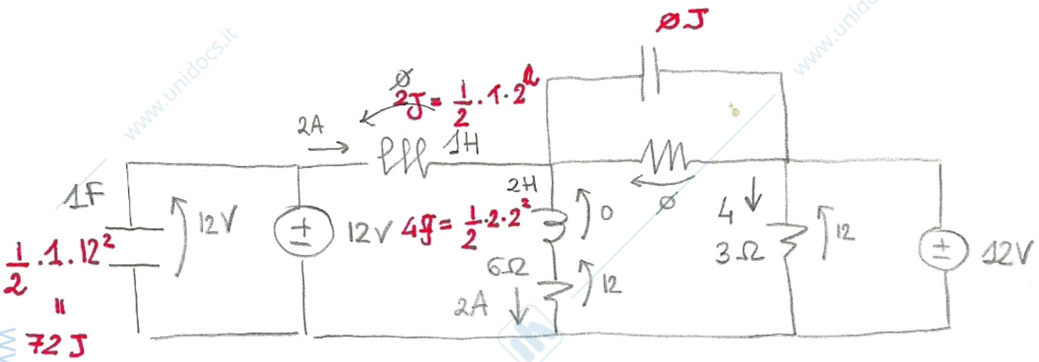
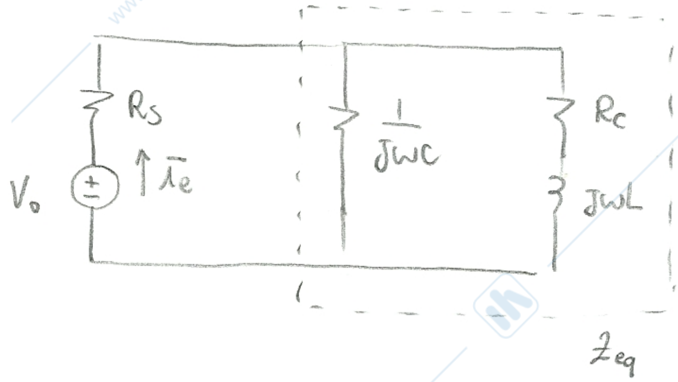


$$P_a^R = 24\,W + \emptyset\,W + \frac{144}{3}W = (24+48)\,W = 72\,W$$

$$P_e^E = 12\cdot 2 + 12\cdot 4 = 12\cdot 6 = 72\,W$$



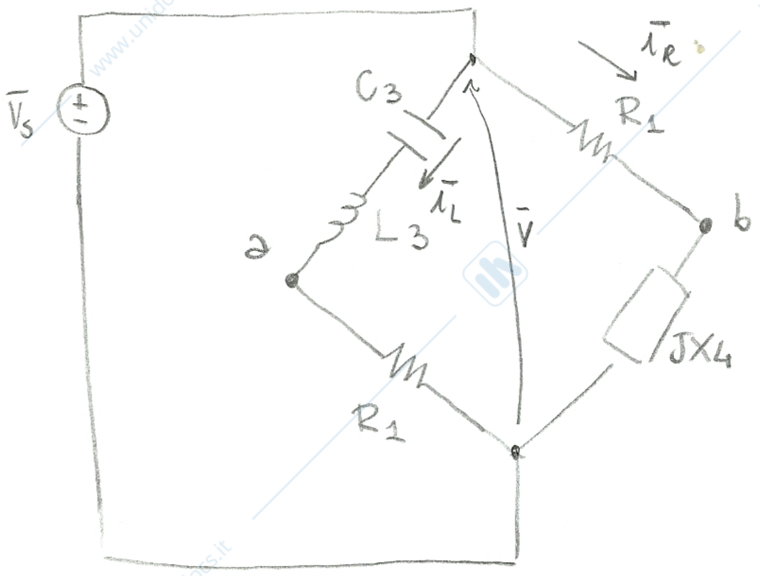
$$\bar{i}_e = \frac{V_0}{R_s + Z_{eq}}$$

