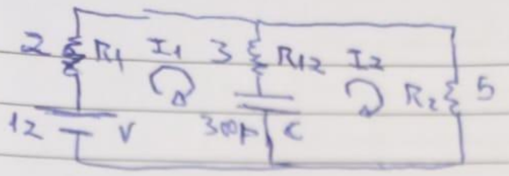

$$i = \dot{Q}$$
$$i = C\dot{v}$$
$$I = sCV$$

Initial voltage equal to zero in the capacitor

$$\begin{cases} R_1 I_1 + R_{12}(I_1 - I_2) + \frac{1}{sC}(I_1 - I_2) = 12 \\ R_{12}(I_2 - I_1) + \frac{1}{sC}(I_2 - I_1) + R_2 I_2 = 0 \end{cases}$$

$$\begin{cases} R_1 I_1 + \left(R_{12} + \frac{1}{sC}\right)(I_1 - I_2) = 12 \\ -\left(R_{12} + \frac{1}{sC}\right)(I_1 - I_2) + R_2 I_2 = 0 \end{cases}$$

$$\left(R_1 + R_{12} + \frac{1}{sC}\right) I_1 - \left(R_{12} + \frac{1}{sC}\right) I_2 = 12$$
$$-\left(R_{12} + \frac{1}{sC}\right) I_1 + \left(R_2 + R_{12} + \frac{1}{sC}\right) I_2 = 0$$

$$\begin{bmatrix} R_1 + R_{12} + \frac{1}{sC} & -\left(R_{12} + \frac{1}{sC}\right) \\ -\left(R_{12} + \frac{1}{sC}\right) & R_2 + R_{12} + \frac{1}{sC} \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} 12 \\ 0 \end{bmatrix}$$

Wolfram's solution (I left it to C, because it's small and inconvenient):

$$I_1(s) = \frac{96Cs + 12}{31Cs + 7} \rightsquigarrow i_1(t) = \frac{-300\, e^{-7t/31C}}{961C}, \quad C, t > 0$$

$$I_2(s) = \frac{36Cs + 12}{31Cs + 7} \rightsquigarrow i_2 = \frac{120\, e^{-7t/31C}}{961C}, \quad C, t > 0$$

Problems with this solution (differ from the method using resolving EDO directly):

- If I put to include t = 0, a Dirac delta appears in the currents
- For t → ∞, I expected the two currents to be equal
- For infinite t the two currents n can be zero.
- And it also happened that the current i1 is negative, but it must be positive;