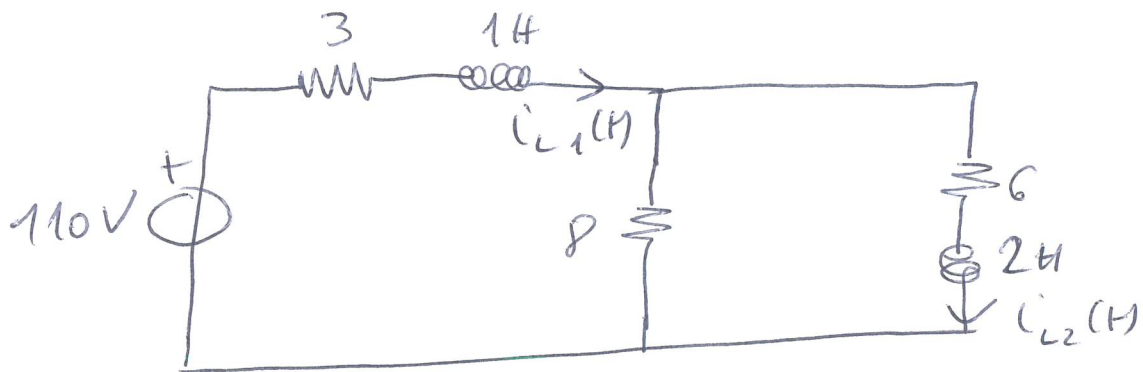


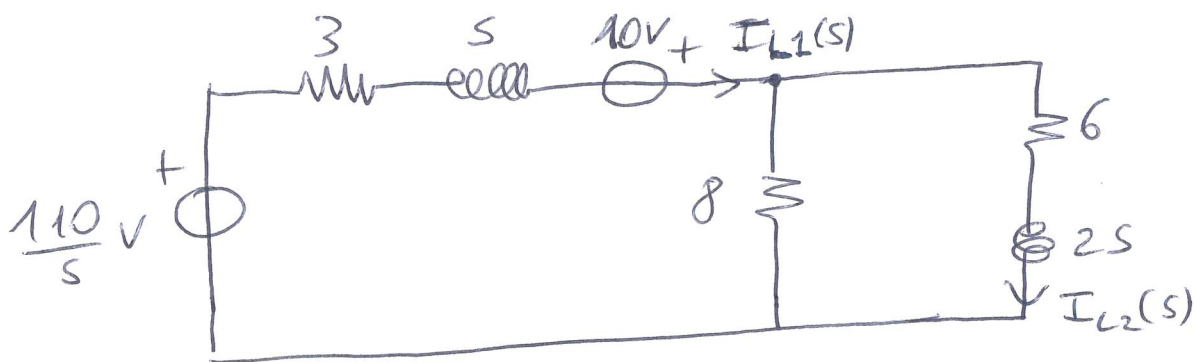
TRANSITORI CON LAPLACE

4)



$$i_{L1}(0) = 10 \text{ A}$$

$$i_{L2}(0) = 0 \text{ A}$$



$$I_1(s) = \frac{10(s+11)(s+7)}{s(s+3)(s+15)} = \frac{154}{9} \frac{1}{s} - \frac{80}{9} \frac{1}{s+3} + \frac{16}{9} \frac{1}{s+15}$$

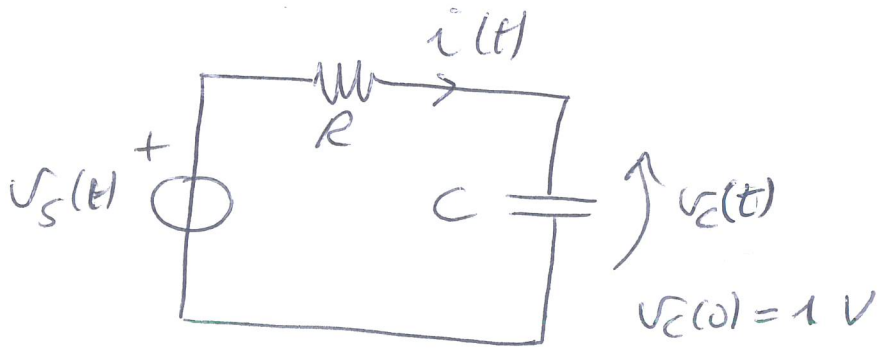
$$i_{L1}(t) = \left[\frac{154}{9} - \frac{80}{9} e^{-3t} + \frac{16}{9} e^{-15t} \right] u(t) \text{ A}$$

$$I_2(s) = \frac{40(s+11)}{s(s+3)(s+15)} = \frac{88}{9} \frac{1}{s} - \frac{80}{9} \frac{1}{s+3} - \frac{8}{9} \frac{1}{s+15}$$

$$i_{L2}(t) = \left[\frac{88}{9} - \frac{80}{9} e^{-3t} - \frac{8}{9} e^{-15t} \right] u(t) \text{ A}$$

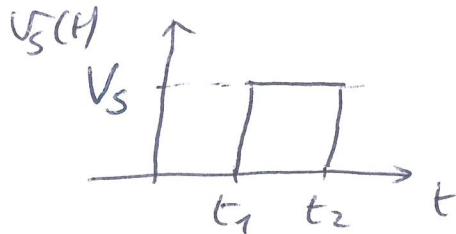
TRANSITORI CON LAPLACE

6) a)



a) $R = 1\Omega$, $C = 10\mu F$

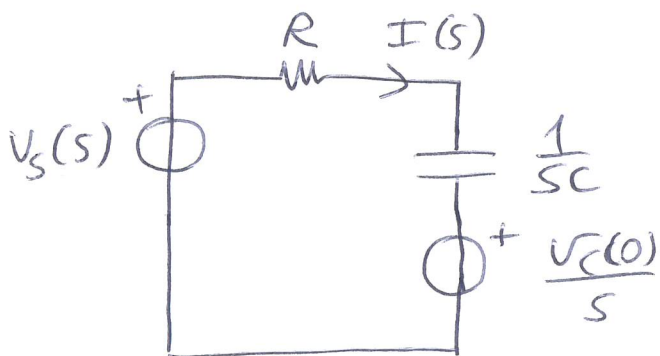
b) $R = 1\Omega$, $C = 0.1\mu F$



$t_1 = 1\mu s$

$t_2 = 2\mu s$

$V_S = 10V$



$$V_S(s) = \frac{V_S}{s} (e^{-st_1} - e^{-st_2})$$

$$\Rightarrow \frac{V_S}{s} (e^{-st_1} - e^{-st_2}) = R I(s) + \frac{1}{sC} I(s) + \frac{V_C(0)}{s}$$

$$I(s) = \frac{V_S}{R} \frac{e^{-st_1} - e^{-st_2}}{s + 1/\tau_c} - \frac{V_C(0)}{R} \frac{1}{1 + 1/\tau_c}$$

$$\tau_c = RC$$

TRANSITORI CON LAPLACE

g) (P)

$$0 < t < t_1: i(t) = -\frac{V_c(0)}{R} e^{-t/\tau_c} \quad A$$

$$t_1 < t < t_2: i(t) = -\frac{V_c(0)}{R} e^{-t/\tau_c} + \frac{V_s}{R} e^{-\frac{t-t_1}{\tau_c}} \quad A$$

$$t > t_2: i(t) = -\frac{V_c(0)}{R} e^{-t/\tau_c} + \frac{V_s}{R} e^{-\frac{t-t_1}{\tau_c}} - \frac{V_s}{R} e^{-\frac{t-t_2}{\tau_c}} \quad A$$

