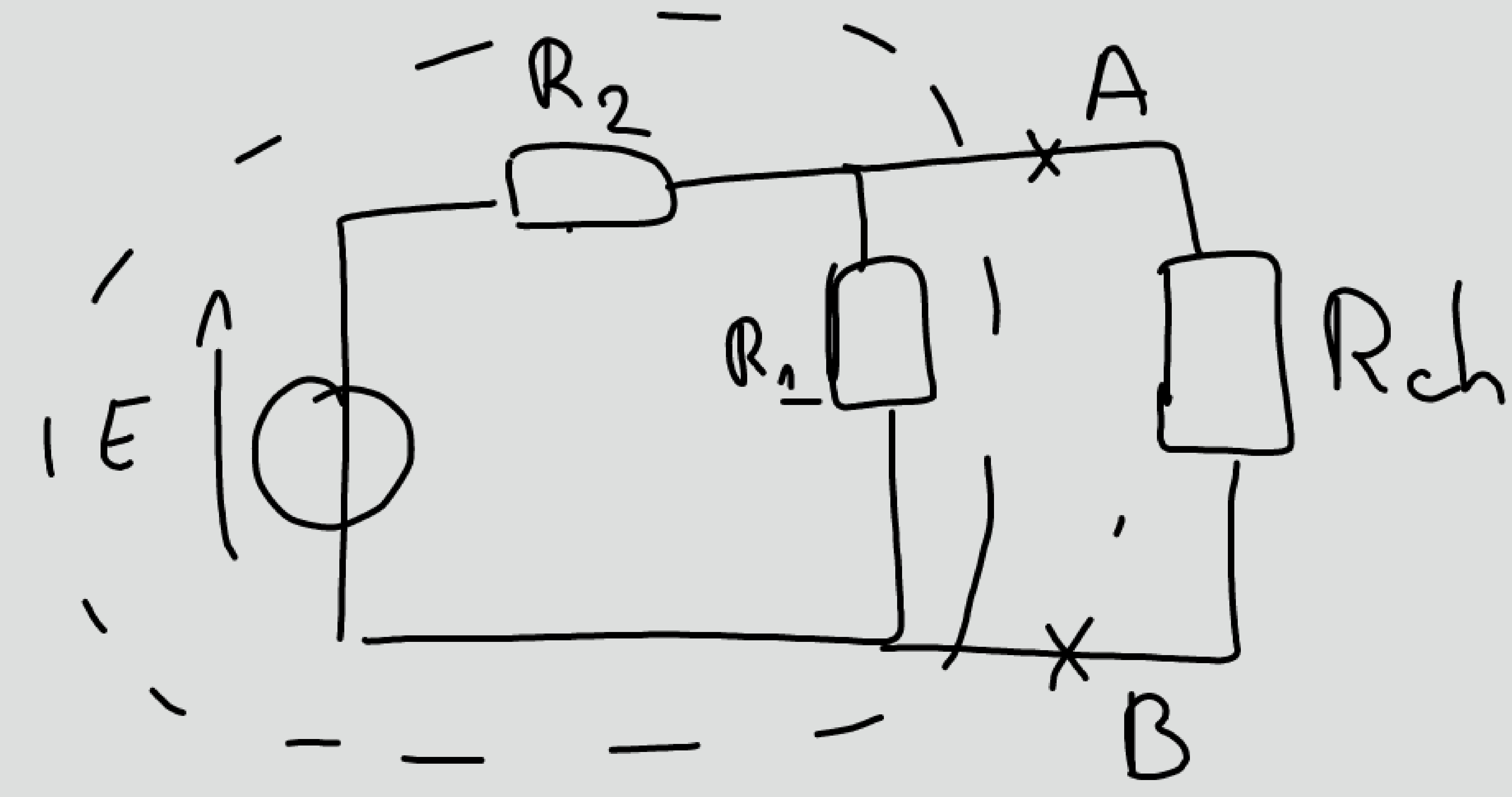
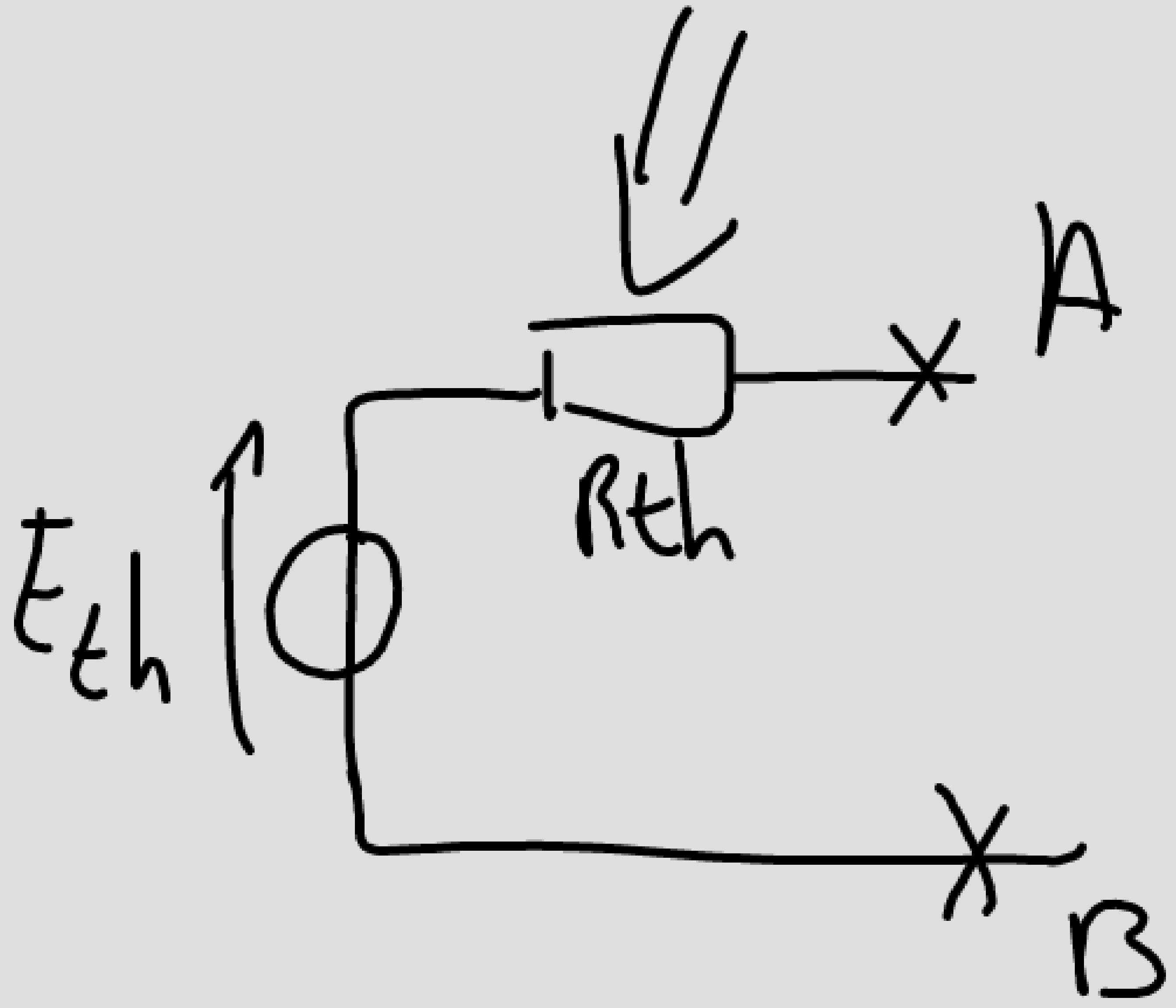
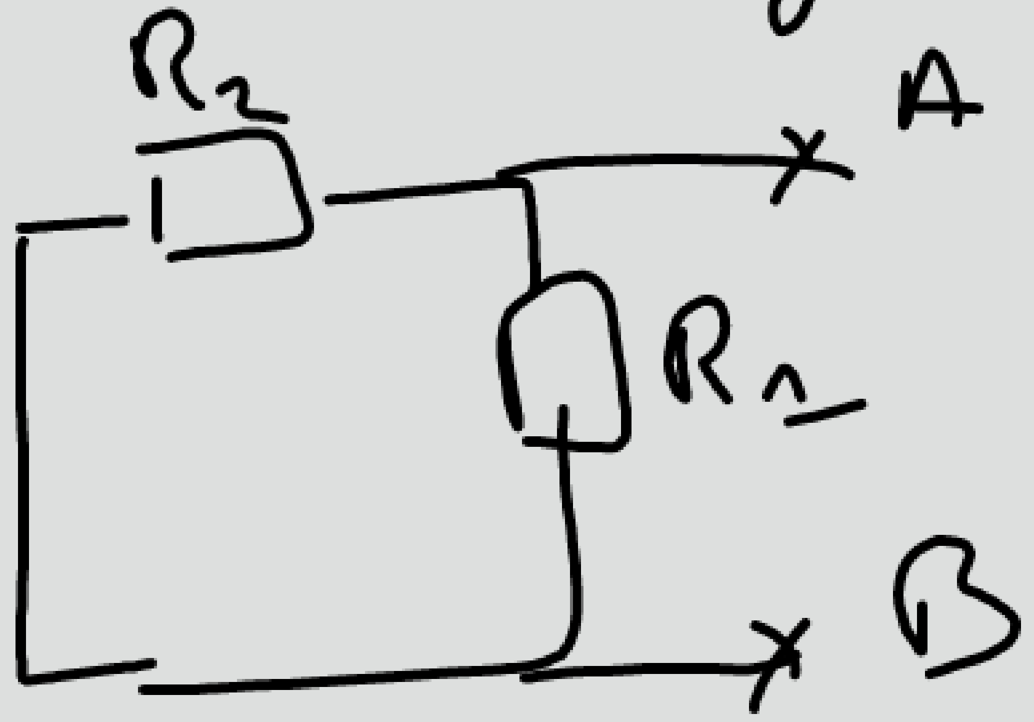




