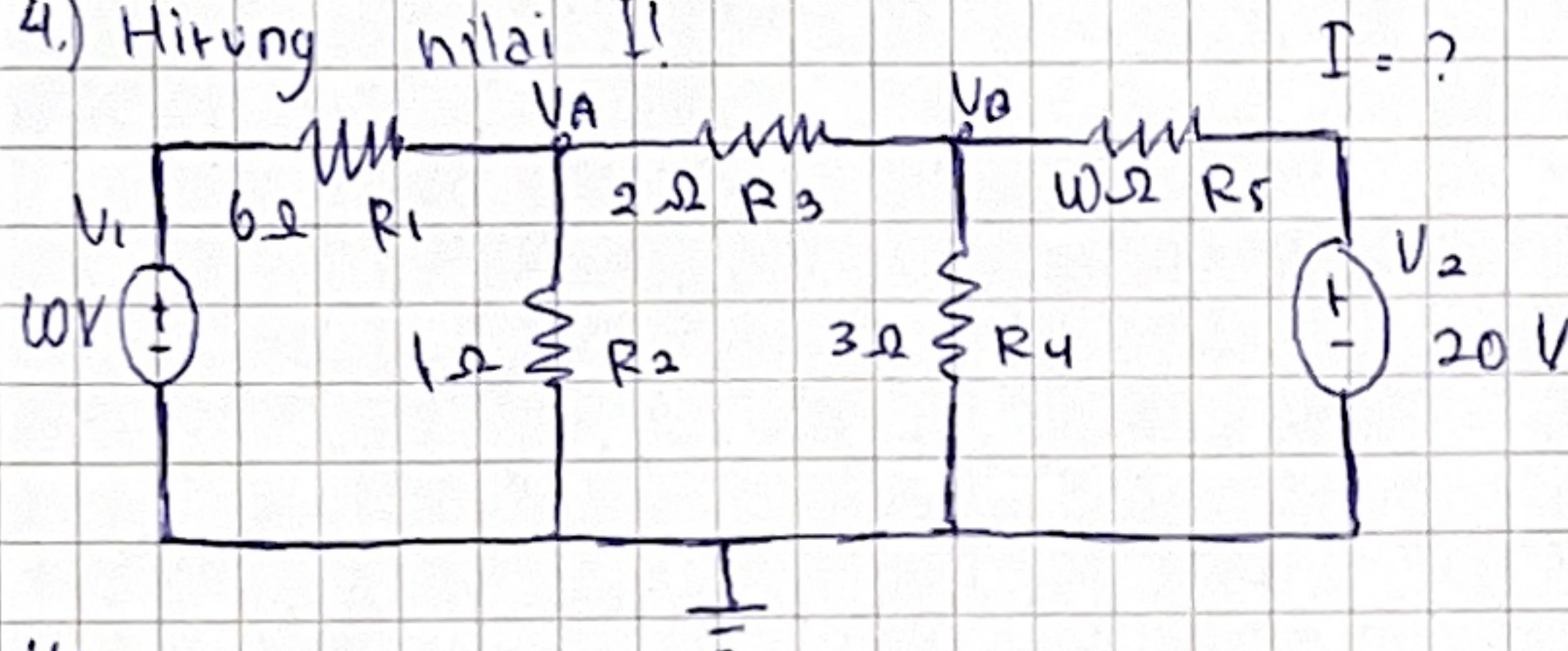
$$\rightarrow 19V_A - 380 = 0$$

$$\rightarrow 19V_A = 380$$

$$V_A = \frac{380}{19} = 20 \text{ V}$$

maka: $V_0 = I_3 \cdot R_3$
 $V_0 = 0,5 \cdot 40$
 $V_0 = 20$
 $V_0 = -20$
 (Berlawanan)

4.) Hitung nilai I !



