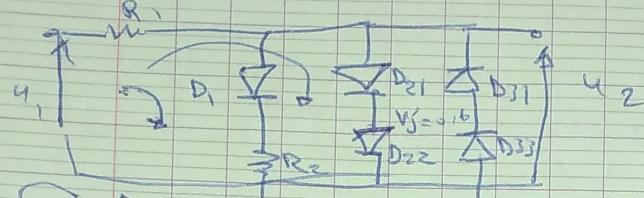


D3: $R_1 = R_2 = 10k$



(H1) $D_m \text{ off} \Rightarrow u_2 = u_1 - R_2 I_{D1} = u_1$

$\text{Si } u_1 < v_j \Rightarrow u_1 \in [0, v_j]$

$\Rightarrow u_2 = f(u_1)$

$-u_1 + v_{D1} = 0 \Rightarrow v_{D1} = u_1 < v_j$

$-u_1 + v_{D21} + v_{D22} = 0 \Rightarrow v_{D21} + v_{D22} = u_1$

$u_1 < 2v_j$

~~(H1)~~ ~~(H2)~~ $D_{1N}, D_{2N}, D_{3N} \text{ off}$

$\text{Si } I_{D1} > 0, v_{D21} < v_j$

Ckt:

$-u_1 + R_1 I_{D1} + v_{D1} + R_2 I_{D1} = 0$

$I_{D1} = \frac{u_1 - v_{D1}}{2R_1} > 0 \quad \checkmark$

$-u_1 + R_1 I_{D1} + 2v_{D21} = 0$

$v_{D21} = \frac{u_1 - R_1 I_{D1}}{2} = u_1 - \frac{u_1 - v_{D1}}{2} = \frac{v_{D1}}{2}$

$v_{D2} = \frac{u_1 + v_{D1}}{4} = \frac{u_1 + v_j}{4} > 0 \Rightarrow$
 $u_1 < 3v_j$