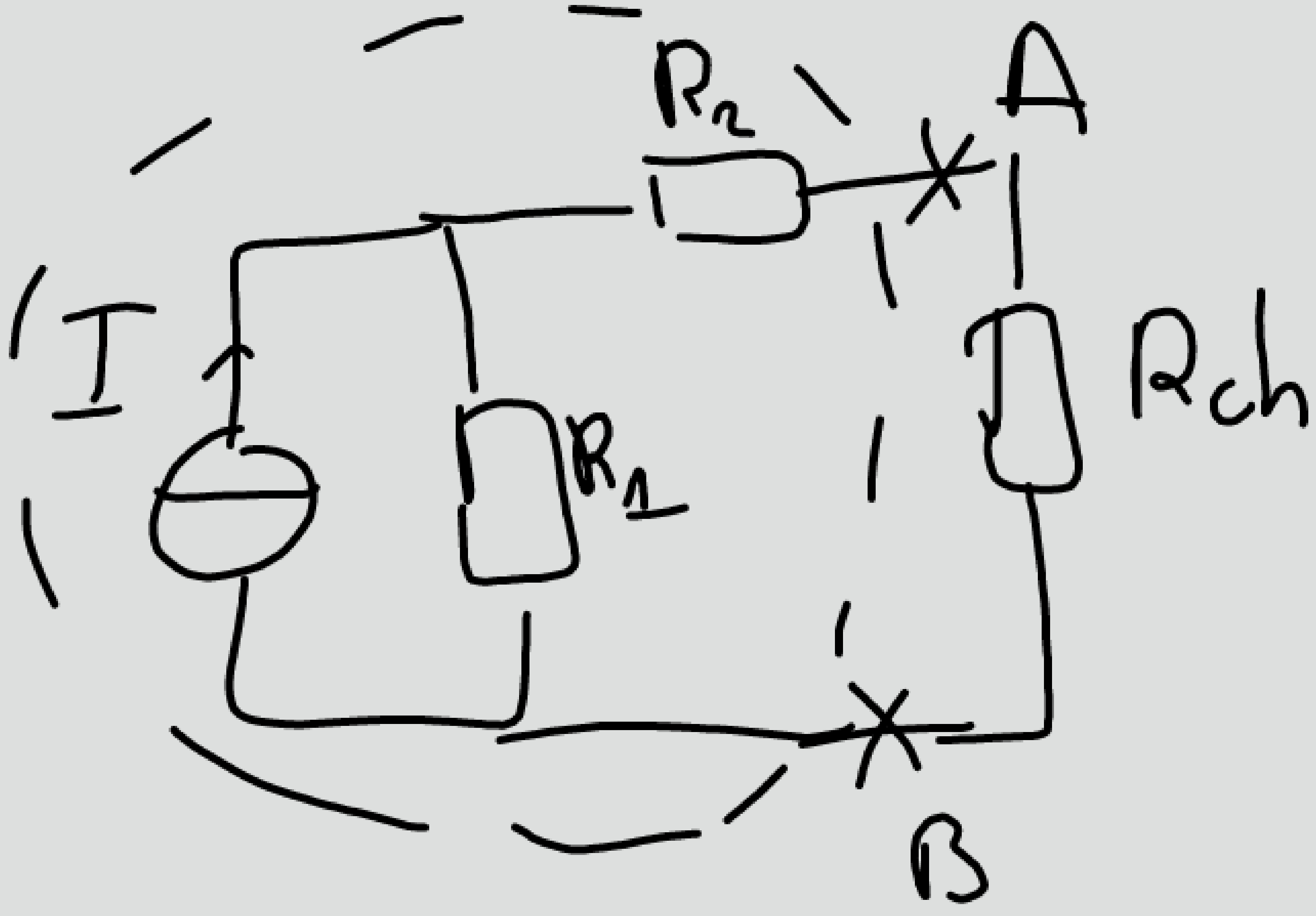
• On éteint les géné :

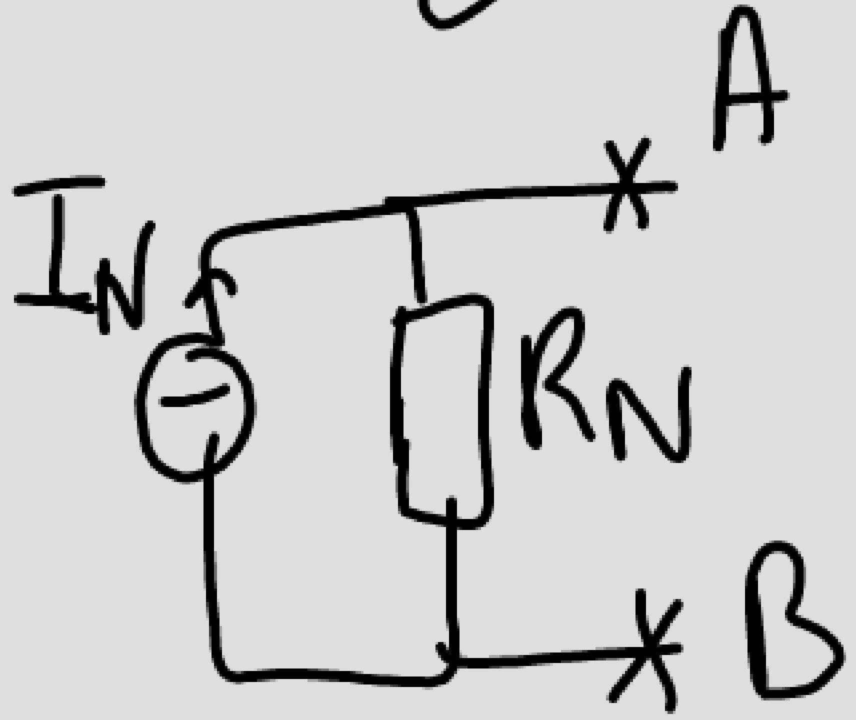


$$R_{th} = R_{eq} = \frac{R_1 R_2}{R_1 + R_2}$$

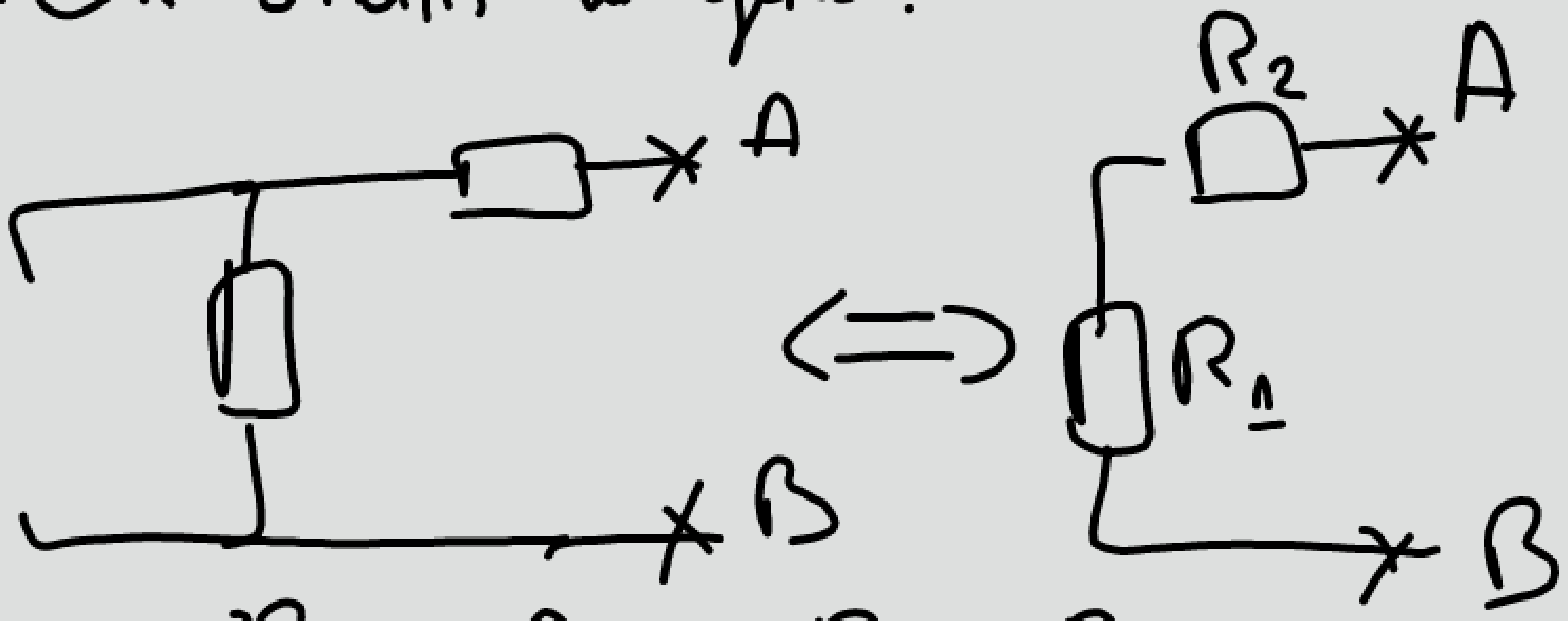
• On fait un circuit ouvert après AB : $i = 0$ diviseur de tension

$$\rightarrow U_{AB} = E \times \frac{R_1}{R_1 + R_2} = E_{th}$$



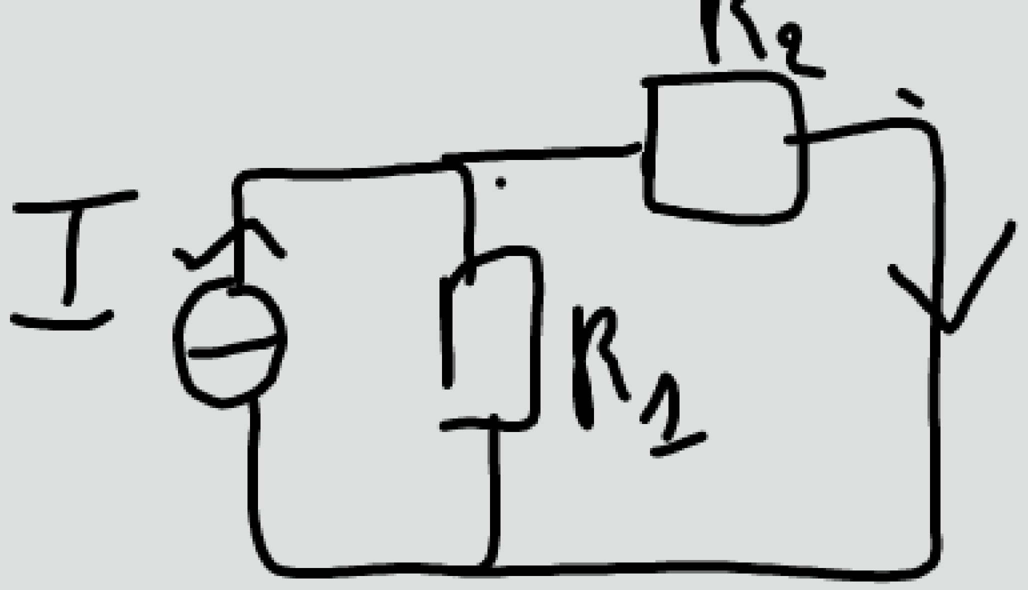


. On éteint les géné :

