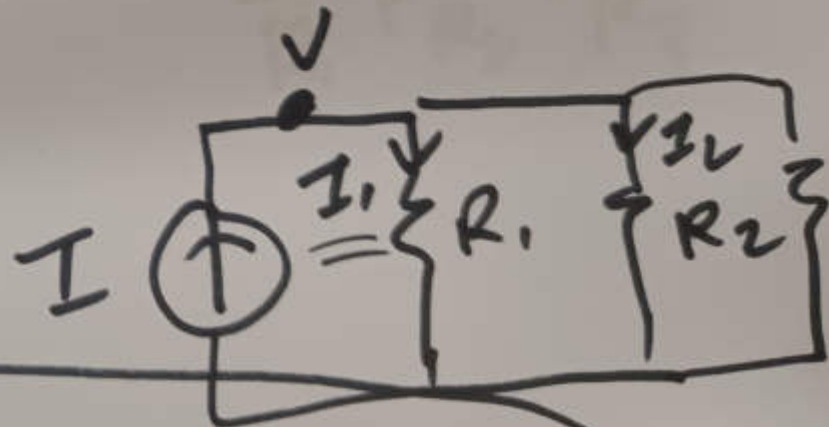
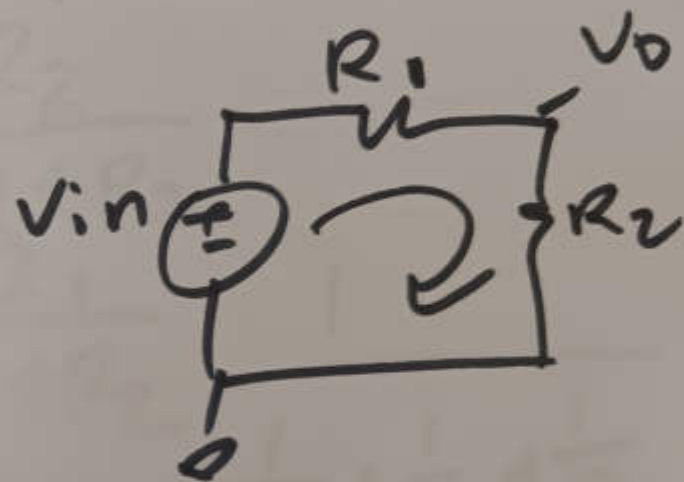


