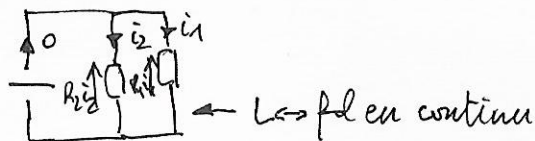


Corrigé DM

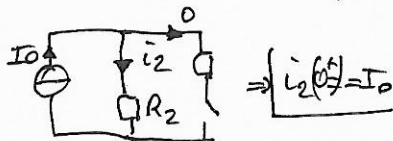
1) Pour $t < 0$:



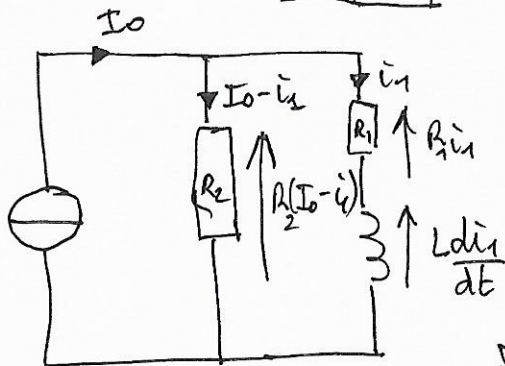
Donc $i_2 = -i_1 (LdN)$, $LdR \Rightarrow R_2 i_2 = R_1 i_1 \Rightarrow \underline{i_1 = i_2 = 0}$

i_1 continue dans une bobine $\Rightarrow i_1(0^+) = i_1(0^-) = 0$

Pour $t=0^+$:



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LdR à droite :

$$R_2(I_0 - i_1) = R_1 i_1 + L \frac{di_1}{dt}$$

$$\Leftrightarrow (1) \frac{di_1}{dt} + i_1 \left(\frac{R_1 + R_2}{L} \right) = \frac{R_2 I_0}{L}$$

Donc $\tau = \frac{L}{R_1 + R_2}$, en s.

(Justification de l'unité : $\frac{di_s}{dt}$ en $A.s^{-1}$, donc $\frac{R_1 + R_2}{L}$ en s^{-1})

3] (1) a pour SG : $i_1 = \underbrace{A e^{-t/\tau}}_{s_H} + \underbrace{\frac{I_0 R_2}_{R_1 + R_2}}_{SP(p)}$
On détermine A/CI :

On determine A/CI :

$$i_1(0^+) \stackrel{C.F}{=} 0 = A + \frac{I_0 R_2}{R_1 + R_2} \Rightarrow i_1 = \frac{I_0 R_2}{R_1 + R_2} (1 - e^{-t/\tau})$$

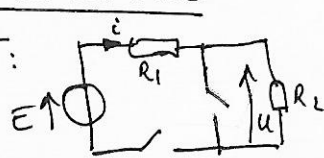
7: ordg de la durée du régime trans.

Requ: $i_{\infty} = \frac{I_0 R_2}{R_1 + R_2}$, se retrouve par
1 div courant: 



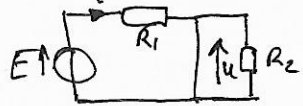
Conditions initiales en élec

Circuit 1 • $t \leq 0^-$:



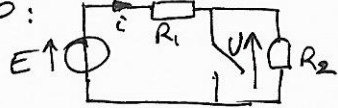
circuit ouvert $\Rightarrow$ courants
tous nuls $\Rightarrow i = 0$
 $u = 0$ (loi
d'ohm en R_2)

• $t = 0^+$: condensateur $\Rightarrow u(0^+) = u(0^-) = 0$



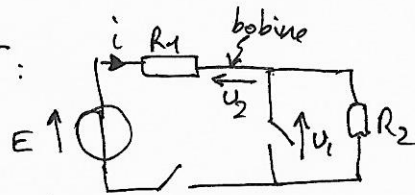
R_2 court circuitée + Parallèle
ou LdR: $E = R_1 i + 0 \Rightarrow i = \frac{E}{R_1}$