V_B :

$$\Sigma I = 0$$

$$\rightarrow \frac{V_B - 20}{10} + \frac{V_B}{3} + \frac{V_B - V_A}{2} = 0$$

$$\rightarrow 3V_B - 60 + 10V_B + 15V_B - 15V_A = 0$$

$$\rightarrow 28V_B - 15V_A - 60 = 0$$

$$\rightarrow 28V_B - 15V_A = 60 \dots (2)$$

Eliminasi (1) dan (2)

$$\begin{array}{l} 10V_A - 3V_B = 10 \quad \times 3 \\ 28V_B - 15V_A = 60 \quad \times 2 \end{array}$$

$$30V_A - 9V_B = 30$$

$$-36V_A + 56V_B = 120$$

$$47V_B = 150$$

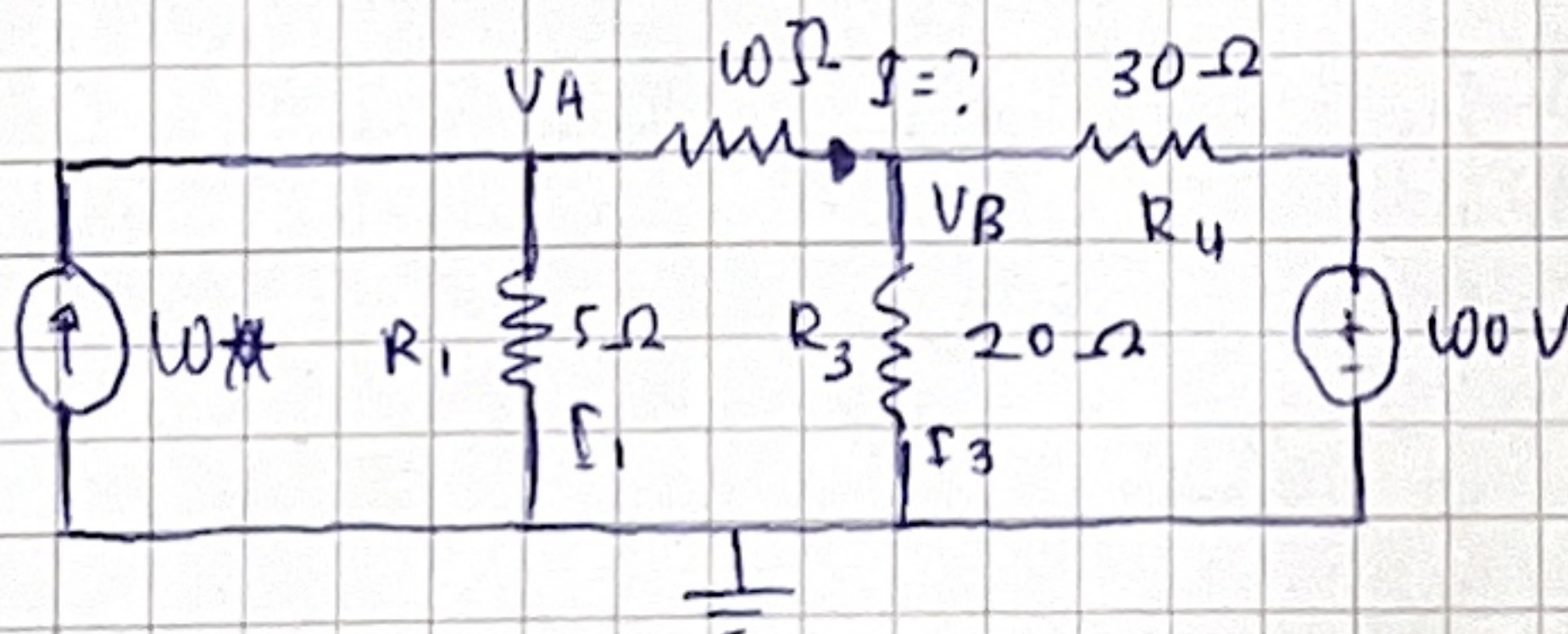
$$V_B = \frac{150}{47}$$

$$V_B = 3,19$$

$$V_B \approx 3,2 \text{ A}$$

nilai I
 $I = I_5 = \frac{V_B - 20}{R_5}$
 $= \frac{3,2 - 20}{10}$
 $= -1,68 \text{ A}$

5.)