$$\Rightarrow u_1 \in [v_j, 3v_j]$$

H3) $u_1 > 3v_j \Rightarrow u_2 = 2v_j$

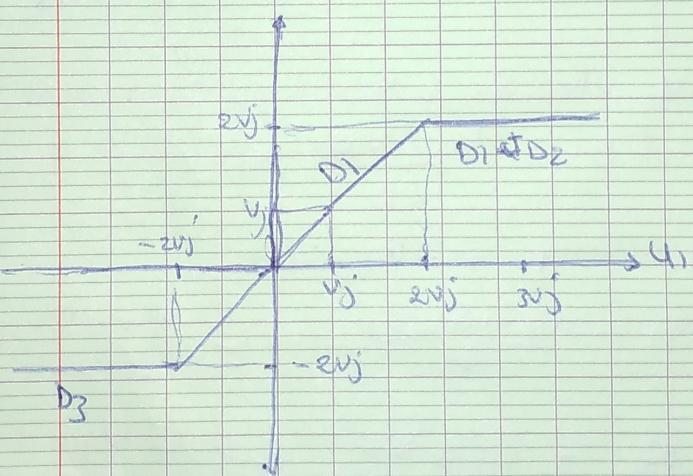
If u : D₃ on, D₁ et D₂ off

$$u_2 = -2v_j \text{ si } I_{D_3} > 0$$

$$\underline{\text{KCL}}_3: u_1 - R_1 I_{D_3} - 2v_j = 0 \Rightarrow$$

$$I_{D_3} = -\frac{u_1 + 2v_j}{R_1}$$

$$\Rightarrow u_1 + 2v_j < 0 \Rightarrow u_1 < -2v_j$$



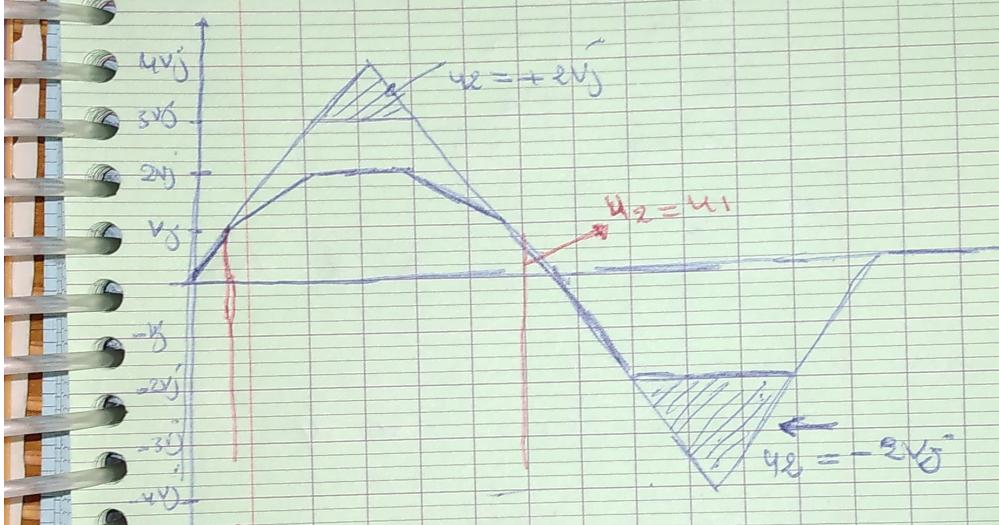
②)

$$u_1 \in [-2v_j + v_j', v_j'] \Rightarrow u_2 = u_1$$

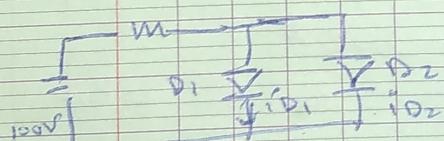
$$u_1 < -2v_j \Rightarrow u_2 = -2v_j$$

$$u_1 \in [v_j, 3v_j'] \Rightarrow u_2 = v_2(u_1 + v_j')$$

$$3v_j' < u_1 \Rightarrow u_2 = 2v_j$$



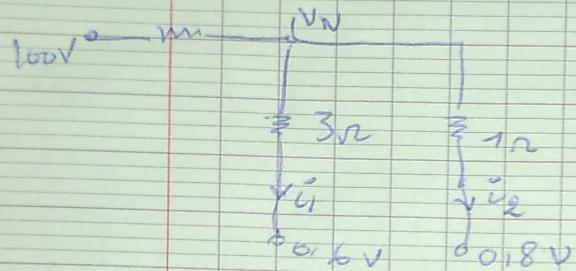
$D_u \subseteq \mathbb{R}^2 \setminus \{(1 \text{ et } 10 \text{ ou } 2)\}$



$$D_1: V_f = 0.6V \quad \text{et} \quad r_{d1} = 3\Omega$$

$$D_2: V_f = 0.8V \quad \text{et} \quad r_{d2} = 1\Omega$$

D'après milliman



$$VN = \frac{\frac{100}{R} + \frac{0.6}{3} + \frac{0.8}{1}}{\frac{1}{R} + \frac{1}{3} + 1}$$

Si $R = 1\text{k}\Omega$

$$VN = \frac{0.1 + 0.2 + 0.8}{0.1001 + 0.333 + 1} = \frac{1.1}{1.4334} = 0.782V$$

$$i_{D1} = \frac{0.82 - 0.6}{3} \approx 0.07A$$

$$i_{D2} = \frac{0.82 - 0.8}{1} = 0.02A$$

Si $R = 10\text{k}\Omega$

$$VN = \frac{0.1 + 0.2 + 0.8}{0.10001 + 0.1333 + 1} = 0.75V$$

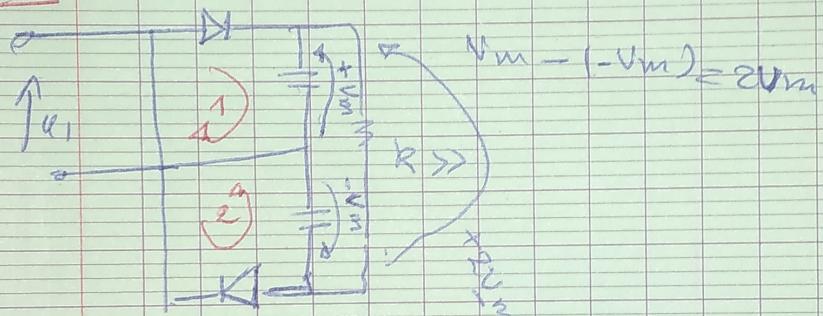
$$i_{D1} = \frac{0.7V - 0.26}{3} = 0.105 A$$

$$U_{D2} = \frac{-0.8}{1} < 0 X$$

H(D1 ON et D2 OFF)

$$i_{D1} = \frac{100 - 0.26}{10000 + 3} = 0.101$$

DS:



$$U_1 = U_m \sin \omega t$$

$$U_2 = 2U_m$$

in circuit