no-load voltage

$$V_0 = V_{in} \cdot \frac{R_2}{R_1 + R_2}$$

$$\frac{V_0}{V_{in}} = \frac{I \cdot R_2}{I \cdot (R_1 + R_2)}$$

$$I_1 = I \cdot \frac{R_2}{R_1 + R_2}$$



$$I \cdot R_{eq} = V = I_1 \cdot R_1 = I_2 \cdot R_2$$

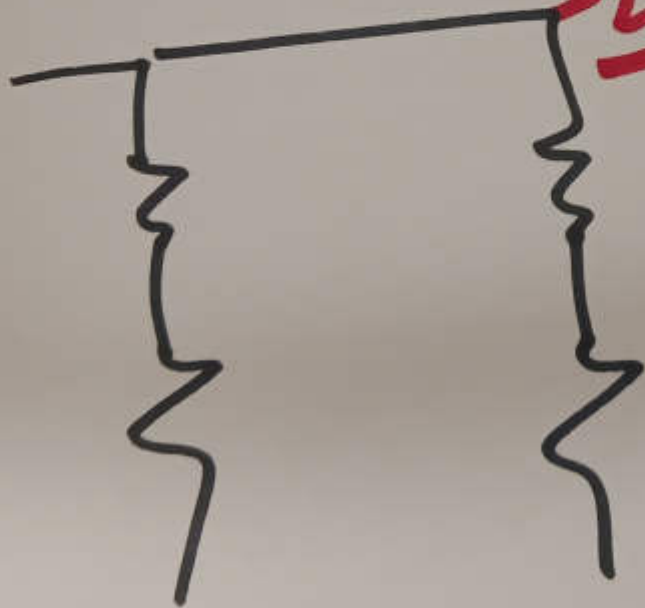
①

$$\underline{R_{eq}} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

$$I \cdot \frac{R_1 \cdot R_2}{R_1 + R_2} = I_1 \cdot R_1$$

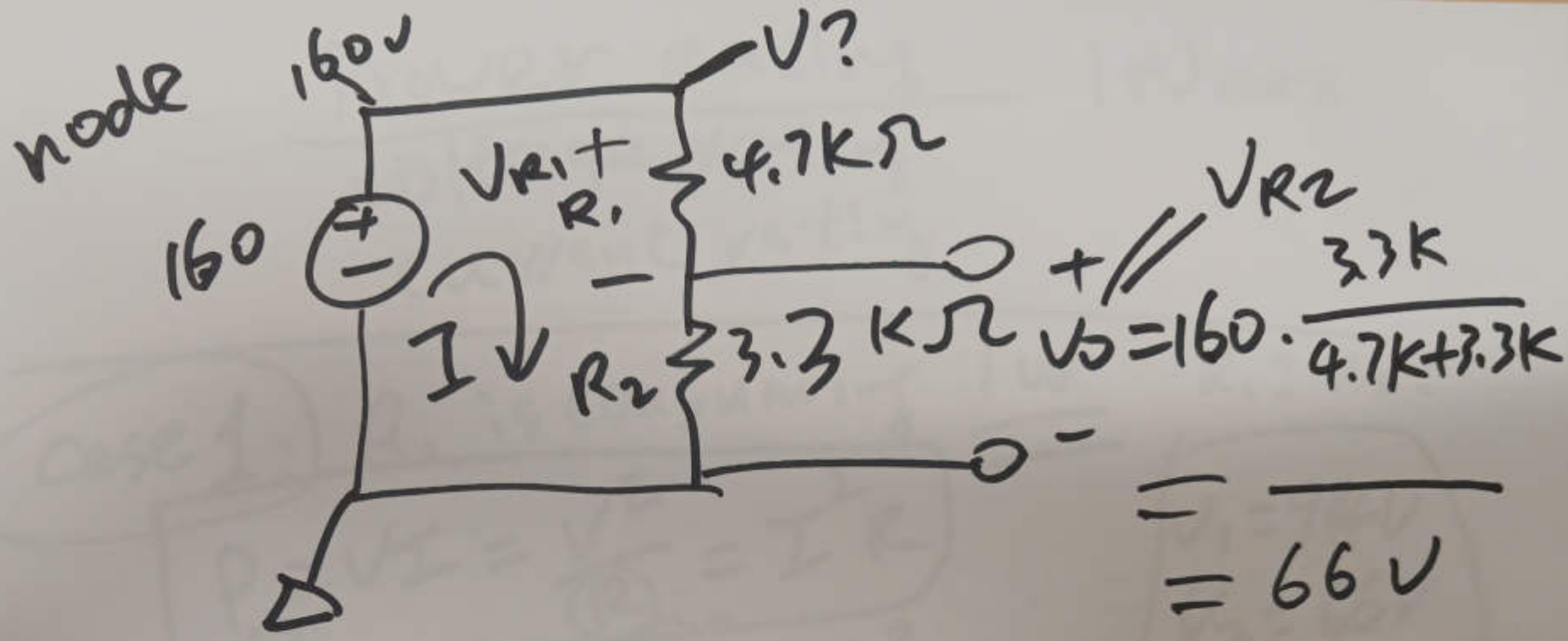
$$I_1 = I \cdot \frac{R_2}{R_1 + R_2}$$

$$I_2 = I \cdot \frac{R_1}{R_1 + R_2}$$



$$\frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

(2)



~~$V_{R1} = 160 \cdot \frac{R_1}{R_1 + R_2}$~~

~~$V = 160 \frac{R_1}{R_1 + R_2}$~~

(3)