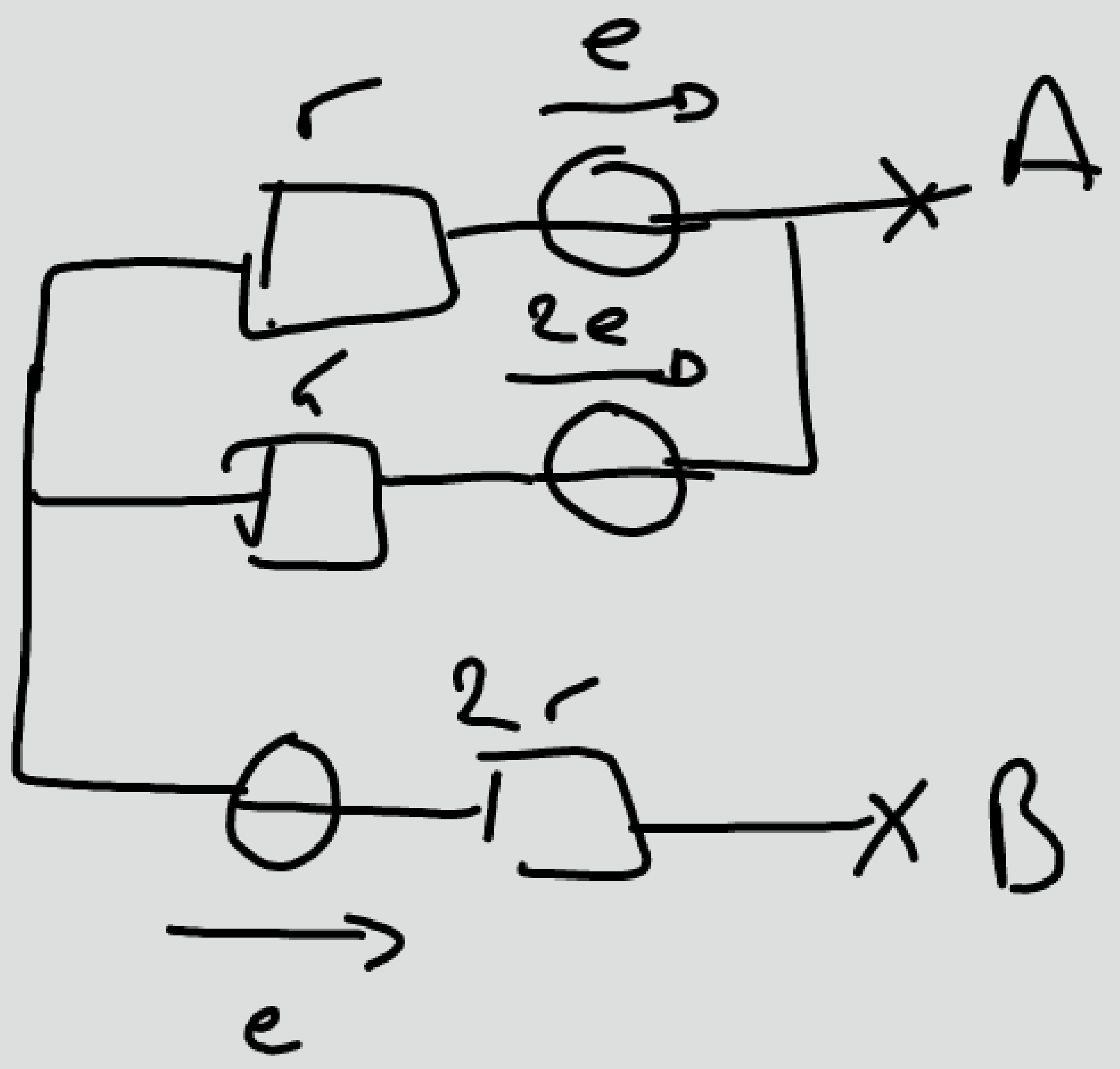


$$R_N = R_{eq} = R_1 + R_2$$

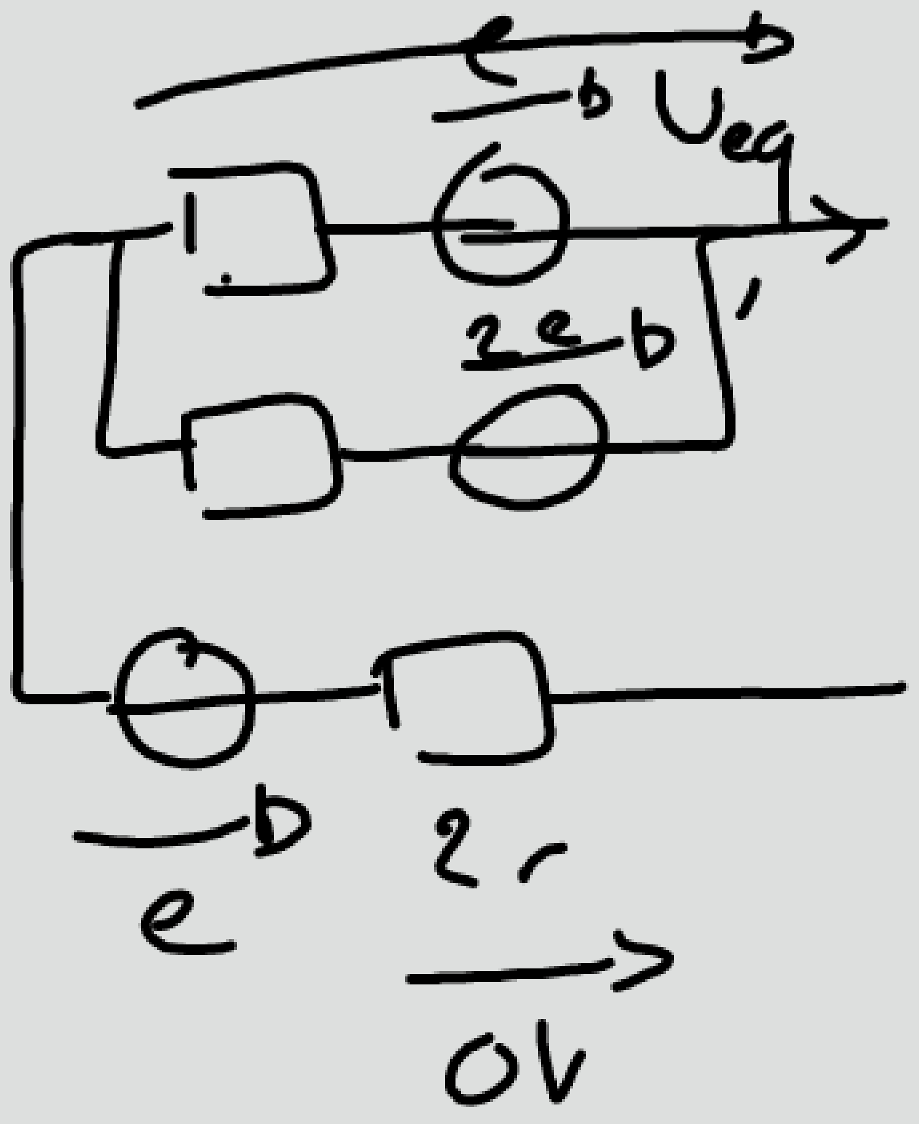
. On fait un court-circuit en AB :



$$i_N = \frac{R_1}{R_1 + R_2} I$$



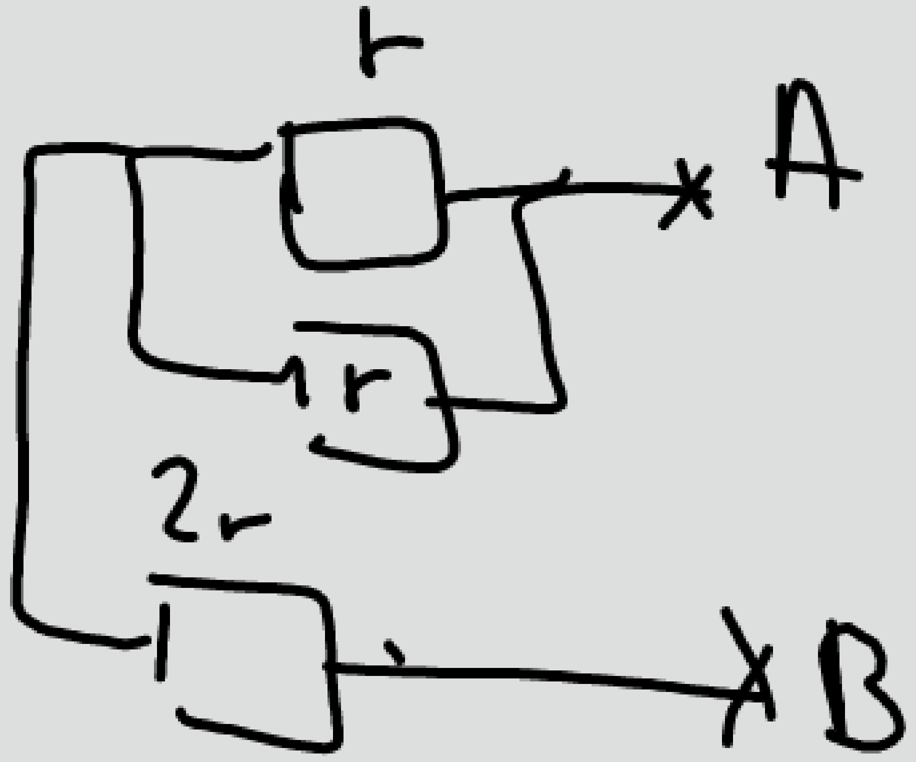
. On met un circuit ouvert



$i = 0$

$U_{AB} = E_{th} = ?$

On éteint les géné :

