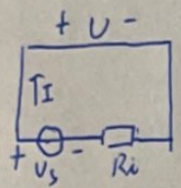
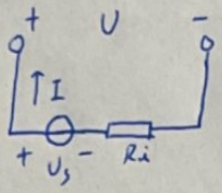
① 分别求图(a)、(b)、(c)电路中的电压U和电流I.



(a)短路

$I = \frac{U_s}{R_i}$

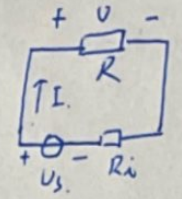
$U = 0V$



(b)开路

$I = 0$

$U = U_s$

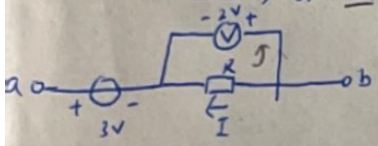


(c)接负载R.

$I = \frac{U_s}{R+R_i}$

$U = IR = \frac{U_s}{R+R_i}R$

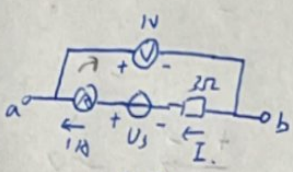
② 求(a)中U_{ab}，(b)中R，(c)中U_s，(d)中I.



(a)

$2 - 3 + U_{ab} = 0$

$U_{ab} = 1(V)$.



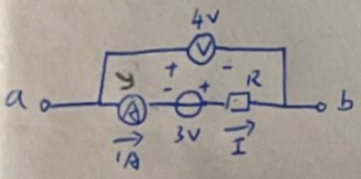
(c)

$U_R = IR = 1 \times 3 = 3(V)$.

$1 + U_R - U_s = 0$

$1 + 3 - U_s = 0$

$U_s = 4(V)$

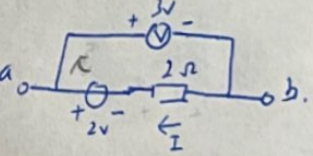


(b)

$-3 + U_R - 4 = 0$

$U_R = 7(V)$.

$R = \frac{U_R}{I} = \frac{7}{1} = 7(\Omega)$



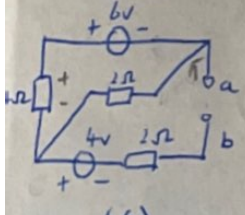
(d)

$3 + U_R - 2 = 0$

$U_R = -1(V)$.

$I = \frac{U_R}{R} = -\frac{1}{2}(A)$.

③ 求U_{ab}.



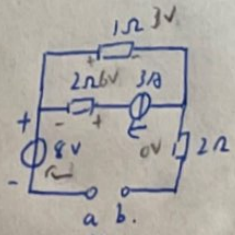
(a)

$-6 + I(4+2) = 0$

$I = 1(A)$

$U_{ab} = -6 + 4 \times 1 + 4$

$= 2(V)$

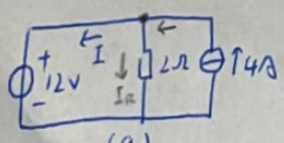


(b)

$U_{ab} = -8 + 3 \times 1$

$= -5(V)$

④ 求U和I.

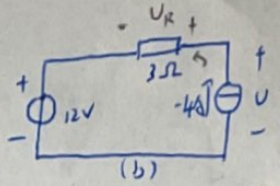


(a).

$I_s = I + I_R$

$4 = I + \frac{12}{2}$

$I = -2(A)$

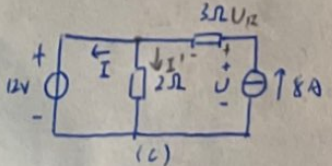


(b)

$U_R + U_s - U = 0$

$-4 \times 3 + 12 - U = 0$

$U = 0$.



(c)

$I_s = I + I'$

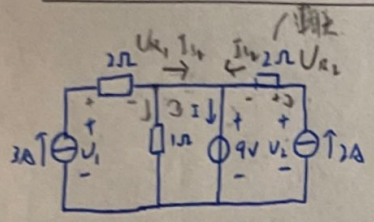
$8 = I + \frac{12}{2}$

$I = 6(A)$

$-U + U_R + U_s = 0$

$-U + 8 \times 3 + 12 = 0$

$U = 36(V)$.



(d)

$U_S - U_1 + U_{R_1} = 0$

$9 - U_1 + 3\times 2 = 0$

$U_1 = 15(V)$.

$U_2 - U_1 + U_{R_1} - U_{R_2} = 0$

$U_2 - 15 + 3\times 2 - 2\times 2 = 0$

$U_2 = 13(V)$.

$3 = I_{S_1} + \frac{9}{1}$

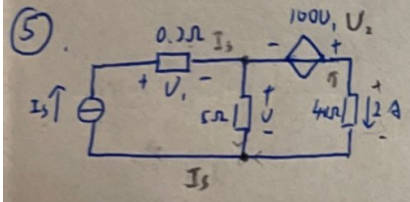
$I_{S_1} = -6(A)$.

$I = I_{S_1} + I_{S_2}$

$I = -6 + 2$

$I = -4(A)$.

⑤.



$\begin{cases} U_1 = 0.2 I_S \\ U_2 = 20 I_S \\ U = (I_S - 2)\times 5 \end{cases}$

$2 + I = I_S$

$I = I_S - 2$.

$\Downarrow$

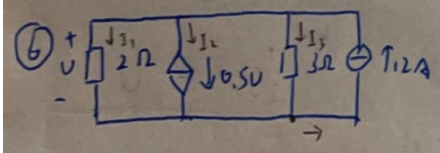
$U_2 + U - 2\times 40 = 0$

$20 I_S + (I_S - 2)\times 5 - 80 = 0$

$25 I_S = 90$

$I_S = 3.6(A)$.

⑥



$\begin{cases} I_1 = \frac{U}{2} \\ I_2 = 0.5U \\ I_3 = \frac{U}{3} \end{cases}$

$\Downarrow$

$I_S = I_1 + I_2 + I_3$

$12 = \frac{U}{2} + 0.5U + \frac{U}{3}$

$U = 9(V)$.

$P_{I_S} = u \cdot i$

$P_{I_S} = 9\times 12$

$P_{I_S} = 108(W)$.

(7) 参考方向下，电阻的 $\alpha > 90°$ 代表什么物理意义？

表示负电导，在此电压下电阻的交流电负为负，当电压下降，电流会增大.