$$Z_{eq} = \frac{1}{j\omega C + \frac{1}{R_c + j\omega L}} = \frac{R_c + j\omega L}{(1-\omega^2 LC) + j\omega R_c C}$$

$$\bar{i}_e = \frac{V_0}{R_s + \frac{R_c + j\omega L}{(1-\omega^2 LC) + j\omega R_c C}} = \frac{V_0\left[(1-\omega^2 LC) + j\omega R_c C\right]}{\left[(1-\omega^2 LC)R_s + R_c\right] + j\omega(L + CR_sR_c)}$$

$$i_e(t) = \underbrace{\frac{V_0}{\left[(1-\omega^2 LC)R_s + R_c\right]^2 + \omega^2(L + CR_sR_c)^2}}_{k} \cdot \mathrm{Re}\left\{\left[(1-\omega^2 LC) + j\omega R_c C\right]\cdot\left(\left[(1-\omega^2 LC)R_s + R_c\right] - j\omega(L + CR_sR_c)\right)e^{j\omega t}\right\}$$

$$= k\left[(1-\omega^2 LC)\left[(1-\omega^2 LC)R_s + R_c\right]\cos\omega t + \omega^2 R_c C(L + CR_sR_c)\cos\omega t + \left[(1-\omega^2 LC)R_c + R_c\right]\omega R_c C \,\mathrm{sen}\,\omega t + (1-\omega^2 LC)\omega(L + CR_sR_c)\,\mathrm{sen}\,\omega t\right.$$



$\bar{V}_{ab} \longrightarrow$ e poi $\bar{V}_{ab}(jX_4) \overset{?}{\doteq} 0$

$$\bar{V} = \bar{i}_L \left(\frac{1}{j\omega C_3} + j\omega L_3 + R_1 \right) = \bar{i}_R \left(R_1 + jX_4 \right) = \bar{V}_s$$

$$\bar{i}_L R_1 = \bar{i}_R \, jX_4 \qquad (\bar{V}_{ab} \equiv 0)$$

$$\begin{cases} \bar{V}_s = (R_1 + jX_4)\,\bar{i}_R \\ \bar{V}_s = \left(\frac{1}{j\omega C_3} + j\omega L_3 + R_1 \right) i_L \\ \bar{i}_L = \bar{i}_R \, j\frac{X_4}{R_1} \end{cases}$$

$$\frac{(R_1 + jX_4)\,\cancel{\bar{i}_R}}{\left(\frac{1}{j\omega C_3} + j\omega L_3 + R_1 \right) j\frac{X_4}{R_1}\,\cancel{\bar{i}_R}} = 1$$

$$R_1 + jX_4 = j\frac{X_4}{R_1} \left(\frac{1}{j\omega C_3} + j\omega L_3 + R_1 \right)$$

$$R_1 + jX_4 = j\frac{X_4}{R_1}\left(\frac{1}{j\omega C_3} + j\omega L_3 + R_1\right)$$

$$R_1 + \cancel{jX_4} = \frac{X_4}{R_1\omega C_3} - \frac{\omega L_3 X_4}{R_1} + \cancel{j X_4}$$

$$R_1 = X_4\left(\frac{1}{R_1\omega C_3} - \frac{\omega L_3}{R_1}\right) \qquad \omega \neq \sqrt{\frac{1}{L_3 C_3}}$$

$$X_4 = R_1\,\frac{\omega R_1 C_3}{1-\omega^2 L_3 C_3} = \frac{\omega R_1^2 C_3}{1-\omega^2 L_3 C_3}$$

$$T = 2000 \qquad \omega = \frac{2\pi}{2000}$$

$$X_4 = \frac{\pi}{1000}\cdot\frac{10^4\cdot 4.7\cdot 10^{-6}}{1-\left(\frac{\pi}{1000}\right)^2 0.098\cdot 4.7\,10^{-6}} =$$

$$= \frac{\pi}{1000}\cdot\frac{4.7\;10^{-2}}{1-\frac{\pi^2}{\cancel{10^6}}\cancel{\cdot 10^{-6}}\,4.7\cdot 0.098} = -41.641\ \mu\Omega$$

$$=$$