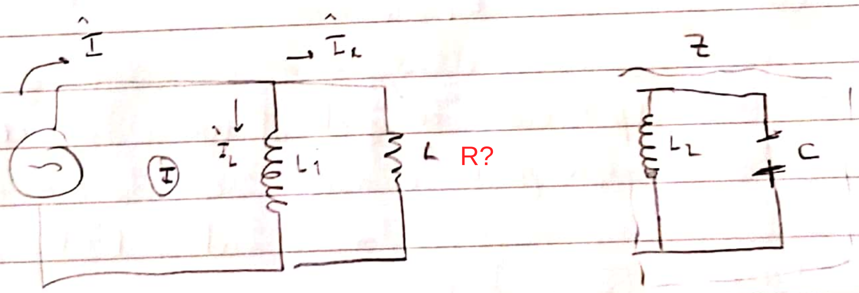
Ej 10



$R = 4,7\ k\Omega$

$\cos\phi = 0,65 \Rightarrow \boxed{\phi = 49,45°}$ El ángulo es negativo, ya que la corriente total atras al voltaje

$f = 1\ MHz \rightarrow 63 \times 10^5\ rad/s$

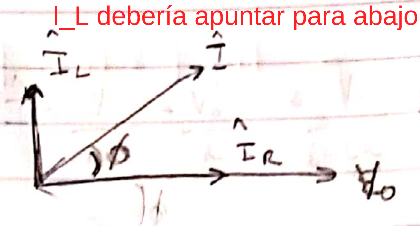
$L_2 = 2L_1$

kirchoff $V_0 - \hat{V}_L \hat{I}_L = 0 \Rightarrow V_0 - i\omega L_1 \hat{I}_L = 0$

Z_L?

- $V_0 - R\hat{I}_R = 0$ | $i\omega L_1 \hat{I}_L - R\hat{I}_R = 0$
- $\hat{I} = \hat{I}_L + \hat{I}_R$

I_L debería apuntar para abajo



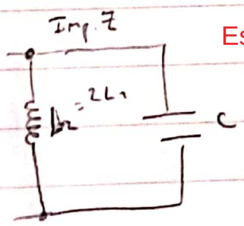
$|\hat{I}| \sin\phi = |\hat{I}_L|$

$|\hat{I}| \cos\phi = |\hat{I}_R|$

$$tg\phi = \frac{|\hat{I}_L|}{|\hat{I}_R|} = \frac{\frac{|V_0|}{|i\omega L_1|}}{\frac{|V_0|}{|R|}} = \frac{R}{\omega L_1}$$

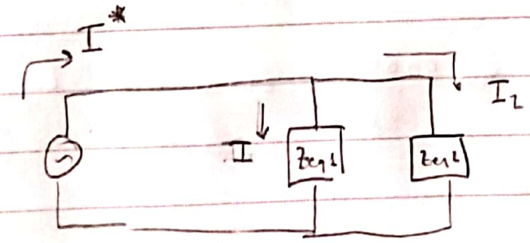
$\Rightarrow \boxed{L_1 = 6{,}4 \times 10^{-4} \text{ Henry}}$

$$\frac{1}{Z_{eq_1}} = \frac{1}{R} + \frac{1}{i\omega L_1} \Rightarrow \frac{1}{Z_{eq_1}} = \frac{i\omega L_1 + R}{iR\omega L_1} \Rightarrow \boxed{Z_{eq_1} = \frac{iR\omega L_1}{i\omega L_1 + R}}$$



Esta Z debería estar sumada en paralelo como antes

$$Z = 2L_1\omega i - \frac{i}{\omega C} \Rightarrow \boxed{Z_{eq_2} = i\left(2L_1\omega - \frac{1}{\omega C}\right)}$$



$\boxed{\hat{I}^* = \hat{I} + \hat{I}_2}$

corriente circuito original

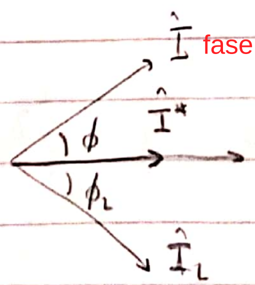
① $V_0 - Z_{eq1}\hat{I} = 0$

$\boxed{\cos\varphi = 1} \Rightarrow \boxed{\varphi = 0}$ $\Rightarrow \boxed{|\hat{I}| = \frac{V_0}{|Z_{eq_1}|}}$

② Malla exterior

$V_0 - \hat{I}_2 Z_{eq2} = 0$

$\Rightarrow |\hat{I}_2| = \frac{V_0}{|Z_{eq_2}|}$



fase negativa

$|\phi| = |\phi_2|$

$\hat{I}^*$ es puramente real porque $\varphi = 0$

$$|\hat{I}^*| \cos\varphi = |\hat{I}| \cos\phi + |\hat{I}_2| \cos\phi_2$$

$$\underbrace{|\hat{I}^*| \sin\varphi}_{=0} = |\hat{I}| \sin\phi + |\hat{I}_2| \sin\phi \Rightarrow |\hat{I}| = |\hat{I}_2|$$

y que podés decir de las fases?

$$\Rightarrow \frac{\cancel{V_0}}{|Z_{eq_1}|} = \frac{\cancel{V_0}}{|Z_{eq_2}|} \Rightarrow |Z_{eq_1}| = |Z_{eq_2}|$$

$$\Rightarrow Z_{eq_1} = \frac{iRwL_1}{iwL_1 + R} \cdot \frac{R - iwL_1}{R - iwL_1} = \frac{iR^2wL_1 + Rw^2L_1^2}{R^2 + w^2L_1^2}$$

$$= \boxed{\frac{Rw^2L_1^2}{R^2 + w^2L_1^2} + i\left(\frac{R^2wL_1}{R^2 + w^2L_1^2}\right)}$$

1992,5

$Rw^2L_1^2 = 7{,}64 \times 10^{10}$

$R^2 + w^2L_1^2 = 38347024$

$R^2wL_1 = 8{,}9 \times 10^{10}$

$$\Rightarrow \boxed{Z_{eq_1} = 1992{,}5 + 2322{,}65\,i}$$

$$\boxed{|Z_{eq_1}| = 3060{,}2}$$

$$\Rightarrow |Z_{eq_1}| = |Z_{eq_2}| = 3060{,}2 = \left(2L_1w - \frac{1}{wC}\right)$$

$$\Rightarrow \frac{1}{wC} = 2L_1w - 3060{,}2 = 5063{,}8$$

$$\Rightarrow C =$$