Power rating 1W max
voltage rating
current rating

Case 1: R_1 is consuming 1W $R_1 ? R_2 ?$

$$P_{max} = VI = \frac{V^2}{R_{min}} = I^2 R$$

$$V_1 = 94V$$
$$V_2 = 66V$$

$$R_{min} = \frac{V^2}{P} = \frac{94^2}{1W} = 94^2 \Omega = 8.836 k\Omega$$

$$I = \frac{V_1}{R_1} = \frac{94}{94^2} = \frac{1}{94} A$$

$$R_2 = \frac{V_2}{I} = \frac{66V}{1/94} = 66 \cdot 94 = 6.204 k\Omega$$

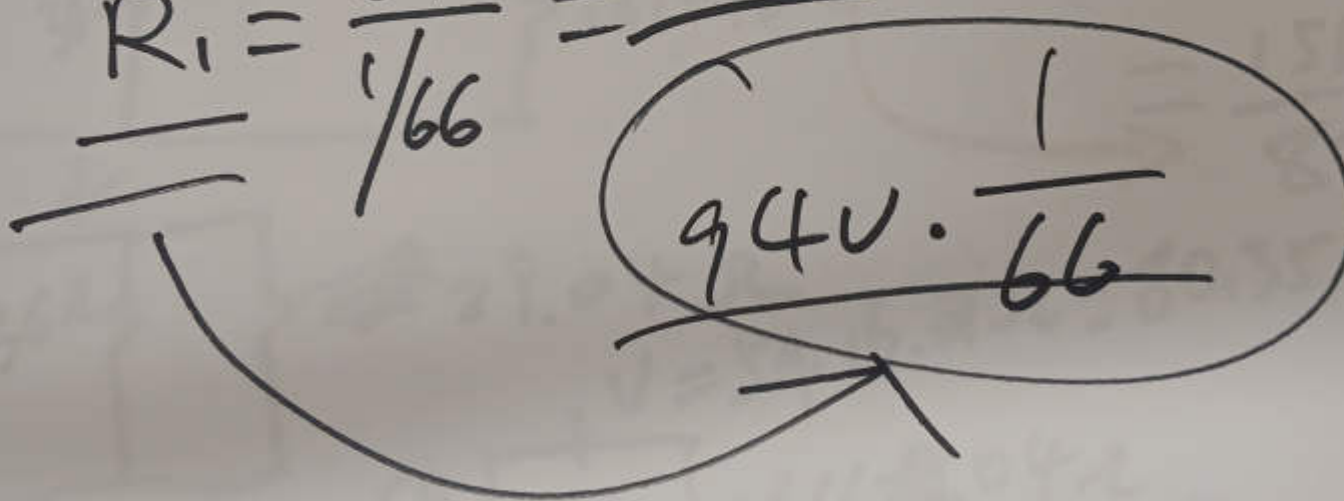
$$66 \cdot \frac{1}{94}$$

④

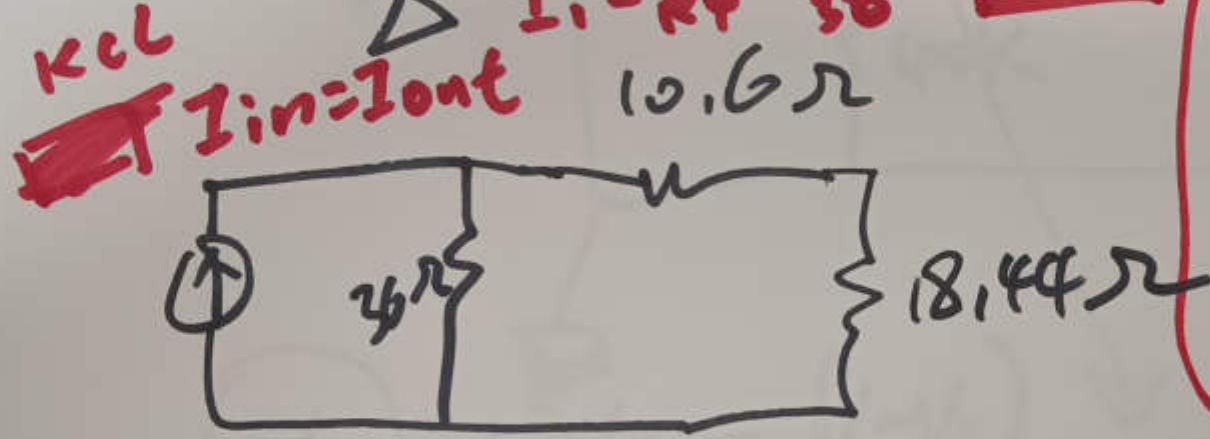
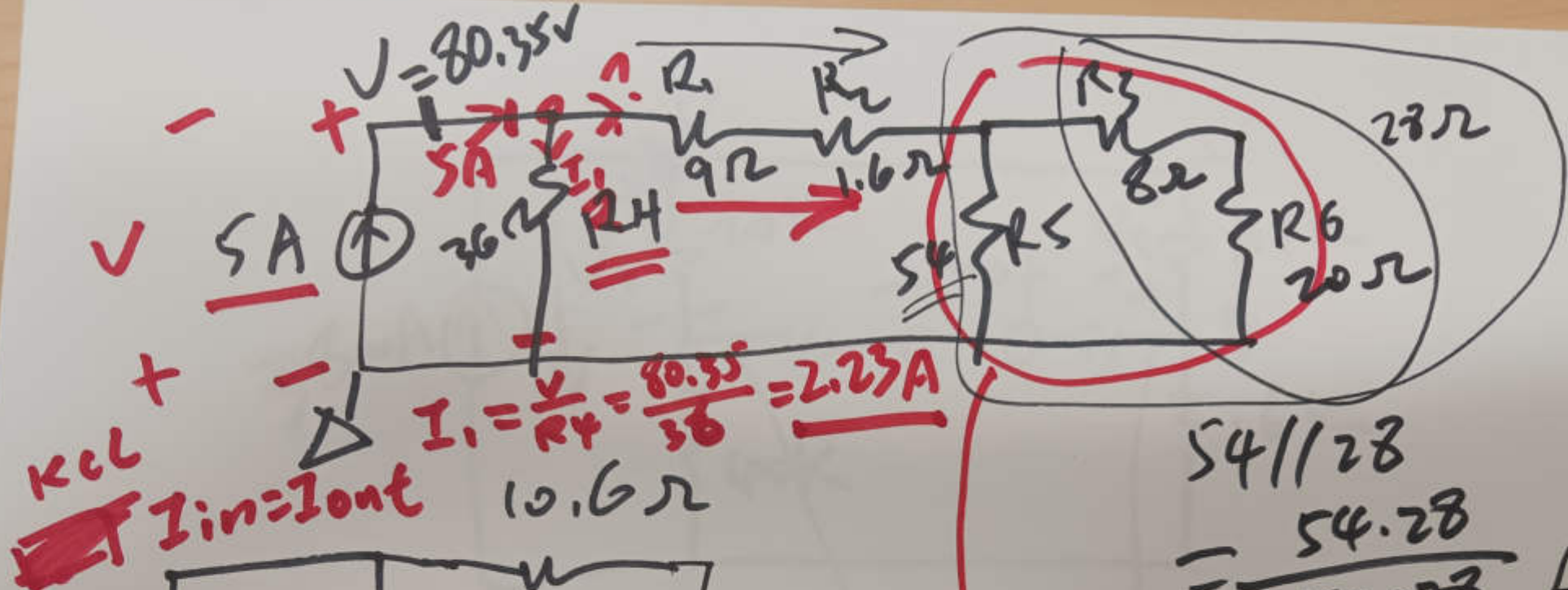
Case 2: If R_2 is consuming 1W