• $t \rightarrow \infty$:



Parallèle: $i = \frac{E}{R_1 + R_2}$
DT (ou ohm): $U = \frac{E R_2}{R_1 + R_2}$

Circuit 2 • $t \leq 0^-$:



circuit ouvert, loi
d'ohm $\Rightarrow i = 0$
 $u_1 = 0 = u_2$

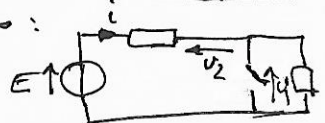
• $t = 0^+$: condensateur: $u_1(0^+) = u_1(0^-) = 0$

bobine: $i(0^+) = i(0^-) = 0$



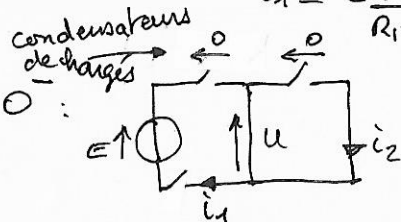
LdR $\Rightarrow u_2(0^+) = E$

• $t \rightarrow \infty$:



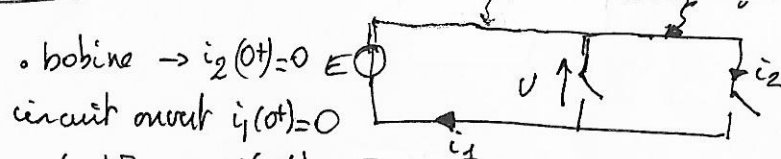
$i = E / (R_1 + R_2)$ (Parallèle)
 $u_2 = 0$
 $u_1 = E \frac{R_2}{R_1 + R_2}$ (DT)

Circuit 3 • $t \leq 0^-$:



circuit ouvert:
 $u = 0$
 $i_1 = i_2 = 0$

• $t = 0^+$: Condensateurs déchargés

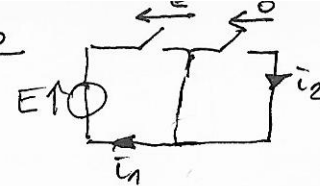


• bobine $\rightarrow i_2(0^+) = 0$

circuit ouvert $i_1(0^+) = 0$

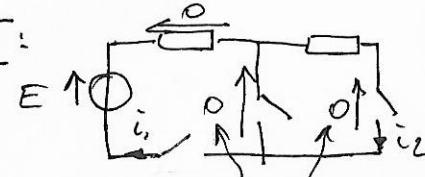
• LdR $\Rightarrow U(0^+) = E$

• $t \rightarrow \infty$



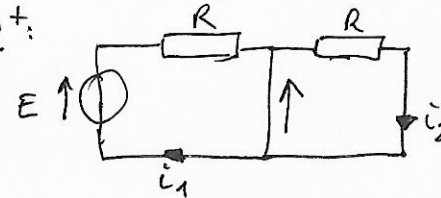
• circuit ouvert $i_1 = i_2 = 0$
• $u = 0$
• 1 des 2 condensateurs est chargé

Circuit 4 • $t \leq 0^-$:



• circuit ouvert
 $i_1 = i_2 = 0$
• $u = 0$

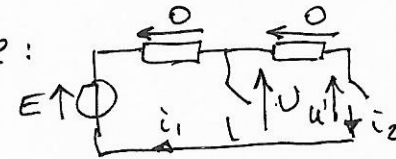
• $t = 0^+$:



• continue dans C de la
tension $\Rightarrow u = 0$
• branche 2 court circuitée
 $\Rightarrow i_2 = 0$

• Parallèle branche 1: $i_1 = \frac{E}{R}$

• $t \rightarrow \infty$:



• circuit ouvert $i_1 = i_2 = 0$
• LdR à gauche: $U = E$
(• LdR à droite: $U' = E$)