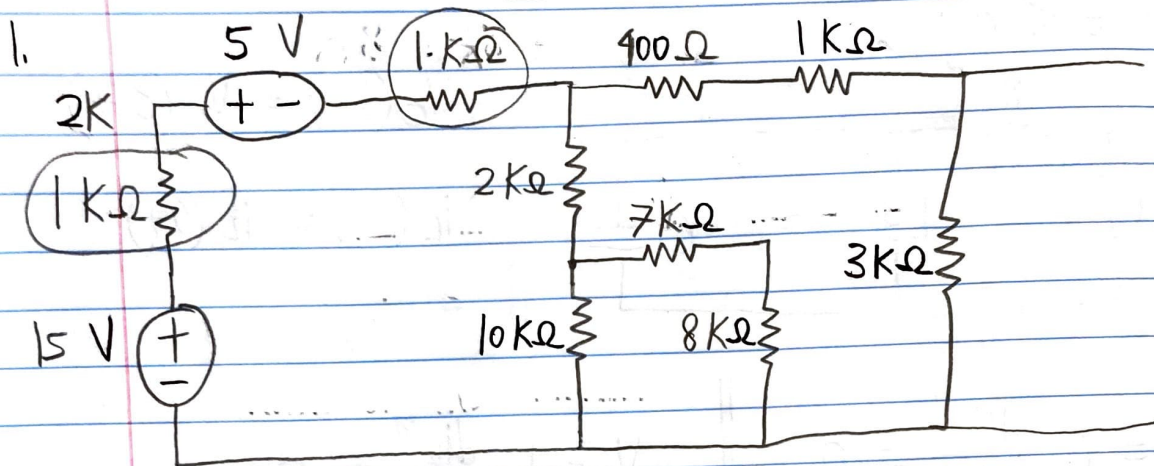


Name: Mulia Widjaja (Noble)

