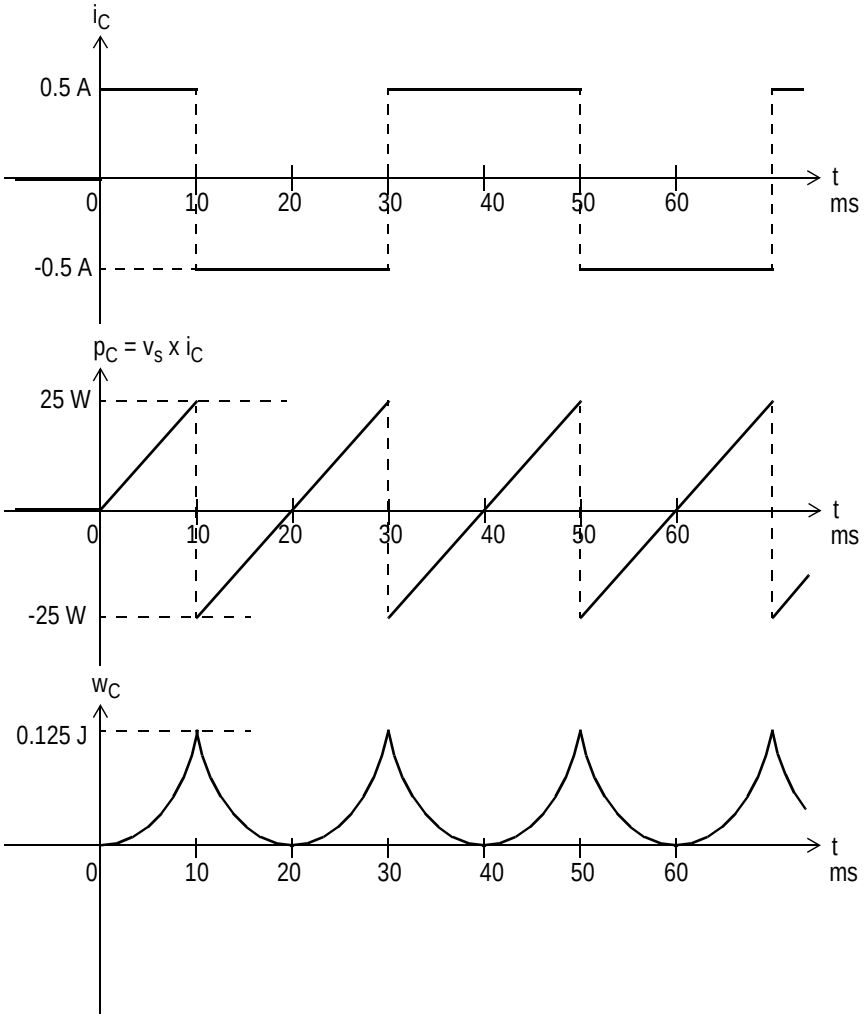
GEl-16132 Circuits

Corrigé du Test no. 1

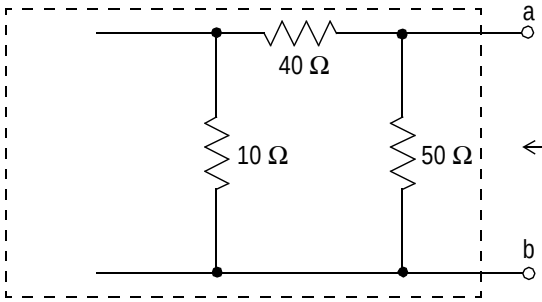
Question no.1



$$w_C = \int_{-\infty}^{t} p_C dt$$

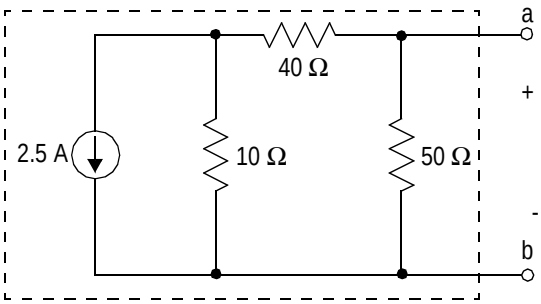
Question no.2

Calcul de R_T:



$$\leftarrow R_T = \frac{50 \times (40 + 10)}{50 + (40 + 10)} = 25\Omega$$

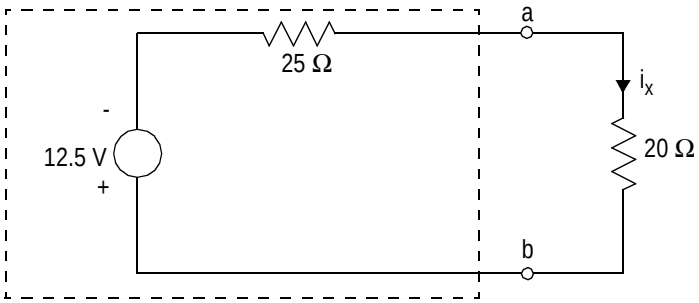
Calcul de V_T:



$$V_T = -50 \times \frac{10}{10 + 50 + 40} \times 2.5 = -12.5\,\text{V}$$

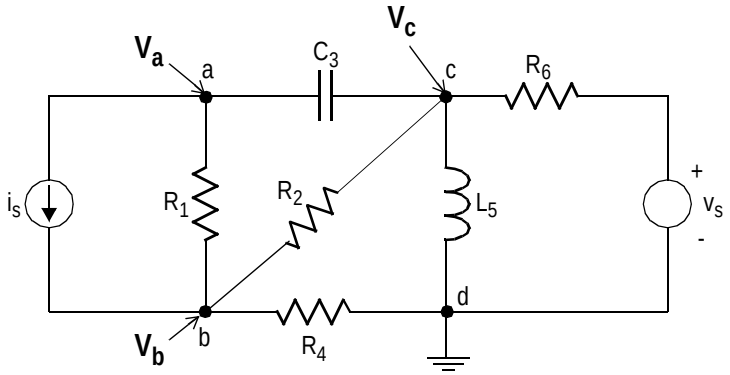
(par la loi du diviseur de courant)

Circuit équivalent:



$$i_x = \frac{-12.5}{25 + 20} = -0.278\text{A}$$

Question no.3



Équations d'équilibre du circuit (forme matricielle) en utilisant la méthode des noeuds:

$$\begin{bmatrix} \frac{1}{R_1} + C_3\frac{d}{dt} & -\frac{1}{R_1} & -C_3\frac{d}{dt} \\ -\frac{1}{R_1} & \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_4} & -\frac{1}{R_2} \\ -C_3\frac{d}{dt} & -\frac{1}{R_2} & C_3\frac{d}{dt} + \frac{1}{R_2} + \frac{1}{R_6} + \frac{1}{L_5}\int dt \end{bmatrix} \begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} = \begin{bmatrix} -i_s \\ i_s \\ \frac{v_s}{R_6} \end{bmatrix}$$