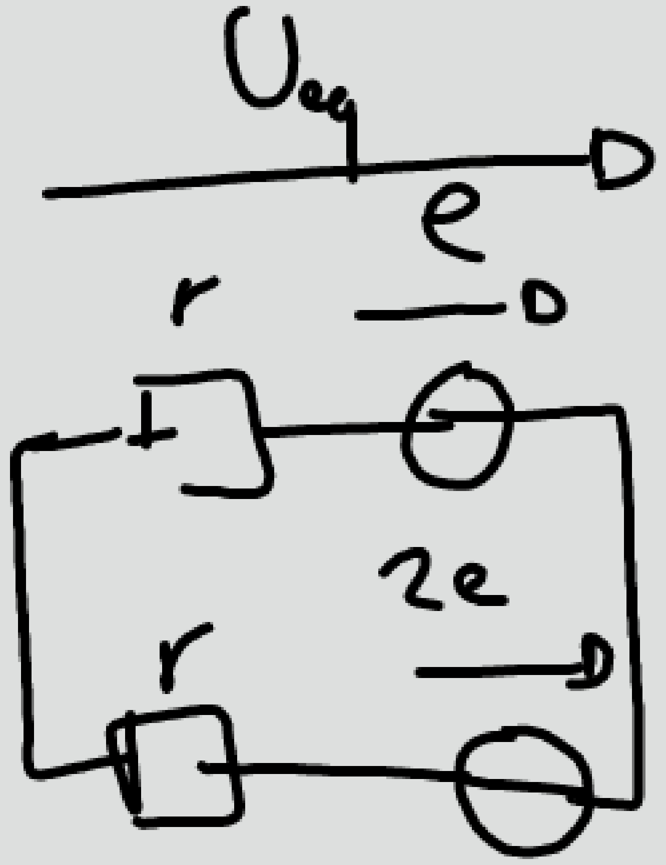


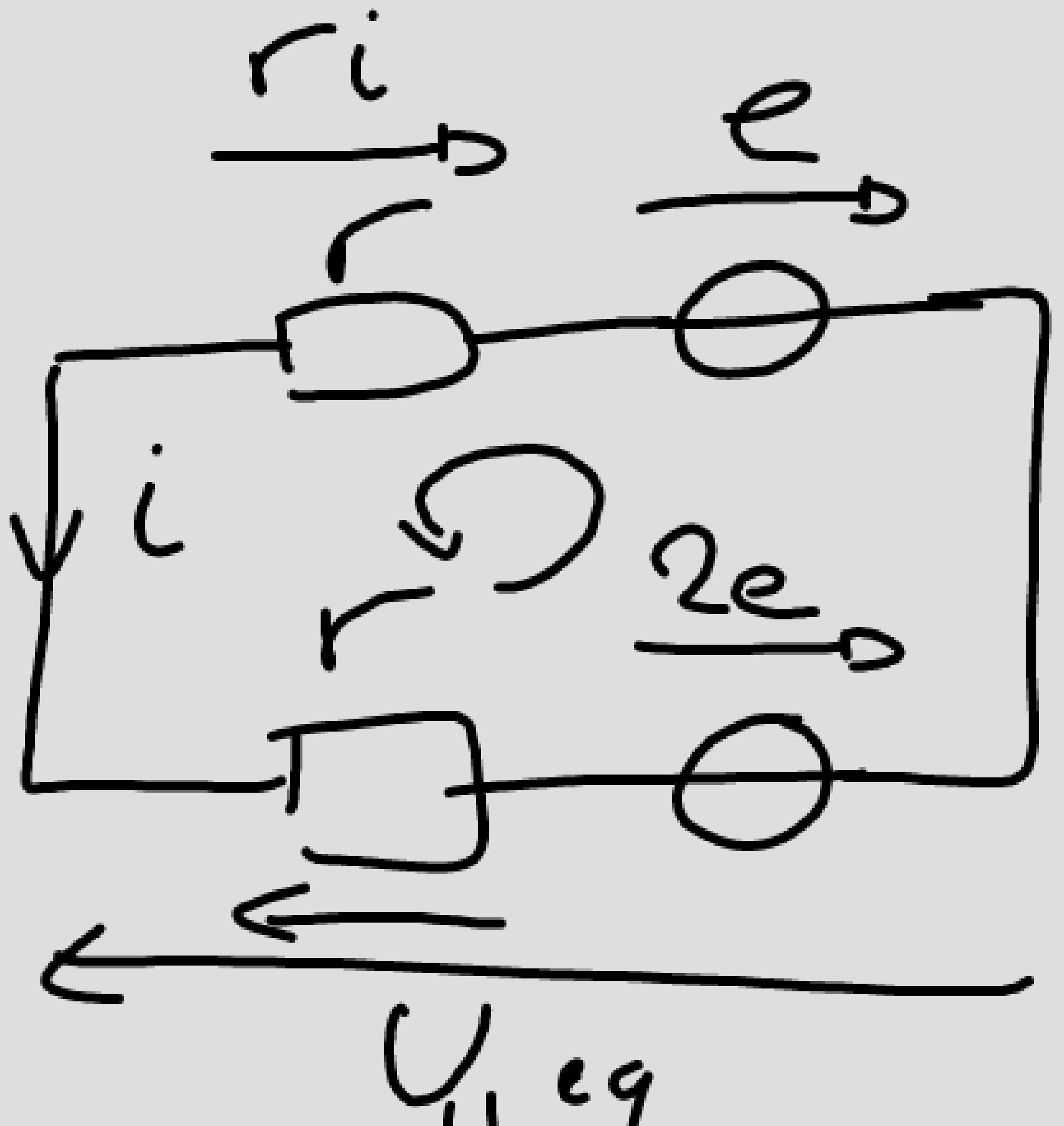
$R_{eq} = R_{th} = \frac{5r}{2}$

D'après la loi des mailles :

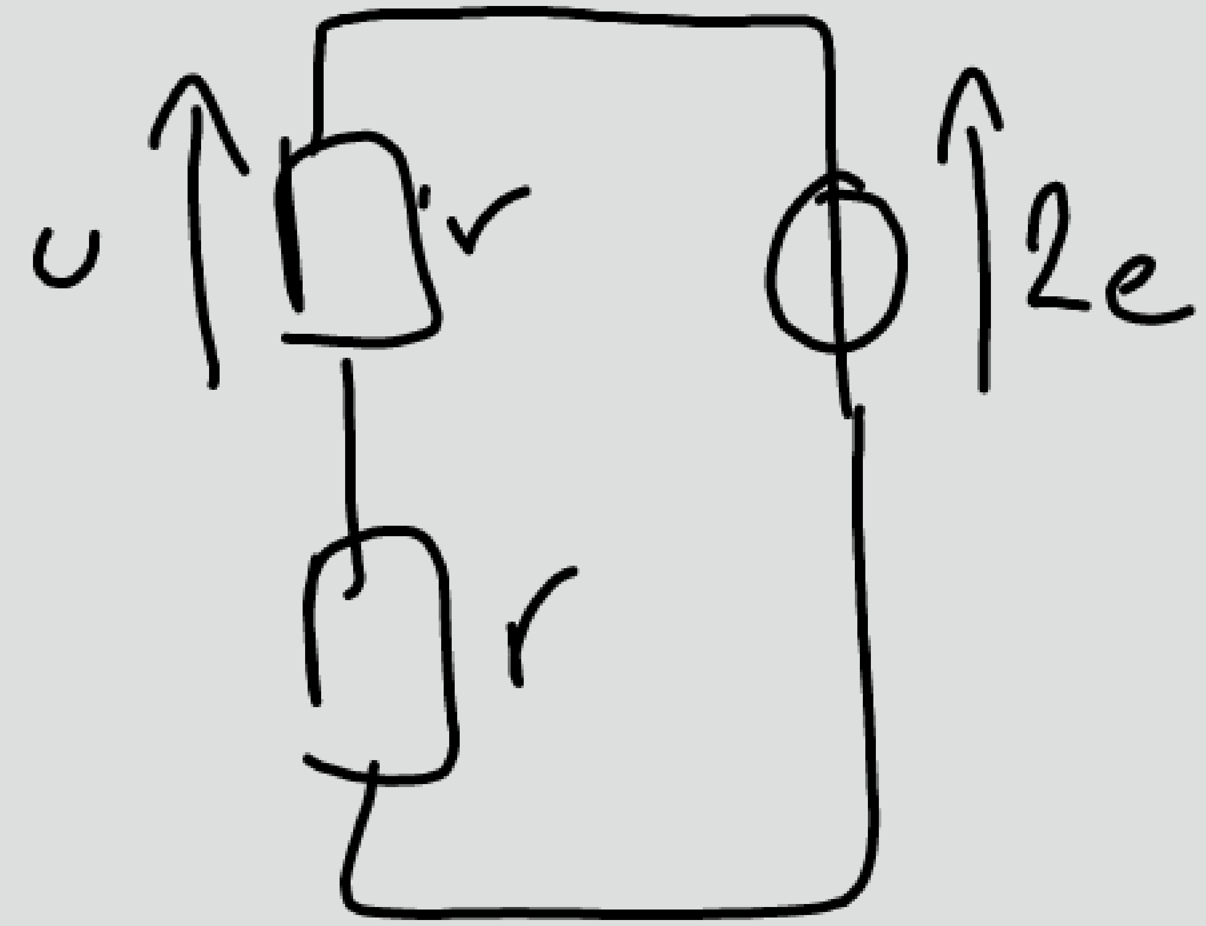
$U_{AB} = U_{eq} - e$

Que vaut U_{eq} ?

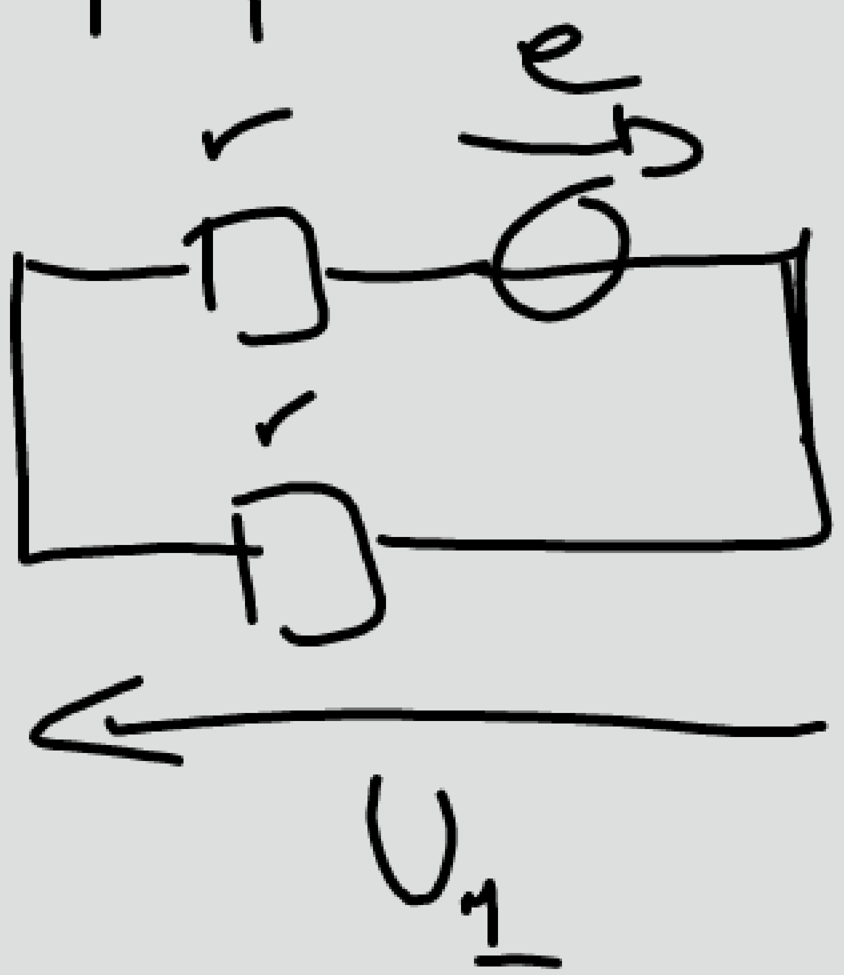




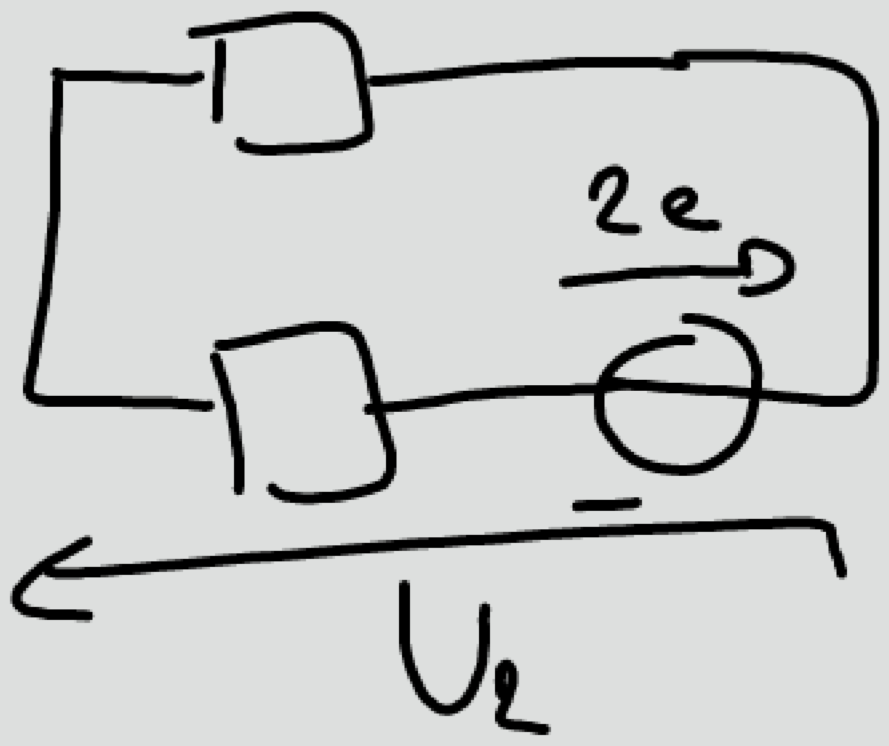
$$U = \frac{r}{r+r} \times 2e = \frac{2e}{2}$$