$$R_{2\min} = \frac{V_2^2}{P_{\max}} = \frac{66^2}{1} = 66^2 \Omega = 4.356 \text{ k}\Omega$$

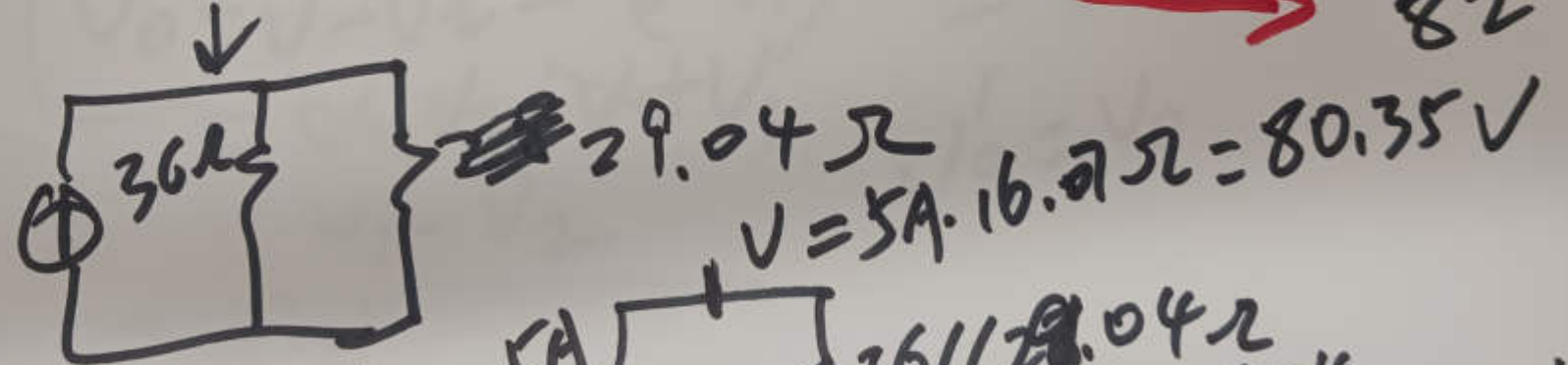
$$I = \frac{V_2}{66^2 \Omega} = \frac{66\text{V}}{66^2 \Omega} = \frac{1}{66} \text{ A}$$

$$R_1 = \frac{V_1}{I} = \frac{94\text{V}}{1/66} = 94\text{V} \cdot 66 = 6.204 \text{ k}\Omega$$


