

LVK: $u_L + \frac{1}{2} i_L = 10$

$$u_L = L \frac{\partial i_L}{\partial t} = 5 \frac{\partial i_L}{\partial t}$$

$$5 \frac{\partial i_L}{\partial t} + \frac{1}{2} i_L = 10$$

$$\Rightarrow \boxed{\frac{\partial i_L}{\partial t} + \frac{1}{10} i_L = 2}$$

$$\boxed{i_L(0) = 2}$$

Resc: Homogener: $\frac{\partial i_L}{\partial t} + \frac{1}{10} i_L = 0 \Rightarrow \lambda + \frac{1}{10} = 0 \Rightarrow \lambda = -\frac{1}{10}$
 ($i_L(0) = 0$)

$$\Rightarrow \underline{i_{L_H} = k_1 e^{-\frac{1}{10}t}}$$

Particuler: $\frac{i_L}{10} = 2 \Rightarrow i_{L_p} = 20$

$$\Rightarrow i_{L_{resc}} = 20 + k_1 e^{-\frac{1}{10}t} \quad i_L(0) = 0 = 20 + k_1 e^0 \Rightarrow k_1 = -20$$

$$\Rightarrow \boxed{i_{L_{resc}} = 20 - 20e^{-\frac{1}{10}t}}$$

Resc: $\frac{\partial i_L}{\partial t} + \frac{1}{10} i_L = 0 \quad (i_L(0) = 2)$

$$\lambda = -\frac{1}{10}$$

$$i_{L_{resc}} = k_1 e^{-\frac{1}{10}t}$$

$$i_L(0) = 2 = k_1 e^0 \Rightarrow k_1 = 2$$

$$\Rightarrow i_{L_{resc}} = 2e^{-\frac{1}{10}t}$$

$$\Rightarrow i_L(t) = i_{L_{resc}} + i_{L_{particuler}}$$

$$i_L(t) = 20 - 20e^{-\frac{1}{10}t} + 2e^{-\frac{1}{10}t} \Rightarrow \boxed{i_L(t) = 20 - 18e^{-\frac{1}{10}t}}$$

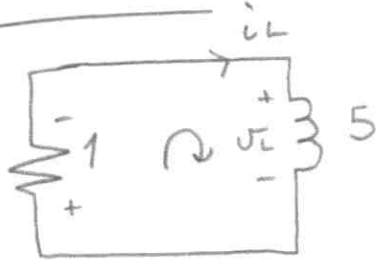
$$0 \leq t \leq 5$$

$$\Rightarrow \boxed{i_L(t=5) = 20 - 18e^{-\frac{1}{2}} \approx 9,08}$$

$$(i_L(t=5) = C_1)$$

Para $t \geq 5$:

$$\Rightarrow i_L + v_L = 0 \quad \text{ses } t' = t - 5$$



$$5 \frac{di_L}{dt'} + i_L = 0$$

$$\frac{di_L}{dt'} + \frac{i_L}{5} = 0 \quad (i_L(t'=0) = C_1)$$

$$\lambda + \frac{1}{5} = 0 \Rightarrow \lambda = -\frac{1}{5}$$

$$\Rightarrow i_L(t') = K_1 e^{-\frac{1}{5}t'} \quad i_L(t'=0) = C_1 = K_1 e^{\overset{0}{\rightarrow} 1}$$

$$\Rightarrow i_L(t') = C_1 e^{-\frac{1}{5}t'}$$

$$\Rightarrow \text{Para } t \geq 5 \quad i_L(t) = (20 - 18e^{-\frac{1}{2}}) e^{-\frac{1}{5}(t-5)}$$

$$i_L(t) = 20e^{-\frac{1}{5}(t-5)} - 18e^{-\frac{t}{5} + \frac{1}{2}}$$

$(t \geq 5)$ $\text{si } t \rightarrow \infty \quad i_L(t) \rightarrow 0$