HomeWork #1

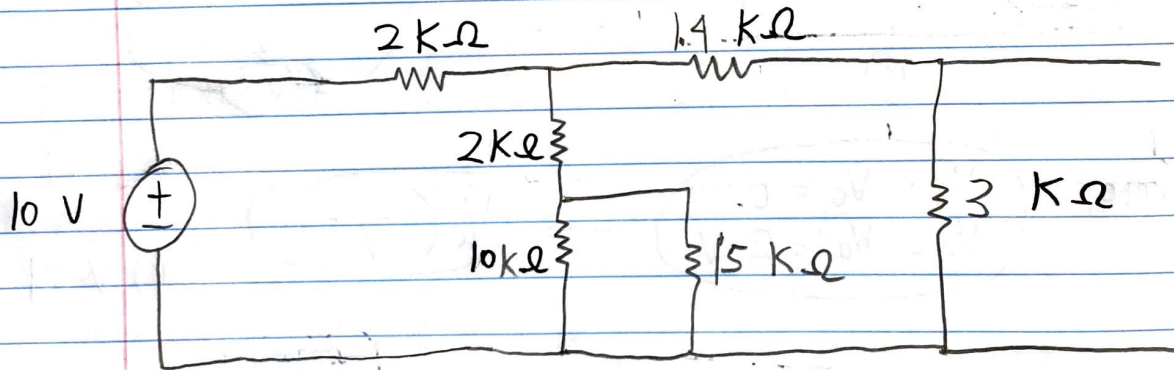


$$1 + 1 = 2$$

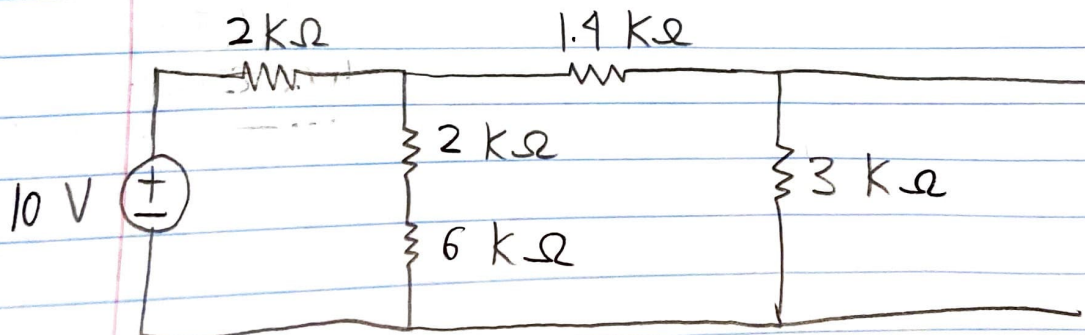
$$15V - 5V = 10V$$

$$0.4 + 1 = 1.4$$

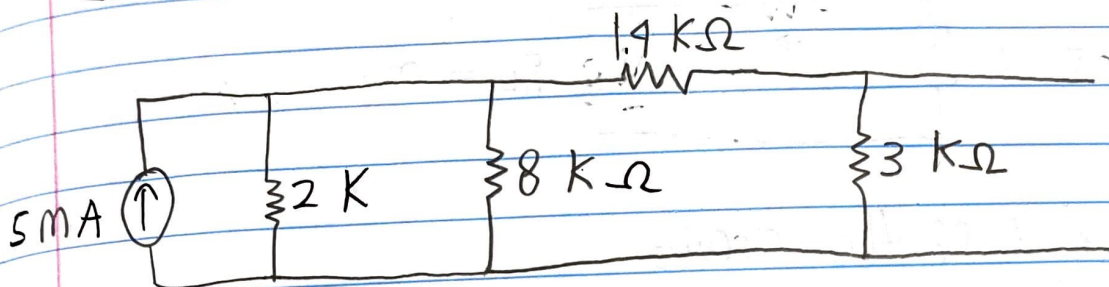
$$7 + 8 = 15$$



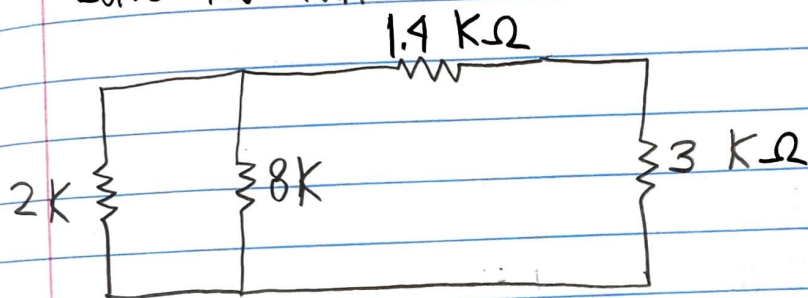
$$\frac{(10)(15)}{10+15} = \frac{150}{25} = 6$$



$$\frac{10}{2000} = 5 \text{ mA} \quad || \quad 2\text{K} + 6\text{K} = 8\text{K}$$

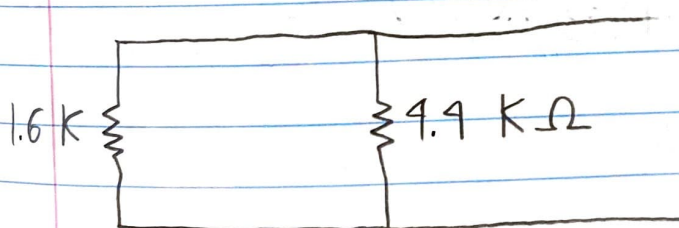


Solve for R_{th} :



