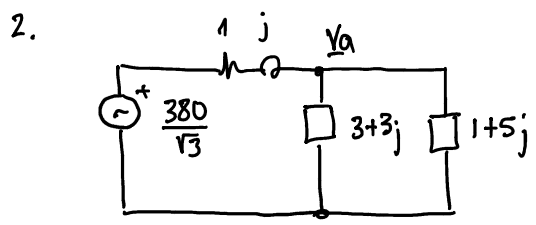


$\underline{V}_{abg} = 380 \angle 30^\circ$   
 $(A_1) = 32'85 = I_1$   
 $\cos \varphi_1 = 0'707$   
 $S_1 = 13764'5 \text{ VA}$   
 $\hat{Z}_2 = 1+5j \Omega$

1.  $\hat{S}_1 = 13764'5 \angle 45^\circ \text{ VA}$  porque  $\varphi_1 = \alpha \cos 0'707$   
 $\hat{S}_1 = 9733 + 9733j \text{ VA}$ .

$\lambda \hat{S}_1 = 3 \cdot I_1^2 \cdot \hat{Z}_1 \rightarrow \hat{Z}_1 = \frac{13764'5 \angle 45^\circ}{3 \cdot 32'85^2} = 4'25 \angle 45^\circ = 3+3j$

Juego  $\hat{Z}_{1\Delta} = 9+9j \Omega$



$(3+3j) \parallel (1+5j) = 2'42 \angle 60'26^\circ$

Juego  $I = \frac{380/\sqrt{3}}{2'42 \angle 60'26^\circ + 1j} = 57'7 \angle -54'64^\circ \text{ A}$

$\underline{V}_a = I \cdot \hat{Z}_2 = 57'7 \angle -54'64^\circ \cdot 2'42 \angle 60'26^\circ = 139'67 \angle 5'6^\circ \text{ V}$

Entonces  $\underline{V}_{F1} = \underline{V}_{ab} = 241'9 \angle 35'65^\circ \text{ V}$

3. Habiendo calculado el paralelo entre las dos impedancias por fase de las cargas, se puede saber que  $\cos \varphi_{12} = \cos 60'26 = 0'496$  inductivo

4. Para calcular la capacidad es necesario conocer la potencia activa consumida por las dos cargas,  $P_{12}$ .

$\hat{S}_{12} = 3 \underline{V}_a \underline{I}^* = 3 \cdot 139'67 \angle 5'6^\circ \cdot 57'7 \angle 54'64^\circ = 24176'9 \angle 60'24^\circ = 12000 + 21000j \text{ VA}$

Entonces  $C_Y = \frac{12000}{3} \frac{\tan 60'26 - \tan 36'9}{139'67^2 \cdot 100n} = 652'4 \mu\text{F} \rightarrow \hat{Z}_Y = -4'88j \Omega$

$\cos \varphi'_{12} = 0'8 ; \varphi'_{12} = 36'9$

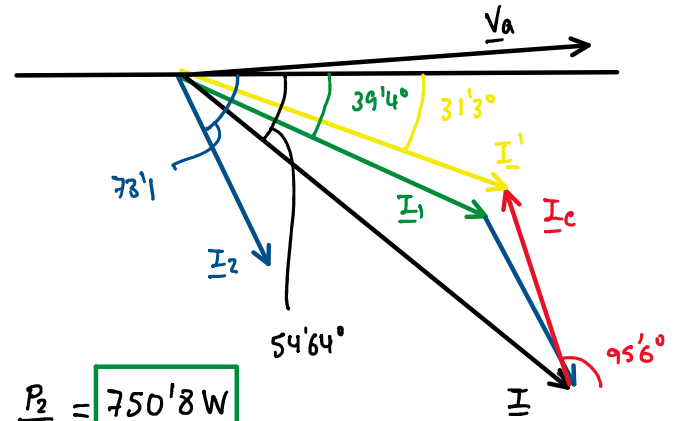
5.  $P_{12} = P_{12}' = 3 \cdot V_a I' \cos \varphi_n'$  ;  $12000 = 3 \cdot 139'67 \cdot I' \cdot 0'8$  ;  $I' = 35'8 \text{ A}$

$\varphi' = \varphi_n - \varphi_i'$  ;  $36'9 = 5'6 - \varphi_i'$  ;  $\varphi_i' = -31'3^\circ$  luego  $I' = 35'8 \angle -31'3^\circ$   ~~$\times 57'72 - 54'64^\circ$~~

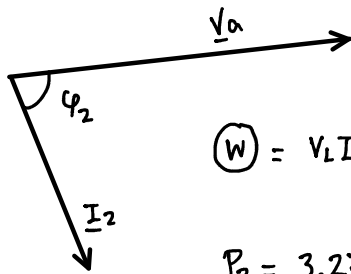
$I_c = \frac{139'67 \angle 5'6}{-4'88j} = 28'6 \angle 95'6^\circ \text{ A}$

$I_1 = \frac{139'67 \angle 5'6}{3+3j} = 32'9 \angle -39'4^\circ \text{ A}$

$I_2 = \frac{139'67 \angle 5'6}{1+5j} = 27'4 \angle -73'1^\circ \text{ A}$



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$(W) = V_L I_L \cos \varphi = \frac{P_2}{3} = 750'8 \text{ W}$

$P_2 = 3 \cdot 27'4^2 \cdot 1 = 2252'3 \text{ W}$

