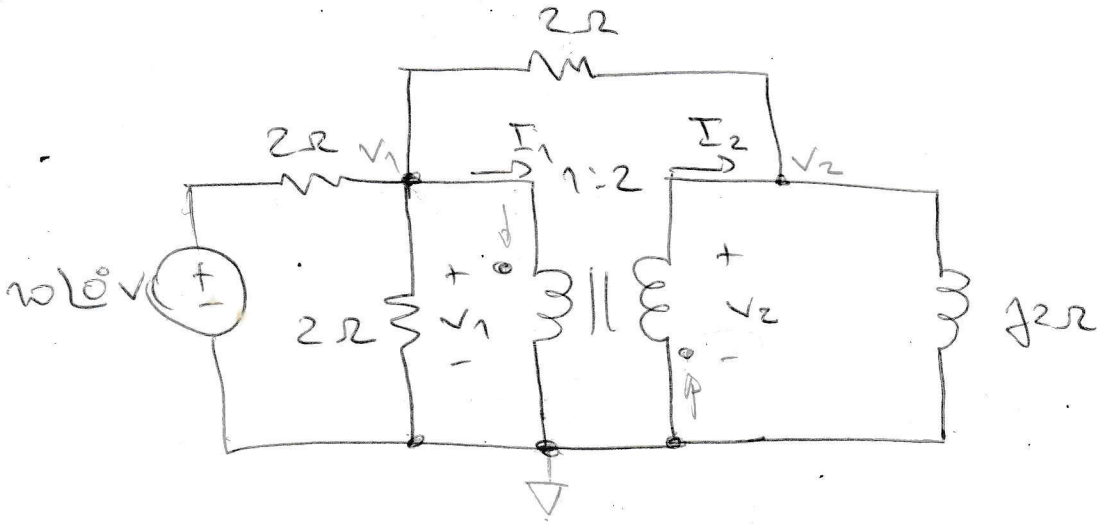
Determine I_1, I_2, V_1 e V_2.



$$\frac{V_2}{V_1} = -2 \quad (1) \qquad \frac{I_2}{I_1} = -\frac{1}{2} \quad (2)$$

A malha m1:

$$\frac{V_1 - 10\angle 0°}{2} + \frac{V_1}{2} + I_1 + \frac{V_1 - V_2}{2} = 0 \quad (3)$$

$$V_1 - 10 + V_1 + 2I_1 + V_1 - V_2 = 0$$

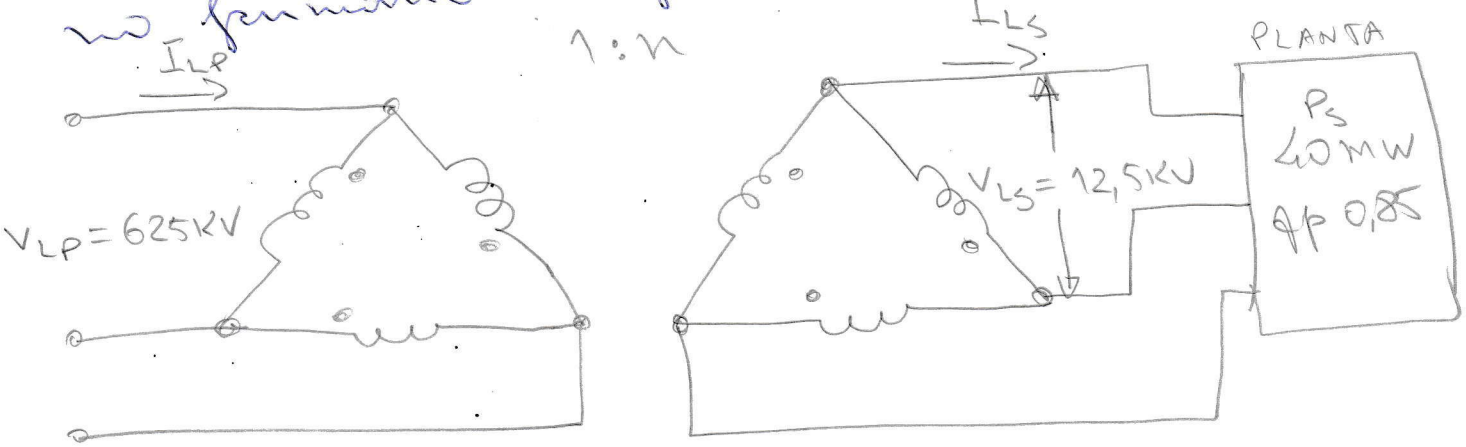
A malha m2:

$$\frac{V_2 - V_1}{2} - I_2 + \frac{V_2}{j2} = 0 \quad (4)$$

$$V_2 - V_1 - 2I_2 - jV_2 = 0$$

$$\begin{cases} I_1 = 3{,}07 \angle -73{,}58° \text{ A} \\ I_2 = 1{,}5 \angle 166{,}42° \text{ A} \\ V_1 = 0{,}85 \angle 25 \text{ V} \\ V_2 = 1{,}7 \angle -160° \text{ V} \end{cases}$$

