

$$c(0), T_{\max} \text{ min } (I_{\text{ext}} \omega)$$

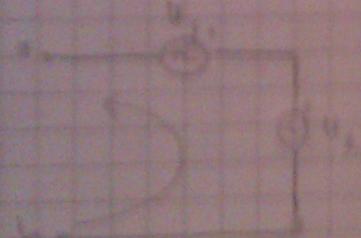
$$c(0) \text{ min } (\lambda + \frac{1}{2} \omega)$$

$$I = I_x + I_y + I_{\text{ext}} + I_{\text{ext}}^2 \quad I_{\text{ext}} = \frac{I_{\max}}{12}$$

$$T = I \ddot{\theta} + \dot{I} \omega^2 = I [\cos(\omega t) - \sin(\omega t)] + I_{\text{ext}} \omega^2 I_y$$

$$L = I \omega + I_y \dot{\theta}$$

$$\omega = \frac{I_y}{I} \dot{\theta}$$



$$U_1(t) = 6.14 \text{ mV} (\sin t + 36.27^\circ)^\eta$$

$$U_2(t) = 3.64 \text{ mV} (\sin t - 29.6^\circ)^\eta$$

$$U_{\text{ext}}, U_{\text{ext}}(t) = U_{\text{ext}} (A - \epsilon_{\text{ext}})$$

$$U_{\text{ext}} = U_1 + U_2 + U_{\text{ext}}$$

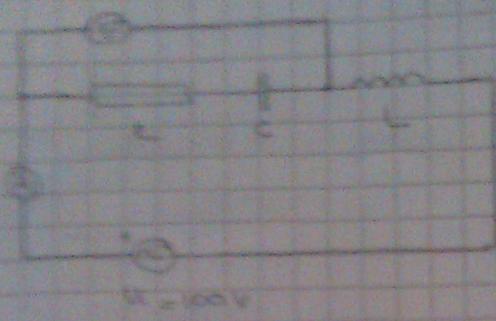
$$U = \frac{U_{\text{ext}}}{4} [(\sin^2 t + 10 \{ \cos(36.27^\circ) + \sin(36.27^\circ) \}) + 14.76]^\eta$$

$$U = 14.76 \text{ mV}$$

$$U = 14.76 \text{ mV} = 14.76 \times 10^{-3} \text{ V} = 14.76 \mu\text{V}$$

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$\omega = 10^3$
 $\omega C = 0.12$

$$U = 100V$$

$$L = 25mH$$

$$C = 80\mu F$$

$$\omega = 10^3 rad/s$$

$$Z = R + jX_L + jX_C$$

$$X_L = j\omega L = j \cdot 10^3 \cdot 25 \cdot 10^{-3} = X_L [90^\circ]$$

$$X_C = \frac{1}{j\omega C} = -j \cdot 10^3 \cdot 80 \cdot 10^{-6} = X_C [-90^\circ]$$

→ paralelo

LETRAISADA

MEDIANA 2

$$Z_{eq} = R + X_L + X_C$$

$$= R + jX_L - jX_C$$

$$= R + j(X_L - X_C) = R + j(\omega L - \frac{1}{\omega C}) = 30 - j40 =$$

$$X_L = 100 \cdot 25 \cdot 10^{-3} \cdot 10^{-2}$$

$$X_C = \frac{1}{100 \cdot 80 \cdot 10^{-6}} = 10\Omega$$

$$F = \frac{1}{50\pi}$$

$$= 50 \angle -90^\circ$$

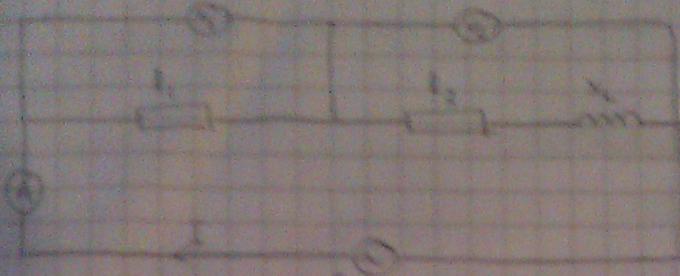
$$Z_{eq} = \frac{j}{R} \cdot \frac{100 \cdot 10^3}{50 \cdot 10^3} = 2 \angle 90^\circ$$

