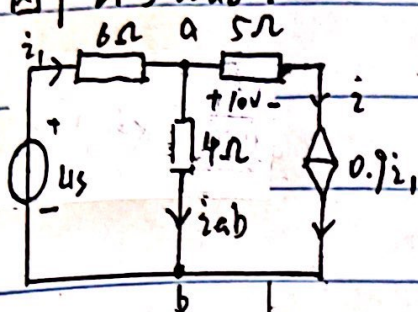


电路与电子技术(-)

1-10: 电路如题1-10图所示, 试求

1) 图中 i_1 与 u_{ab}



解: 由题知 $i = 0.9i_1$

对节点 a, 由 KCL 得:

$$i_{ab} = i_1 - i = 0.1i_1$$

$$\text{又 } i = \frac{u_{ab}}{R} = 2A$$

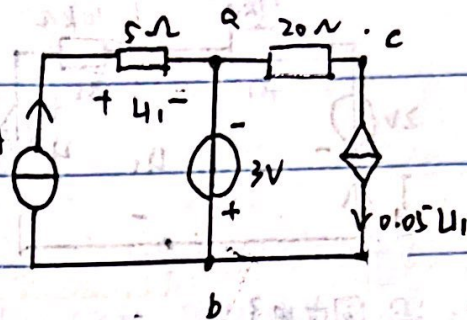
$$\therefore i_1 \approx 2.22A$$

$$u_{ab} = i_{ab} \cdot R_4$$

$$= 0.1i_1 \cdot 4$$

$$\approx 0.89V$$

2) 图中, u_{cb}



$$\therefore I_{5\Omega} = 2A$$

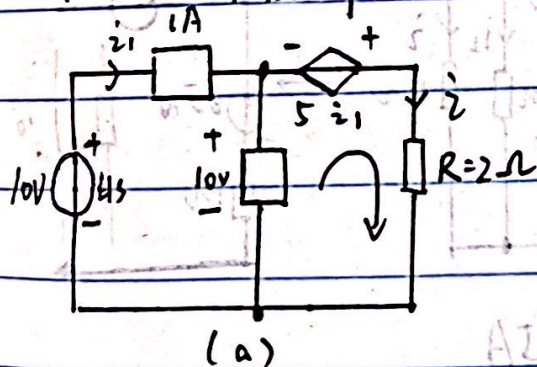
$$\text{解: } \frac{u_1}{5} = 2A \Rightarrow u_1 = 10V$$

$$\therefore u_{cb} = u_{ca} + u_{ab}$$

$$= -20 \times 0.05u_1 - 3 = -13V$$

1-18: 已知图 a 中: $R=2\Omega$, $i_1=1A$, 求 i . 已知图 b 中 $u_s=10V$, $i_1=2A$, $R_1=4.5\Omega$

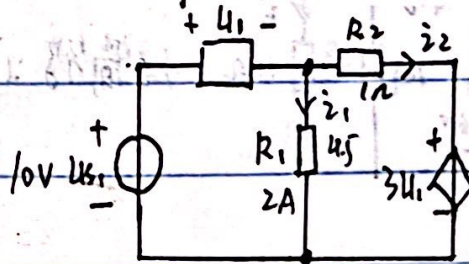
$R_2=1\Omega$, 求 i_2



解: 在右方回路中, 由 KVL 得:

$$-10 - 5i_1 + Ri = 0$$

$$\therefore i = 7.5A$$



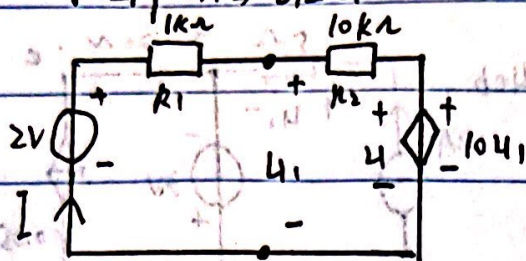
解: 在右方回路中, 由 KVL 得:

$$R_1 i_1 - 3u_1 - R_2 i_2 = 0$$

在左方回路中: $-u_s + u_1 + R_1 i_1 = 0$

$$\text{联立得: } i_2 = 6A$$

1-20: 求图中 u_1 与电压 u

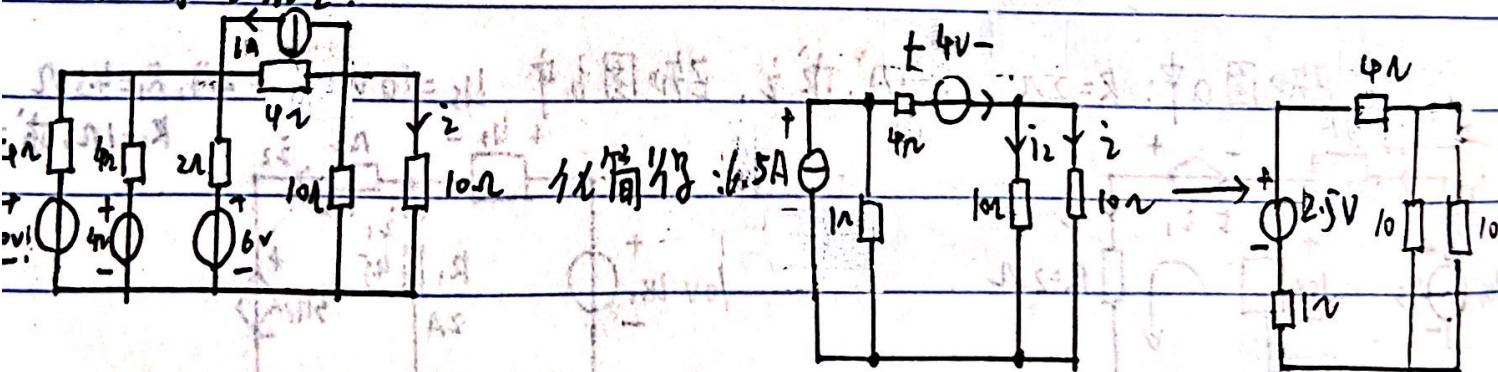


解: 设网中电流为 I , 方向如图. 补网

则: 由KVL得: $u_{AB} = u_{AC} + u_{CB}$

$$\begin{cases} -2 + R_1 I + R_2 I + 10 U_1 = 0 \\ -U_1 + R_2 I + 10 U_1 = 0 \end{cases} \text{ 联立得: } I = -\frac{9}{10^4} \text{ A}$$

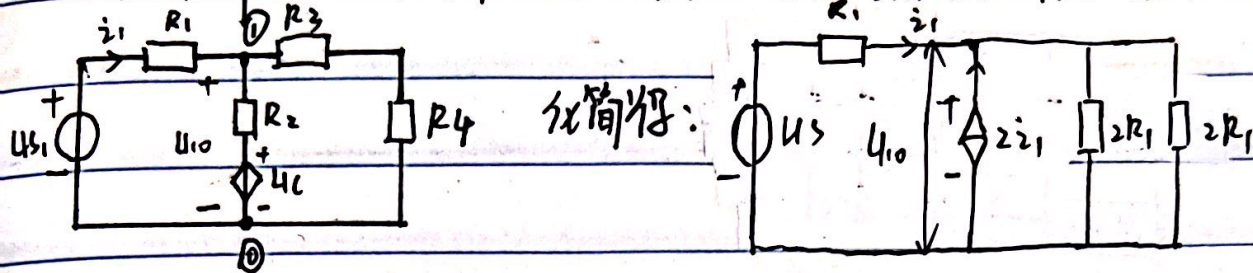
2-11: 求电流 i



由KVL得: $-2.5 + (4+1 + \frac{30 \times 10}{10+10})I = 0 \Rightarrow I = 0.25A$

故 $i = \frac{1}{2} = 0.125 \text{ A}$.

2-13: 图中 $R_1 = R_3 = R$, $R_2 = 2R$, CCVS 电压 $u_c = 4Ri_1$, 求 U_{10} .

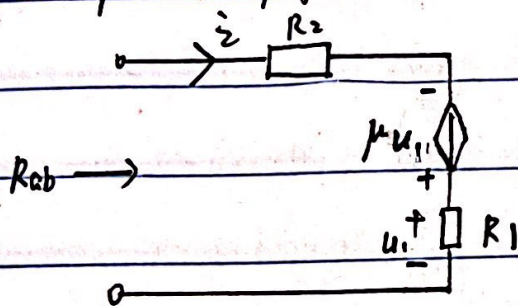


∴ 由 KVL 得: $U_{10} = 3Ri_1$

又由 KVL 得: $-U_s + Ri_1 + U_{10} = 0$

$$\therefore U_{10} = \frac{3}{4}U_s = 0.75U_s$$

2-14: 分别求 (a) (b) 的输入电阻 R_{ab} .

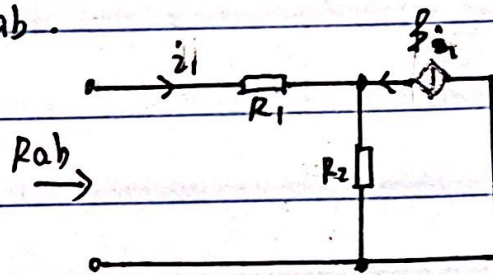


解: 由 KVL 得:

$$U_{ab} = R_2 i - \mu u_1 + U_1$$

$$\text{且 } i = \frac{U_1}{R_1}$$

$$\therefore R_{ab} = \frac{U_{ab}}{i} = (1 - \mu)R_1 + R_2$$



解: 由 KVL 得:

$$U_{ab} = R_1 i_1 + R_2 i_2$$

$$i_2 = i_1 + \beta i_1$$

$$\therefore R_{ab} = \frac{U_{ab}}{i_1}$$

$$\text{联立得: } R_{ab} = R_1 + (1 + \beta)R_2$$