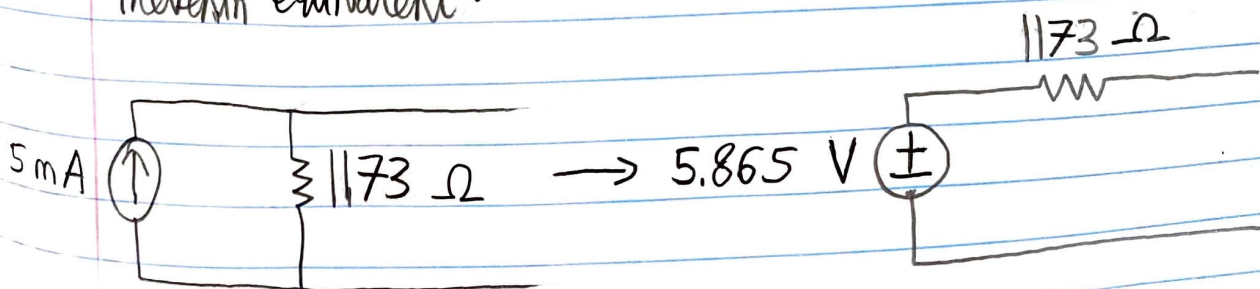
$$1.4 + 3 = 4.4$$

$$\frac{(2)(8)}{2+8} = \frac{16}{10} = 1.6$$

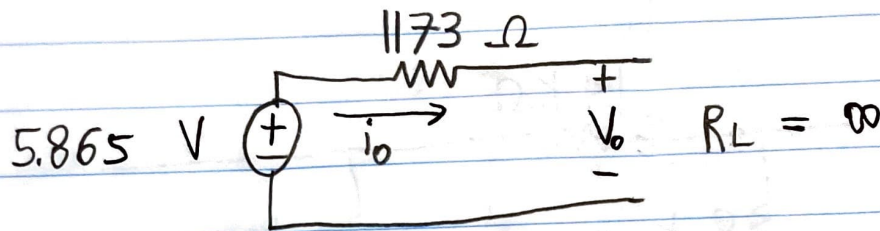


$$R_{th} = \frac{(1.6)(4.4)}{1.6+4.4} = 1.173$$

Thevenin equivalent:



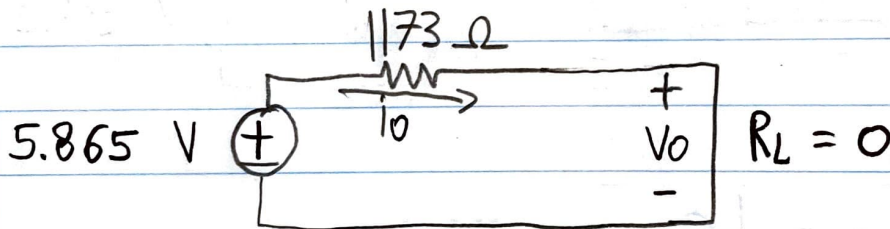
i. Open circuit load:



$$\begin{aligned} V_o &= \text{Rest of the circuit} \\ &= V_{th} \\ &= 5.865 \text{ V} \end{aligned}$$

$$I_o = 0$$

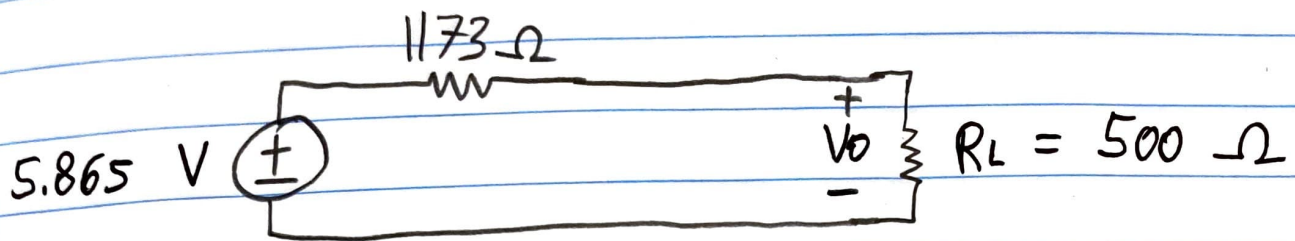
ii. Short circuit load:



$$V_o = \left(\frac{R_L}{R_L + R_{th}} \right) V_{in} = \left(\frac{0}{0 + 1173} \right) (5.865) = 0$$

$$\begin{aligned} I_o &= \text{Rest of the circuit} \\ &= \frac{5.865}{1173} \\ &= 5 \cdot 10^{-3} \text{ A} \\ &= \underline{\underline{5 \text{ mA}}} \end{aligned}$$

iii. $500\ \Omega$ load:



$$\begin{aligned} V_0 &= \left(\frac{R_L}{R_L + R_{th}} \right) V_{in} \\ &= \left(\frac{500}{500 + 1173} \right) (5.865) \\ &= 1.753\text{ V} \end{aligned}$$

$$V_{in} = i (R_{th} + R_L)$$

$$5.865 = i (1173 + 500)$$

$$i = 3.506\text{ mA}$$