→ Um transformador Δ-Δ é usado para abaixar a tensão de linha de 625 kV para uma planta (equipamento) de 12,5 kV. A planta solicita 40 MW com fator de potência de 0,85 em atraso. Obter a corrente de linha no primário e potência aparente total.



$$P = S\cos\theta \qquad S = \sqrt{3}\,V_L I_L$$

$$P = \sqrt{3}\,V_L I_L \cos\theta = \sqrt{3}\,V_L I_L\, fp$$

$$I_{Ls} = \frac{P_s}{\sqrt{3}\,V_{Ls}\,fp} = 2173{,}55\,kA$$

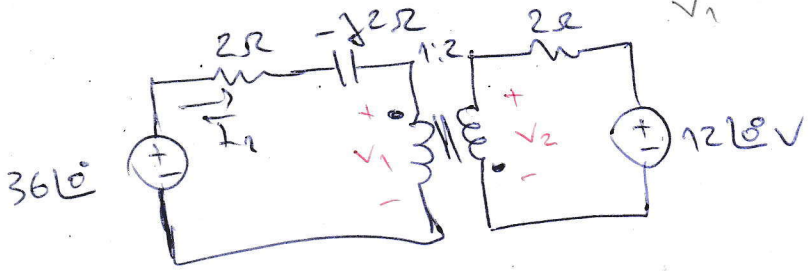
$$\frac{V_{Fs}}{V_{Fp}} = n = \frac{12{,}5\cdot 10^3}{625\cdot 10^3} = 0{,}02 = \frac{1}{50} \quad \text{(RELAÇÃO DE ESPIRAS)}$$

$$I_{Lp} = n\,I_{Ls} = 43{,}47\,kA$$

$$S_T = \sqrt{3}\,V_{Ls}\,I_{Ls} = 47{,}04\,MVA$$

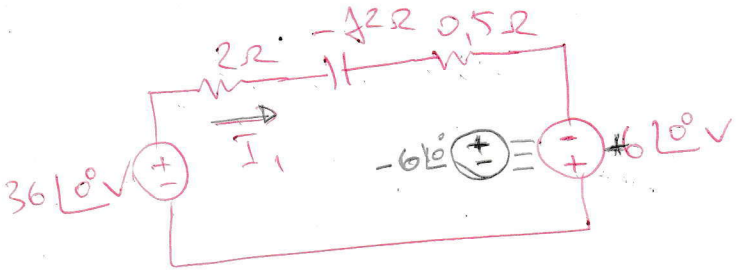
5) Encontre I_1.

$$\frac{V_2'}{V_1'} = -n = -2 \Rightarrow \boxed{V_1' = -\frac{V_2'}{n}}$$

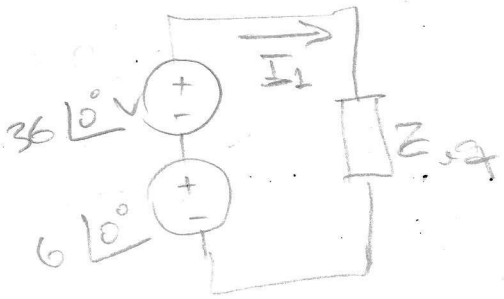


$$n = \frac{2}{1} = 2 \qquad V_1 = \frac{-12\angle 0°}{2} = -6\angle 0°$$

$$Z_{in} = \frac{Z_L}{n^2} = \frac{2}{2^2} = 0{,}5\,\Omega$$



$$I_1 = \frac{36\angle 0° + 6\angle 0°}{2{,}5 - j2} = 13{,}12\angle 38{,}66°\,A$$



$$\frac{V_2'}{V_1'} = \frac{12\angle 0°}{V_1'} = n = 2$$

$$V_1' = -\frac{12\angle 0°}{2} = -6\angle 0°\,V$$