

$$E_1(t) = 200 \sin(\omega t + \frac{\pi}{2}) \text{ V}$$

$$= 200 \cos(\omega t) \text{ V}$$

$$J_2(t) = 0.6 \cos(\omega t) \text{ A}$$

$$\omega = 100 \text{ rad/s} \quad Q: P_{R_2}^a = ?$$

$$R_1 = 130 \, \Omega$$

$$R_2 = 170 \, \Omega$$

$$L = 0.9 \text{ H}$$

$$C = 120 \, \mu\text{F}$$

(a) Trasformo col metodo dei fasori

$$A \quad \dot{Z}_{R_1} = 130 \, \Omega$$

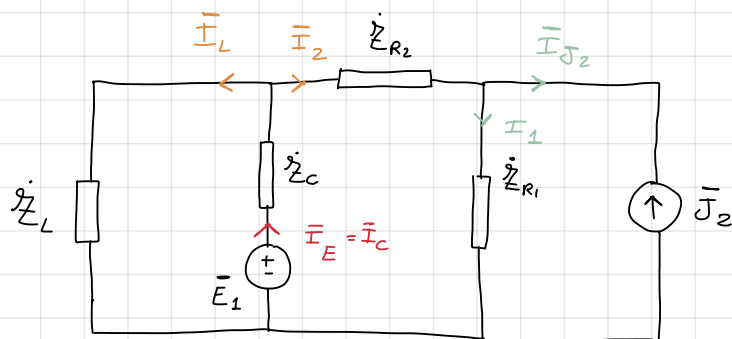
$$B \quad \dot{Z}_{R_2} = 170 \, \Omega$$

$$D \quad \dot{Z}_L = j\omega L = j \cdot 100 \cdot 0.9 = 90j \, \Omega$$

$$C \quad \dot{Z}_C = -\frac{j}{\omega C} = -\frac{j}{100 \cdot 120 \cdot 10^{-6}} \, \Omega = -\frac{1}{12} j = -83.33j \, \Omega$$

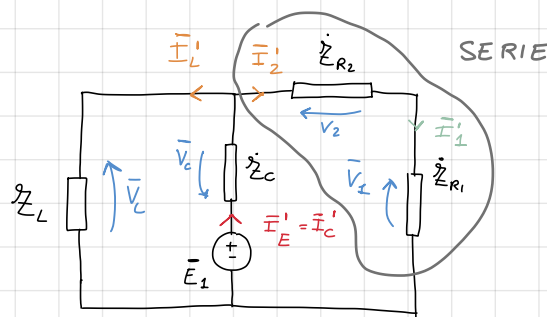
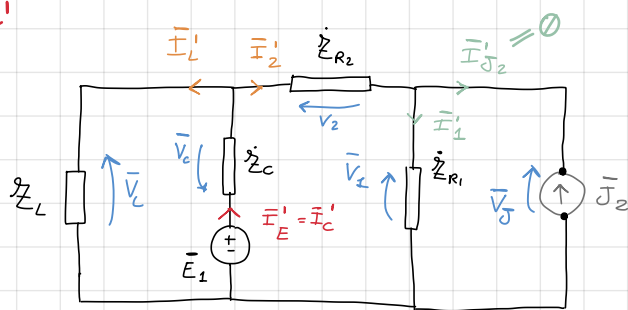
$$E_1 = 200 \cos(\omega t) \Leftrightarrow \bar{E}_1 = 200 e^{j0} = 200 \text{ V}$$

$$J_2 = 0.6 \cos(\omega t) \Leftrightarrow \bar{J}_2 = 0.6 \text{ A}$$



(b) Sovrapposizione

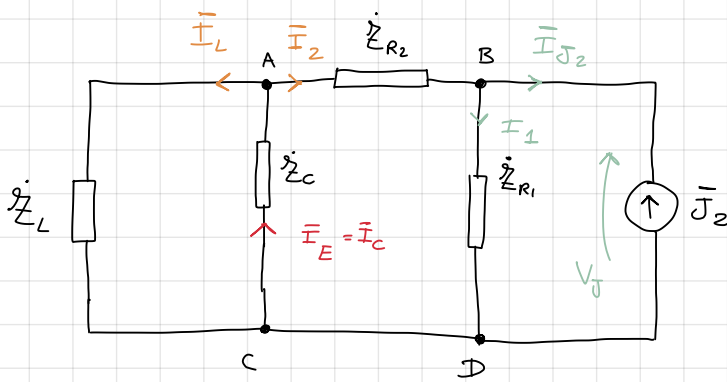
C'



$$\rightarrow \dot{Z}_{12} = \dot{Z}_{R_1} + \dot{Z}_{R_2} ; \quad \dot{Z}_x = \dot{Z}_L \parallel \dot{Z}_{12} ; \quad \dot{Z}_{eq} = \dot{Z}_C + \dot{Z}_x = 24.7 - 0.76j$$

$$\Rightarrow \bar{I}_E = \frac{\bar{E}}{\dot{Z}_{eq}} = 8.066 + 0.25j \text{ A}$$

$$\Rightarrow \bar{I}_2 = \bar{I}_E \cdot \frac{\dot{Z}_L}{\dot{Z}_L + (\dot{Z}_{R_1} + \dot{Z}_{R_2})} = 0.6 + 2.24j \text{ A}$$



$$\dot{Z}_{eq} = \left[(\dot{Z}_L + \dot{Z}_C) + Z_{R2} \right] \parallel R_{R1}$$

$$= 126.26 - 14.025j$$

F

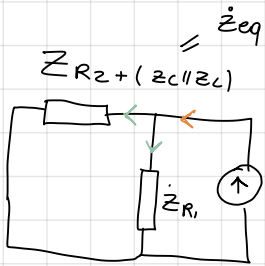
$$\Rightarrow \bar{V}_J = \dot{Z}_{eq} \cdot \bar{J}_2 = 75.76 - 8.42j \text{ A}$$

(INUTILE)

$$\bar{I}_2''$$

F

$$\bar{I}_2 = -\bar{J}_2 \cdot \frac{\dot{Z}_{eq}}{\dot{Z}_{eq} + \dot{Z}_1} = -0.58 + 0.065j \text{ A}$$



$$\Rightarrow \bar{I}_2 = \bar{I}_2' + \bar{I}_2'' = 0.015 + 2.31j \text{ A}$$

$\bar{I}_2 \rightarrow E$

$$\Rightarrow P_{R2}^a = \frac{1}{2} R_2 |\bar{I}_2|^2 = 453.59 \text{ W}$$

$$z = a + jb$$

$$|z|^2 = \left(\sqrt{a^2 + b^2} \right)^2 = a^2 + b^2$$