Superposition :



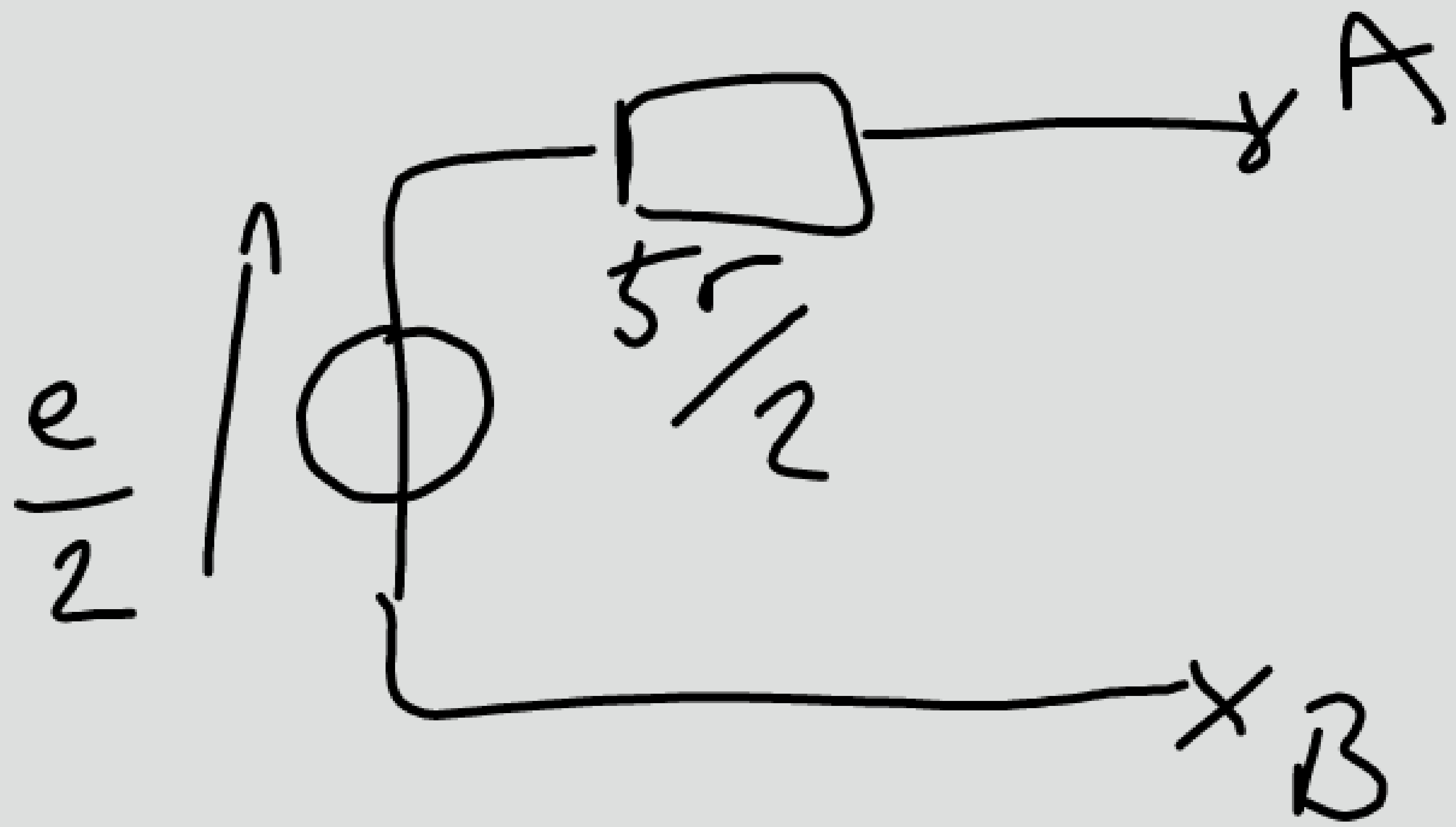
$$U_1 = e \times \frac{r}{2r}$$
$$= \frac{e}{2}$$

