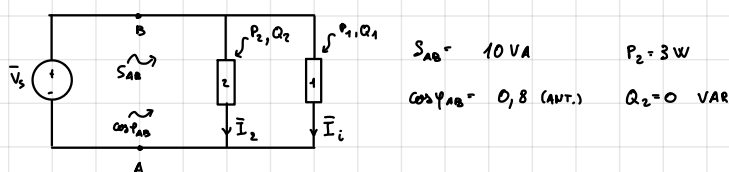
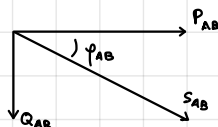


ESERCITAZIONE

ESERCIZIO 1



1) $Q_{AB}?$ $P_{AB} = |S_{AB}| \cos \varphi_{AB} = \dots = 8 \text{ W}$
 $Q_{AB} = |S_{AB}| \sin(-\arccos(\cos \varphi_{AB})) = -6 \text{ VAR}$

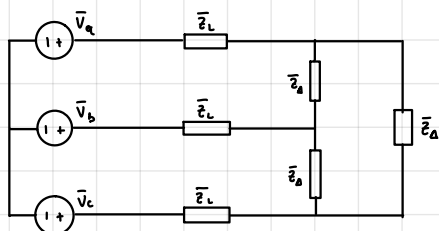


2) $P_1?$ $Q_1?$ Applicando Pothof alla rete AB
 3)

$$\begin{cases} P_{AB} = P_1 + P_2 \rightarrow P_1 = \dots = 5 \text{ W} \\ Q_{AB} = Q_1 + Q_2 \rightarrow Q_1 = \dots = -6 \text{ VAR} \end{cases}$$

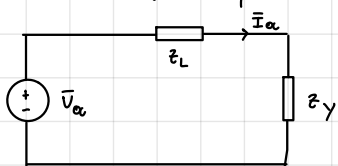
4) $Q_1 < 0 \Rightarrow 1$ è resistivo-capacitivo

ESERCIZIO 2



$V_L = 390 \text{ V}$ $P_d?$
 $\bar{Z}_L = 3 + j3 \Omega$ $I_{fA}?$
 $\bar{Z}_L = 1 \Omega$

Trasformiamo il carico da Δ a $Y \rightarrow Z_Y = \frac{Z_\Delta}{3} = 1 + j$
 Studiamo il monofase equivalente:



$$\bar{I}_a = \frac{\bar{V}_\phi}{Z_L + Z_Y} = \frac{\bar{V}_\phi}{\sqrt{3}(Z_L + Z_Y)} = \dots = 38.12 e^{-j26.57^\circ} \text{ A}$$

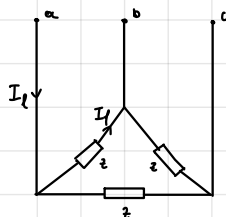
$$\bar{V}_\phi = \frac{V_L}{\sqrt{3}}$$

$$3 \cdot V_\phi \cdot I_L = 3 \cdot R_e(Z) I_L \cdot I_L$$

$$P_d = 3 \cdot R_e(Z_L) \cdot I_L^2 = 3 \cdot 1 \cdot 38.12^2 = 28.9 \text{ KW}$$

$$I_L = \sqrt{3} I_{fA} \Rightarrow I_{fA} = \frac{I_L}{\sqrt{3}} = \dots = 56.61 \text{ A}$$

ESERCIZIO 3



$I_L = 10 \text{ A rms}$ Z res. ind.
 $S = 5.37 \text{ VA}$
 $P = 4.8 \text{ KW}$

positivo perché Z è resistivo

1) $Q?$ $\bar{S} = P + jQ \rightarrow S = \sqrt{P^2 + Q^2} \Rightarrow Q = \sqrt{S^2 - P^2} = \dots = 2.41 \text{ KVAR}$

2) $\cos \varphi = \frac{P}{|S|} = \dots = 0.89 \text{ rit}$

3) $\bar{I}_e?$ $\bar{I}_e = \sqrt{3} I_L = \sqrt{3} \cdot 10 \text{ A} = 17.32 \text{ A eff}$

4) $\bar{V}_L?$ Convertiamo a Y : $Z_Y = \frac{Z}{3}$ Per ogni fase $S_{af} = \frac{S}{3} \rightarrow |S_{af}| = |I_L| |V_{p1}| \Rightarrow |V_{p1}| = \frac{|S_{af}|}{|I_L|} = 103.3 \text{ V eff}$
 $|V_L| = \sqrt{3} |V_{p1}| = \dots = 179 \text{ V eff}$

5) $Z?$ $P_A = \frac{P}{3}$, $Q_A = \frac{Q}{3} \rightarrow P_A = \dots = 1.6 \text{ KW}$, $Q_A = \dots = 0.8 \text{ KVAR} \rightarrow \bar{S}_1 = P + jQ = \frac{V_L^2}{Z^*} \Rightarrow Z^* = \frac{179}{(1.6 + j0.8) \cdot 10^3} = 16 - j8 \Omega$
 $Z = 16 + j8 \Omega$