5

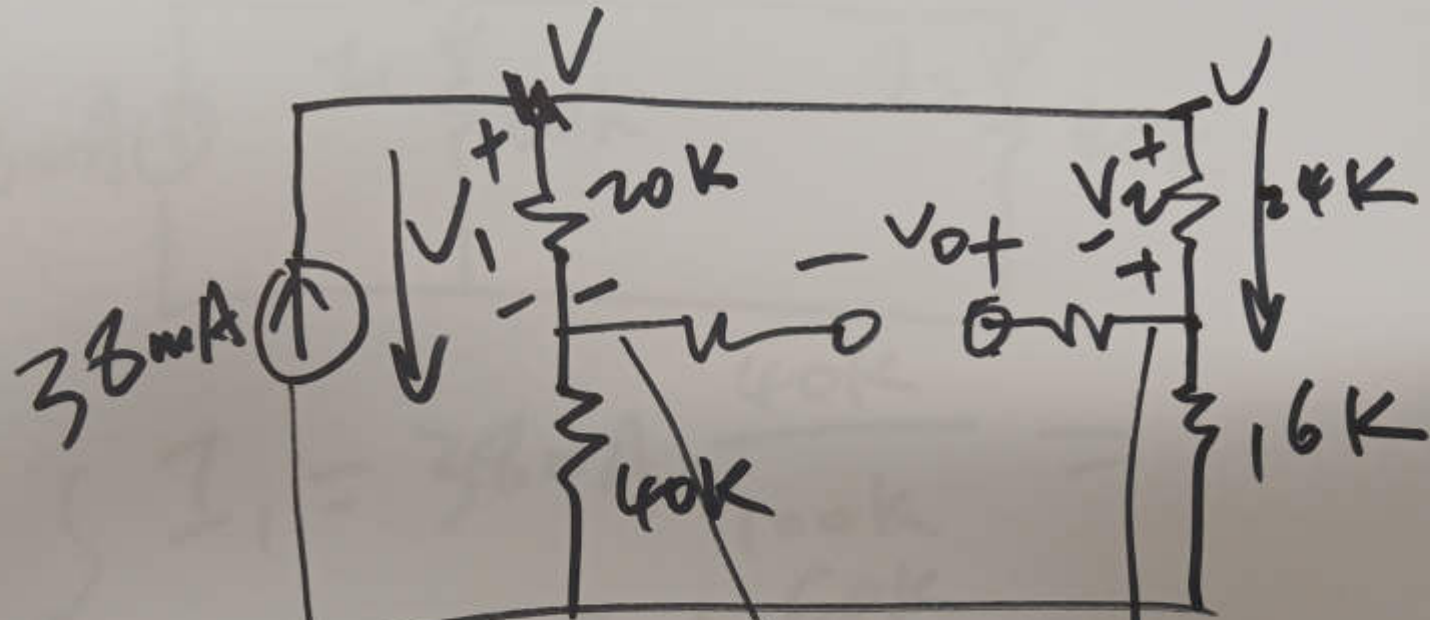


$$\begin{aligned}
 & 54 \parallel 28 \\
 &= \frac{54 \cdot 28}{54 + 28} \\
 &= \frac{1512}{82} = 18.44\Omega
 \end{aligned}$$



$$\begin{aligned}
 & 36 \parallel 29.04\Omega \\
 &= \frac{36 \cdot 29.04}{36 + 29.04} = 16.07\Omega
 \end{aligned}$$

⑥



$$\begin{aligned}
 V_0 &= V - V_2 - (V - V_1) \\
 &= \cancel{V} - V_2 - \cancel{V} + V_1 \\
 &= V_1 - V_2
 \end{aligned}$$

~~$V_0 = V_1 - V_2$~~

$$\begin{aligned}
 V_0' &= V_0
 \end{aligned}$$

①



$$\left\{ \begin{array}{l} I_1 = 38\text{mA} \cdot \frac{40\text{k}}{100\text{k}} = \\ I_2 = 38\text{mA} \cdot \frac{60\text{k}}{100\text{k}} = \end{array} \right.$$