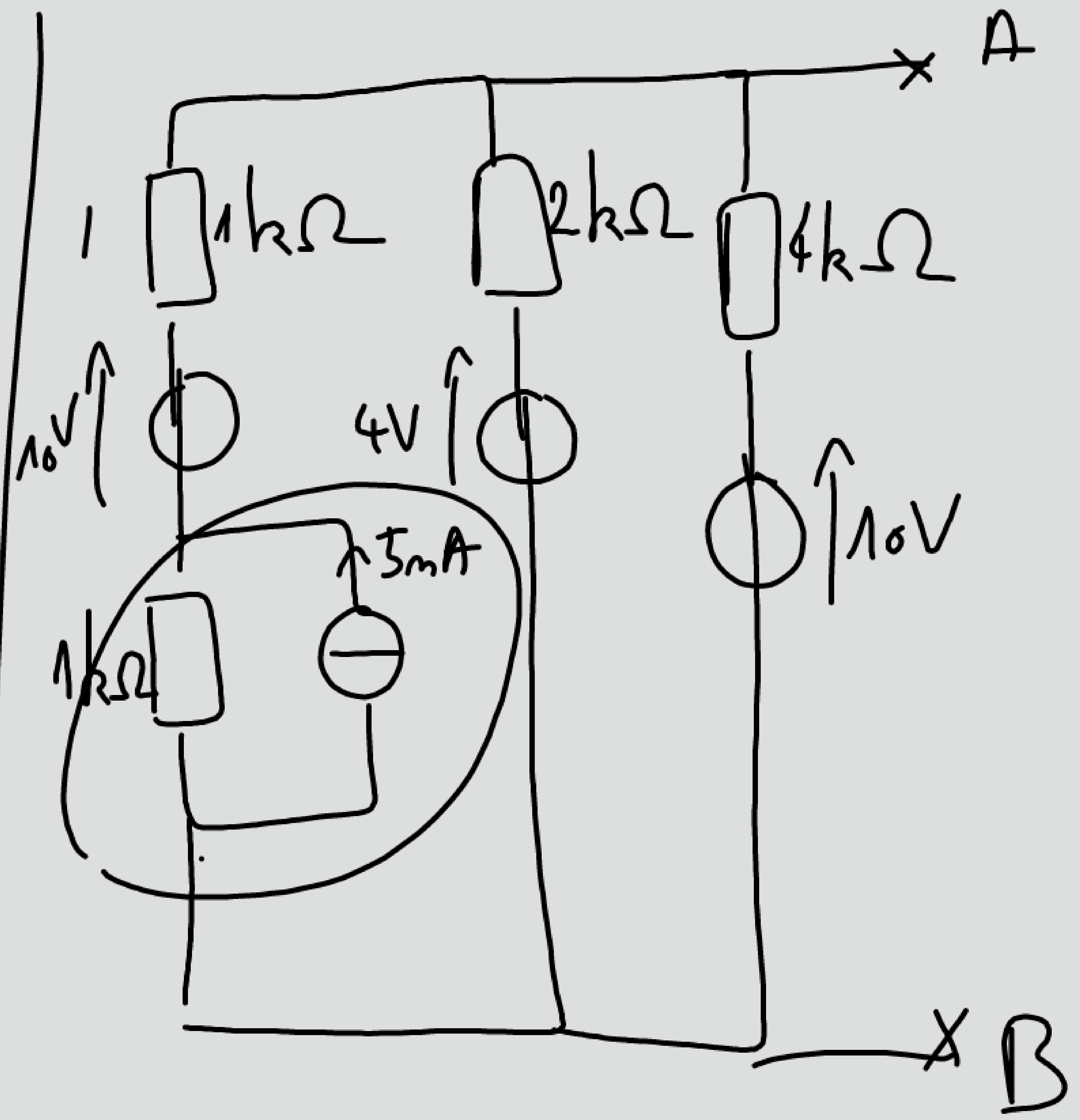


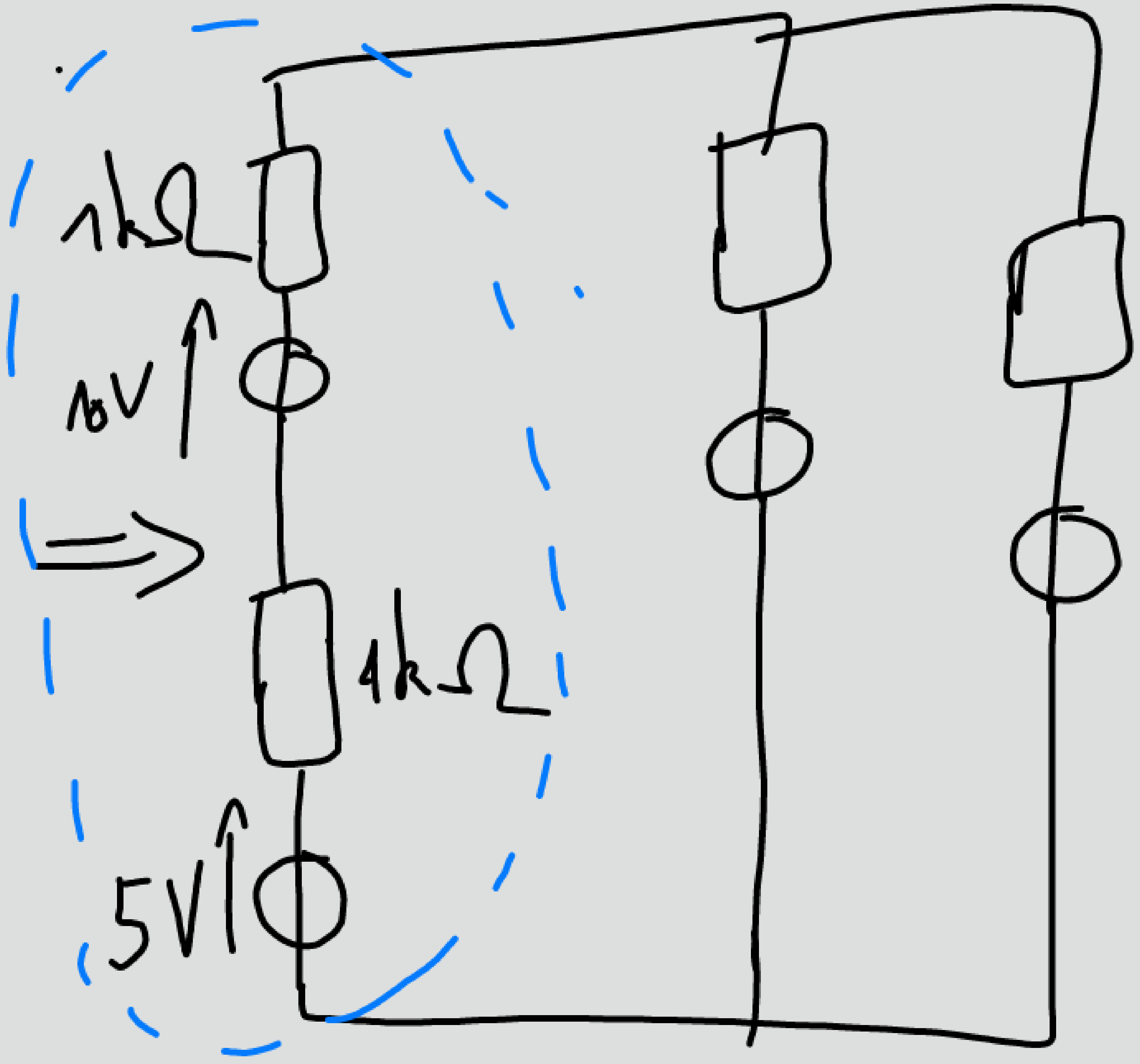
$$U_2 = 2e - \frac{2e}{2} = e$$

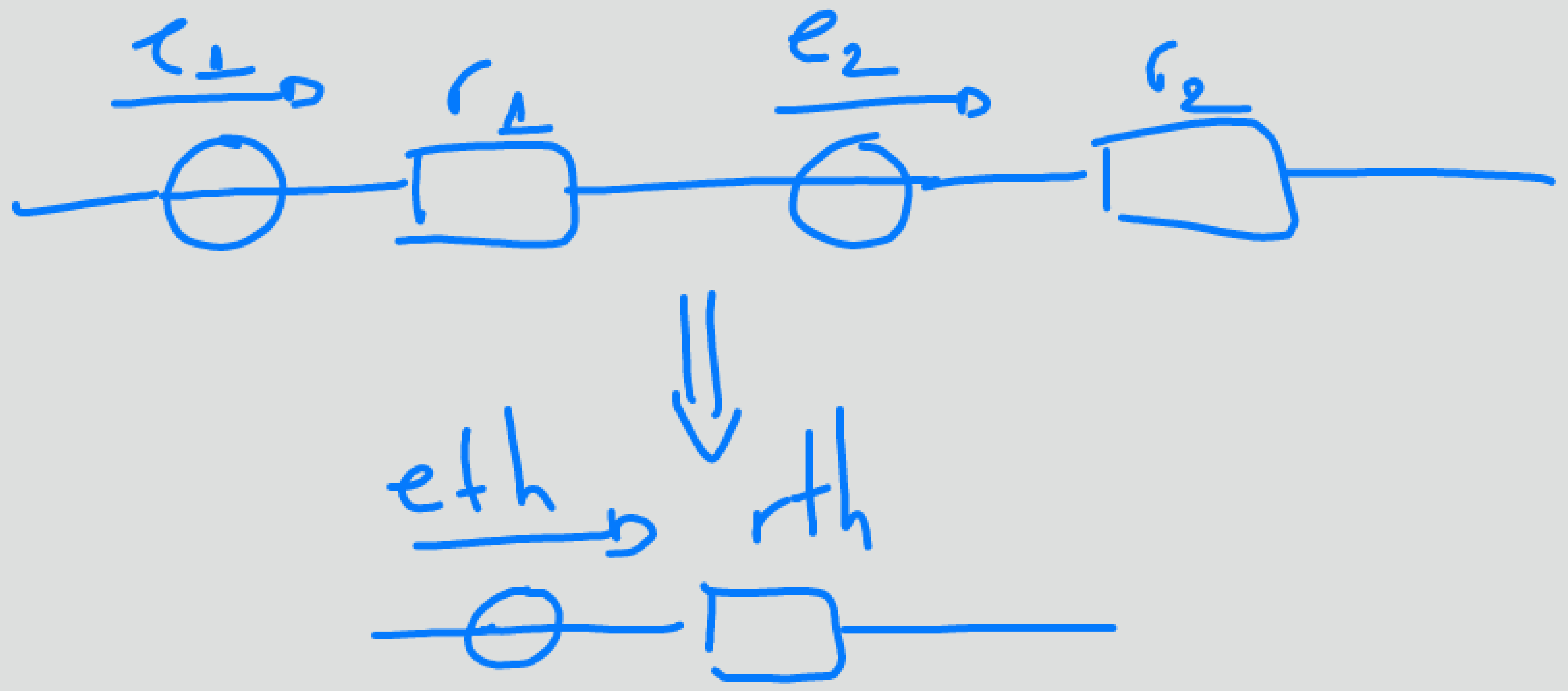
$$U_{eq} = U_1 + U_2$$
$$= e + \frac{e}{2} = \frac{3e}{2}$$

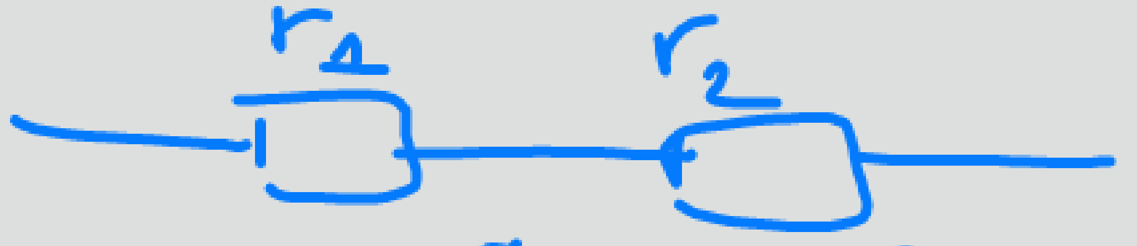
$$U_{ab} = E_{th} = U_{eq} - e = \frac{e}{2}$$









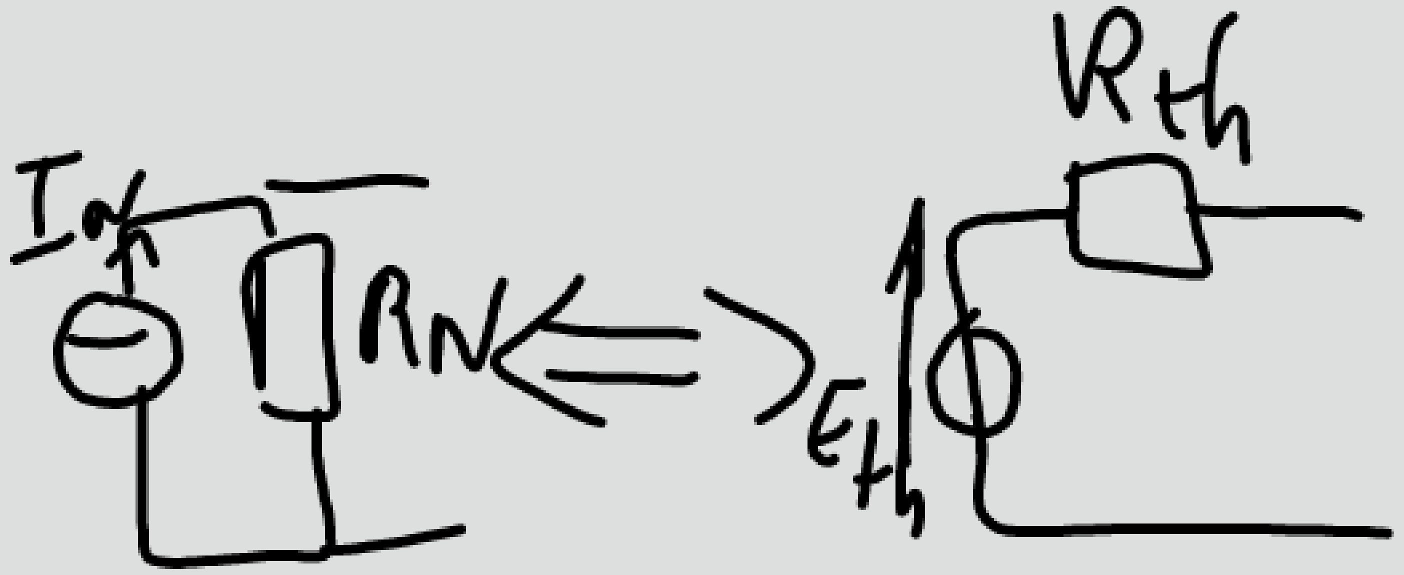
• éteint géné : 

: $r_{th} = r_1 + r_2$

• circuit ouvert : 