V_B :

$$\Sigma I = 0$$

$$\rightarrow \frac{V_B - 100}{30} + \frac{V_B}{20} + \frac{V_B - V_A}{10} = 0$$

$$\rightarrow 2V_B - 200 + 3V_B + 6V_B - 6V_A = 0$$

$$\rightarrow 11V_B - 6V_A = 200 = 0$$

$$\rightarrow 11V_B - 6V_A = 200 \dots (2)$$

V_A :

$$\Sigma I = 0$$

$$\rightarrow \frac{V_A - V_B}{10} + \frac{V_A}{5} + (-10 \text{ A}) = 0$$

$$\rightarrow \frac{V_A - V_B}{10} + \frac{V_A}{5} - 10 = 0$$

$$\rightarrow \frac{V_A - V_B + 2V_A}{10} = 0$$

$$\rightarrow 3V_A - V_B = 100 \dots (1)$$

Eliminasi (1) dan (2)

$$\begin{array}{l} 3V_A - V_B = 100 \quad \times 2 \\ -6V_A + 11V_B = 200 \quad \times 1 \end{array}$$

$$6V_A - 2V_B = 200$$

$$-6V_A + 11V_B = 200 +$$

$$9V_B = 400$$

$$V_B = \frac{400}{9}$$

$$V_B = 44,4 \text{ V}$$



Mata Kuliah.:

Tgl.:

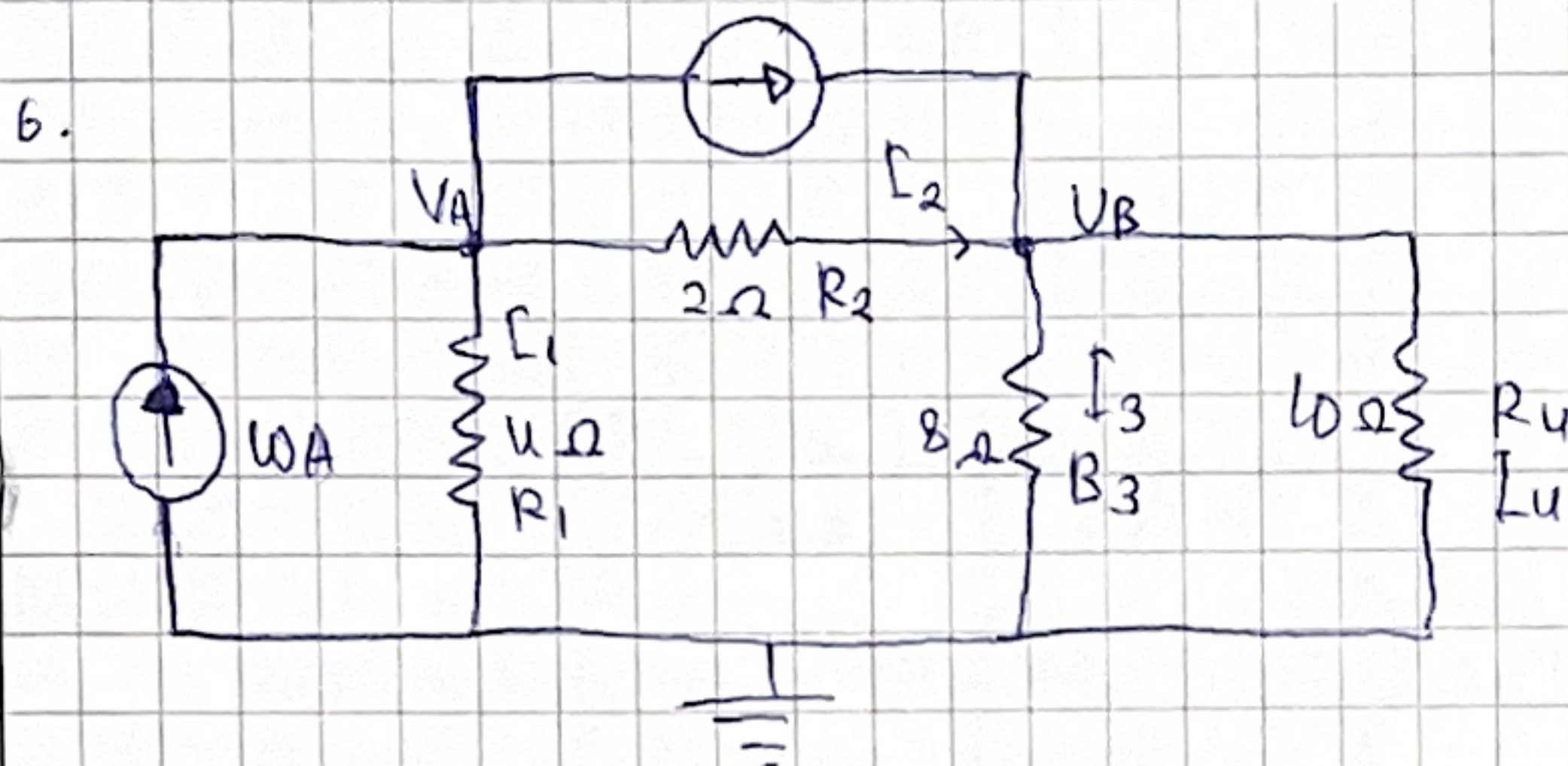
Hal. : /

5.) mencari nilai V_A (substitusi)

$$\begin{aligned} 0) 3V_A - V_B &= 100 \\ 0) 3V_A - 100 &= 100 \\ 0) 3V_A &= 100 + 100 \\ 0) 3V_A &= 200 \\ 0) V_A &= \frac{200}{3} = 66,67 \text{ V} \end{aligned}$$

maka nilai I :

$$\begin{aligned} I = I_2 &= \frac{V_A - V_B}{R_2} \\ &= \frac{66,67 - 100}{10} \\ &= \frac{-33,33}{10} = -3,33 \text{ A} \approx -0,33 \text{ A} \end{aligned}$$



$$\begin{aligned} V_A &= \\ \Sigma I &= 0 \\ -10 + \frac{V_A}{4} + 5 + \frac{V_A - V_B}{2} &= 0 \\ \frac{V_A}{4} - \frac{V_B}{2} + \frac{V_A}{2} - 5 &= 0 \\ \frac{2V_A - 2V_B + 2V_A}{4} - 5 &= 0 \\ 3V_A - 2V_B &= 20 \quad (1) \end{aligned}$$

$$\begin{aligned} V_B &= \\ \Sigma I &= 0 \end{aligned}$$

$$\begin{aligned} \frac{V_B}{10} + \frac{V_B}{8} + \frac{V_B - V_A}{2} - 5 &= 0 \\ \frac{V_B + 2V_B + 4V_B - 40}{16} &= 5 \\ 11V_B - 40 &= 80 \quad (2) \end{aligned}$$

Eliminasi (1) dan (2)

$$\begin{aligned} 3V_A - 2V_B &= 20 \quad | \times 8 \\ -24V_A + 16V_B &= 160 \quad | \times 3 \\ 24V_A - 16V_B &= 160 \\ -24V_A + 33V_B &= 240 + 160 \\ 17V_B &= 400 \\ V_B &= \frac{400}{17} \\ V_B &= 23,52 \end{aligned}$$

Substitusi mencari V_A

$$\begin{aligned} 3V_A - 2(V_B) &= 20 \\ 3V_A - 2(23,52) &= 20 \\ 3V_A - 47,04 &= 20 \\ 3V_A &= 20 + 47,04 \\ 3V_A &= 67,04 \\ V_A &= \frac{67,04}{3} \\ V_A &= 22,34 \end{aligned}$$

mencari nilai I

$$\begin{aligned} I = I_2 &= \frac{V_A - V_B}{R_2} \\ &= \frac{22,34 - 23,52}{2} \\ &= \frac{-1,18}{2} \\ &= -0,59 \text{ A} \approx -0,6 \text{ A} \end{aligned}$$