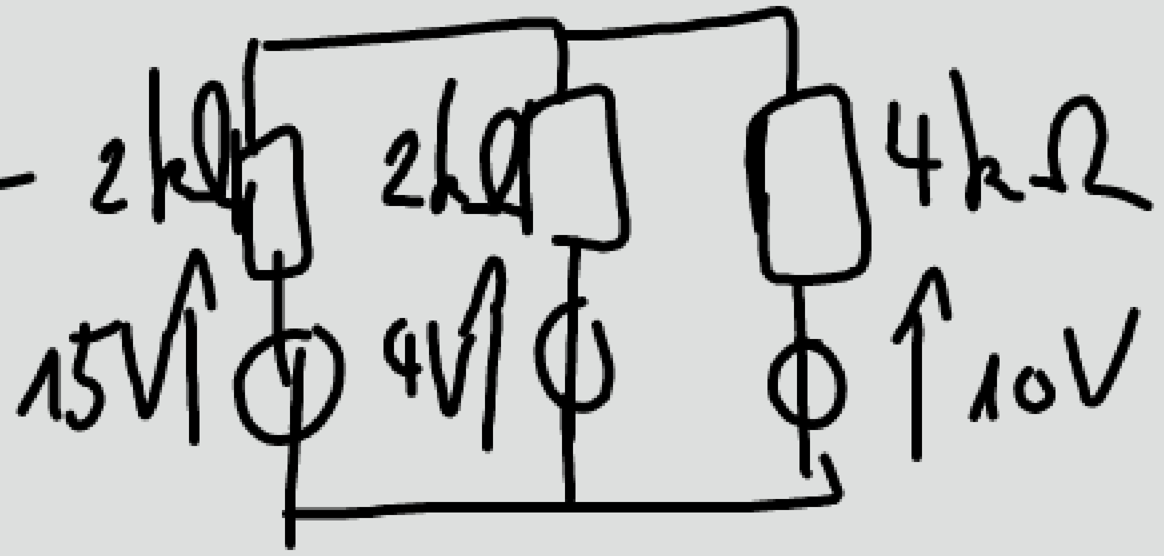
$i = 0$

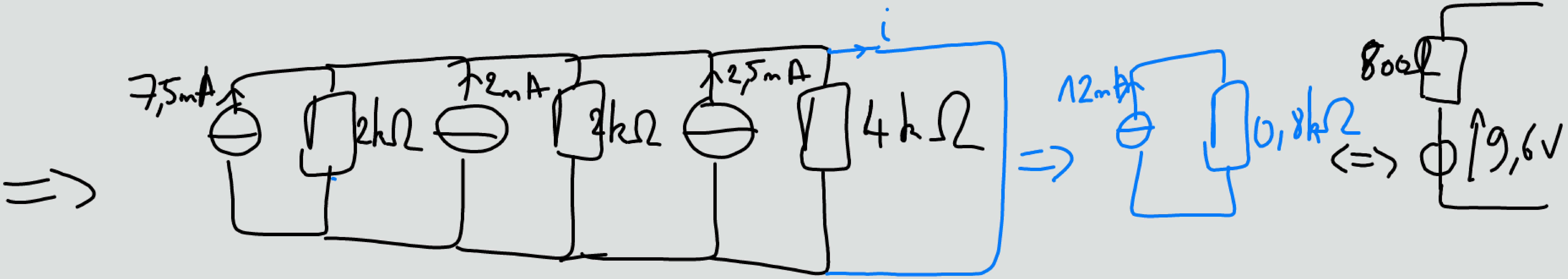
$e_{th} = e_1 + e_2$

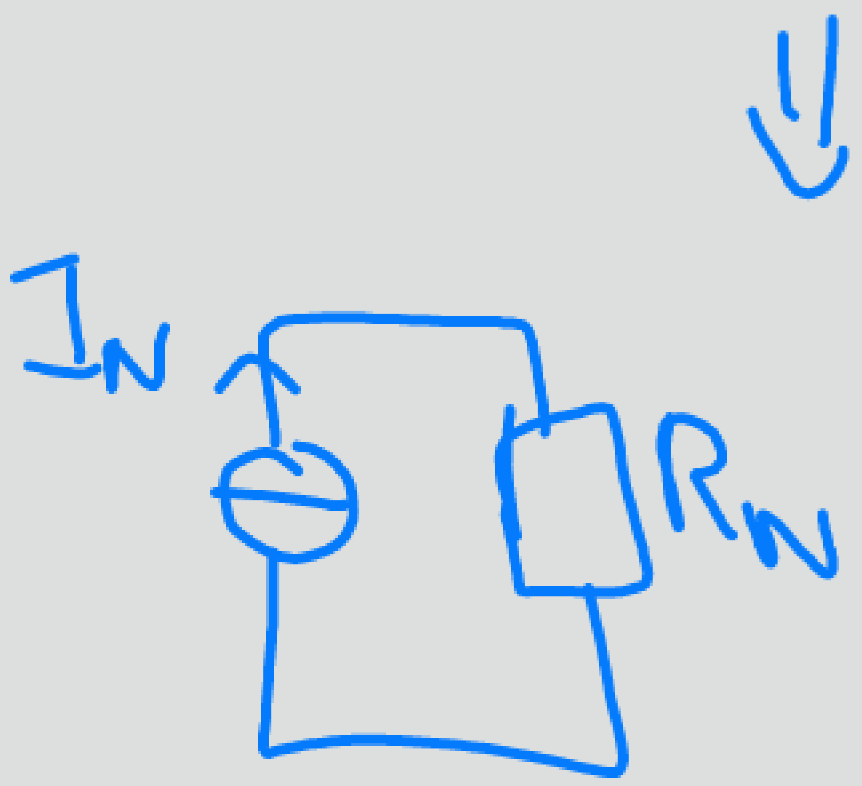


$R_{th} = R_N$

$E_{th} = R_{th} I_N$

Donc 

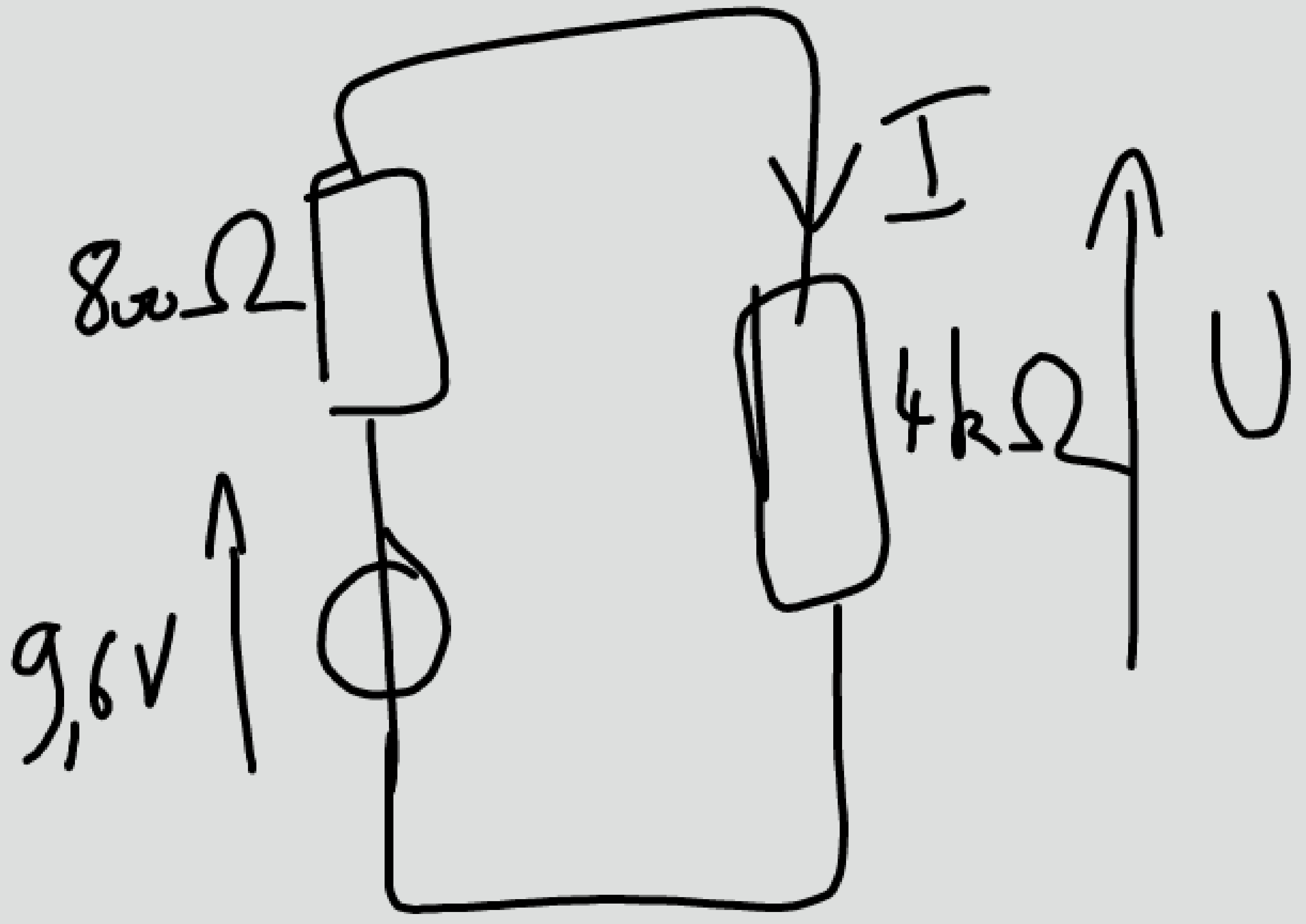




- On éteint les géné : $\frac{1}{R_N} = \frac{1}{2k} + \frac{1}{2k} + \frac{1}{4k} \Rightarrow R_N = 0{,}8k\Omega$

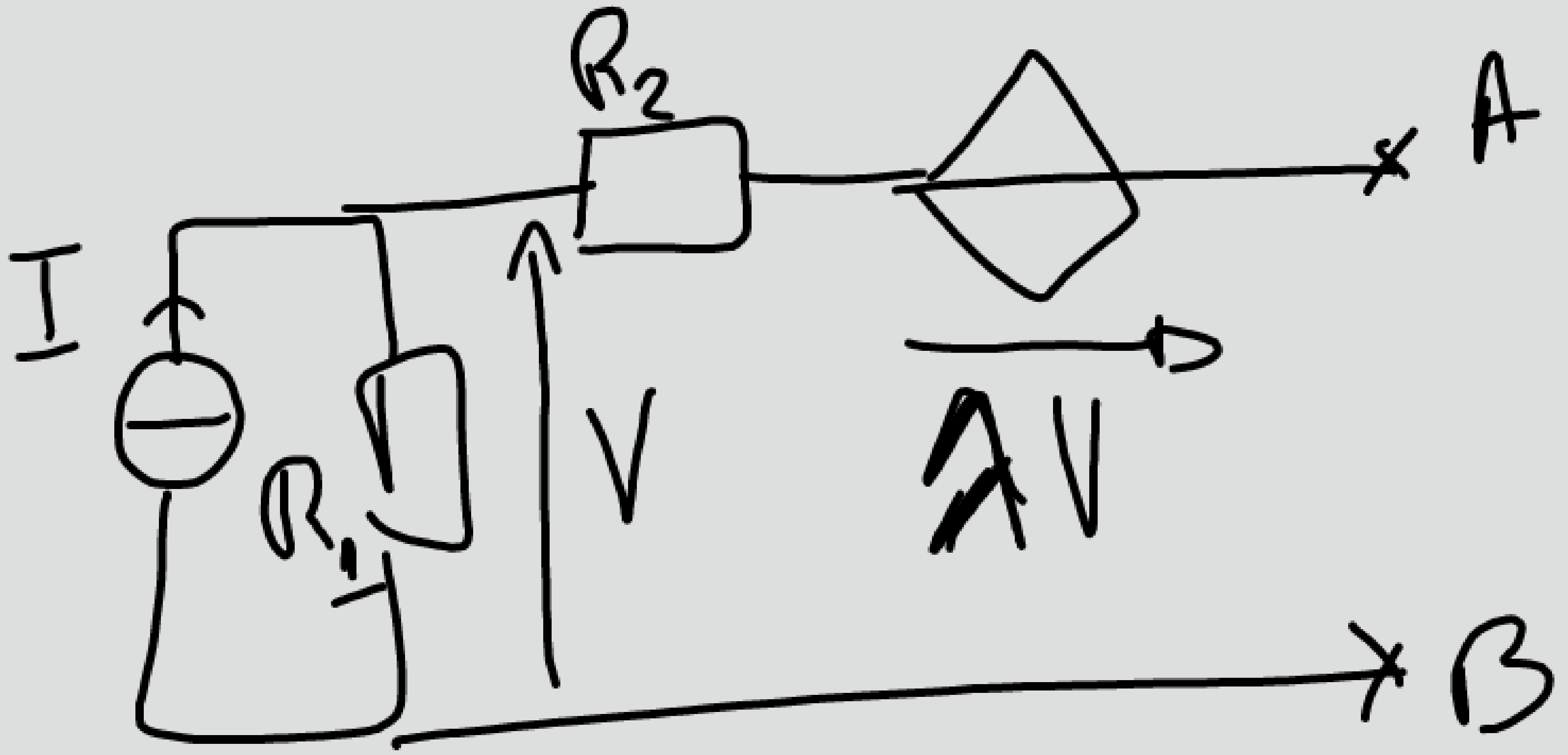
- On fait un court-circuit : $i_N = 7{,}5m + 2m + 2{,}5m$

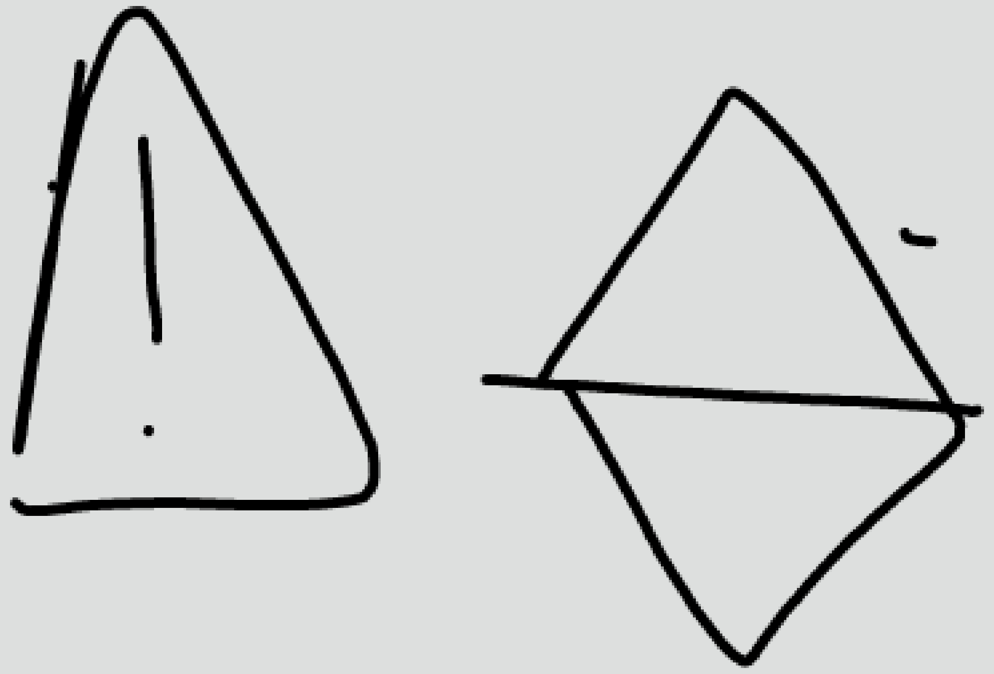
$= 12mA$



$$U = 9{,}6 \times \frac{4k}{4{,}8k} = 8\,V$$

$$I = 2mA$$

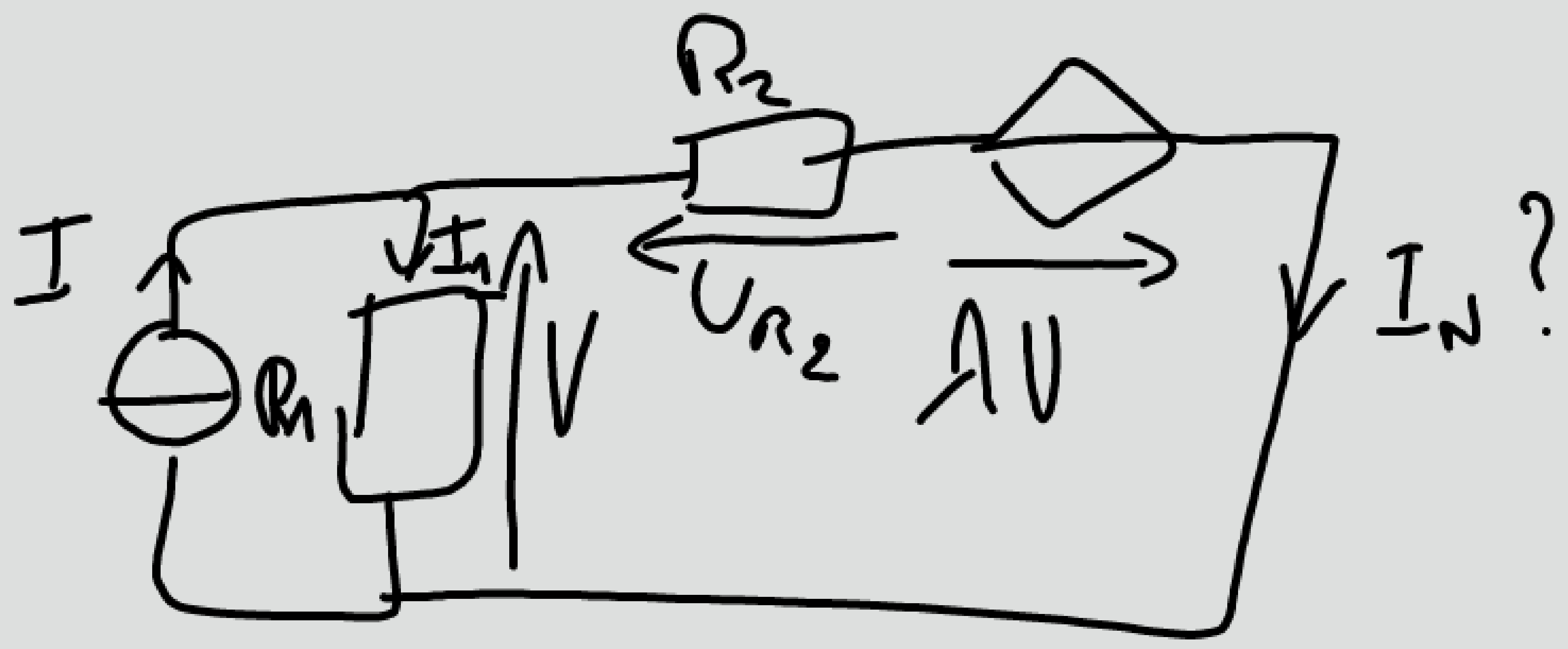




géné dépendant

$\rightarrow$ problème

Calcul de I_N : courant lorsque court-circuit :



$$I_N + I_1 = I$$

$$I_1 = \frac{V}{R_1}$$

$$I_N = I - \frac{V}{R_1}$$

$$0 = V + \lambda V - R_2 I_N$$

$$R_2 I_N = V(1+\lambda)$$

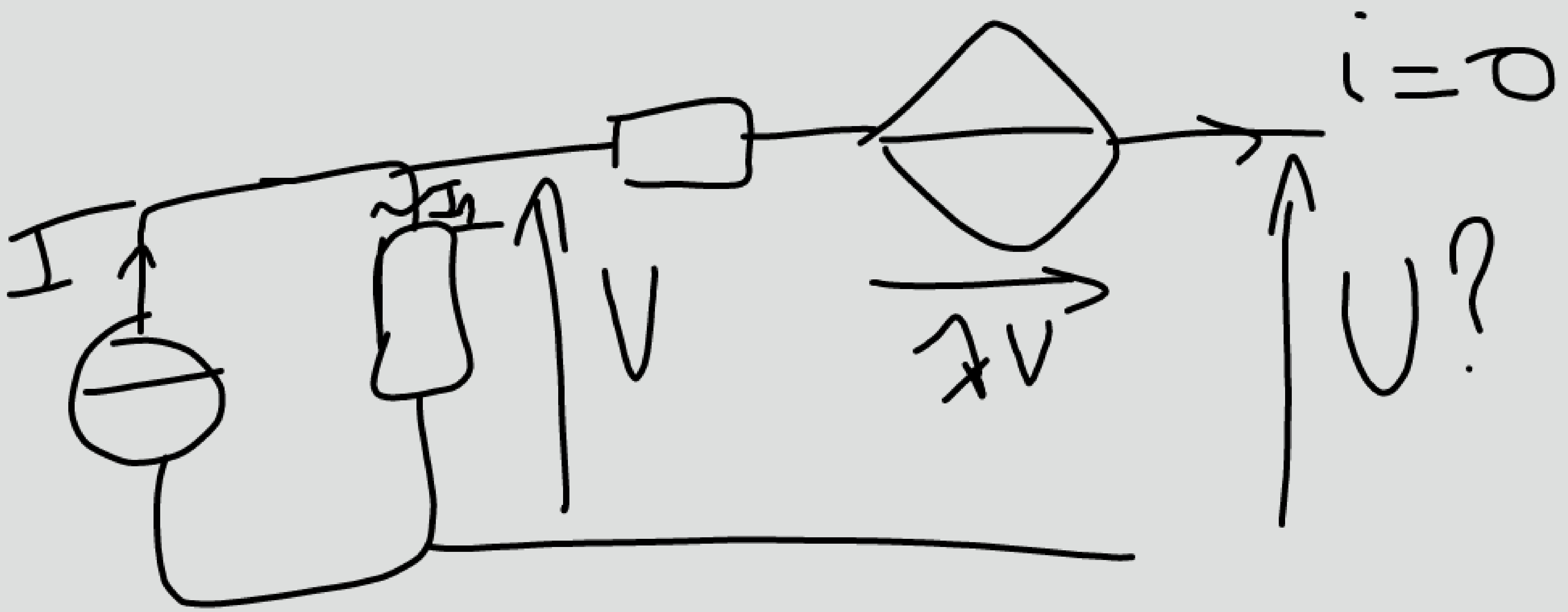
$$V = \frac{I_N R_2}{1+\lambda} \Longrightarrow I_N = I - \frac{I_N R_2}{R_1(1+\lambda)}$$

$$\Updownarrow$$

$$I_N\left(1 + \frac{R_2}{R_1(1+\lambda)}\right) = I$$

$$\Updownarrow$$

$$\boxed{I_N = I \times \frac{R_1(1+\lambda)}{R_2 + R_1(1+\lambda)}}$$



$$U = E_{th} = V + \lambda V + 0 R_2$$

$$E_{th} = V(1+\lambda)$$

$$I = I_1 \Longrightarrow V = R_1 \times I \Longrightarrow E_{th} = R_1(1+\lambda) I$$

Or $E_{th} = R_{th} I_N$

donc $R_{th} = \dfrac{E_{th}}{I_N}$

$$= \frac{\cancel{R_1(1+\lambda)}\cancel{I}}{\cancel{I}\dfrac{\cancel{R_1(1+\lambda)}}{R_2+R_1(1+\lambda)}}$$

$$= R_2 + R_1(1+\lambda)$$