$$= 12 + j16\Omega$$

$$I_A = 2A$$

$$U_{AC} = I (R + jX_C) = 16,6 \angle -99^\circ$$

$$U_{AC} = 16,6 \angle -99^\circ$$



$$U_{11} = U_{12} = 50V$$

$$I_1 = 5A$$

$$I_1 = ?$$

$$I_1 = I_11 + I_12$$

$$U_{11} = U_{12} = 50V \quad \checkmark$$

$$U_{12} = U_{11} + U_{13} \quad \checkmark$$

$$U_{13} = U_{11} - U_{12} \quad \checkmark$$

→ fazes na alternatoru sa
v sile sa zmenia

→ napäť na induktivitej fáze
sa meníva za 90°

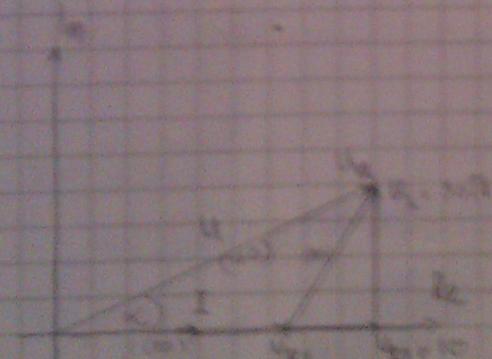
$$U_{11} = U_{12} = U_1 = U_{13} = 50$$

$$R_1 = 10 \Omega \quad \text{and}$$

$$jX_1 = jL_1 = 10 + jU_{11} = j50$$

$$Z_1 = (10 + j50)^2 = 2500 \Omega$$

PERIODICKY

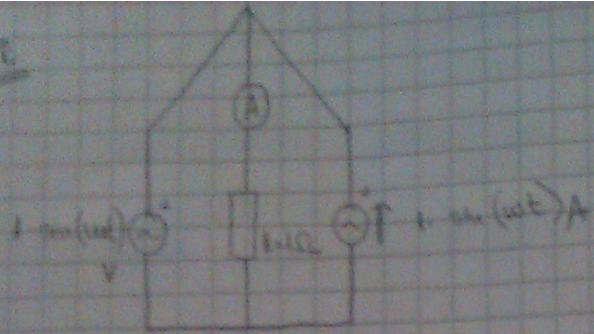


→ preto koniecneho poctku nad X

$$\alpha = 61,61^\circ$$

$$U = 120 \angle 61,61^\circ = 90 + j30\sqrt{3} \quad \checkmark$$

$$I = 2A$$



$$U = \frac{1}{R} I \cdot 180^\circ + 0.99 + 10^\circ$$

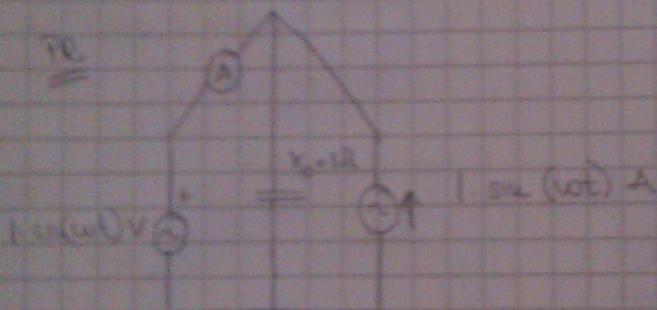
$$I = 0.99410^\circ$$

$$I_A = ?$$

$$1) \quad U - U_L = 0 \quad (\text{KCL superposition})$$

$$U = U_L$$

$$I_A = \frac{U_L}{R} = \frac{0.99410^\circ}{1.0} = 0.99410^\circ$$



$$U = U_L$$

$$I_A = \frac{U}{R} = \frac{0.99410^\circ}{1.0} = 0.99410^\circ \text{ A}$$

$$I_B = 0.99410^\circ$$

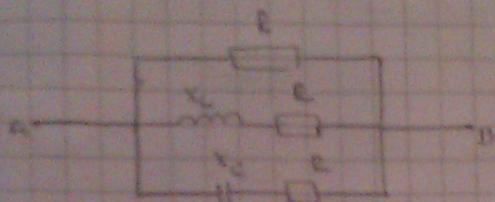
$$I_C = I_A - I_B = 0.99410^\circ - 0.99410^\circ = -0.7 + 0.7$$

$$I_C = 0 \text{ A}$$

\rightarrow ampermetre mijen sangu ikanas, ne i but



$$Z_{eq} = ? \quad 2R + X_L = X_C$$



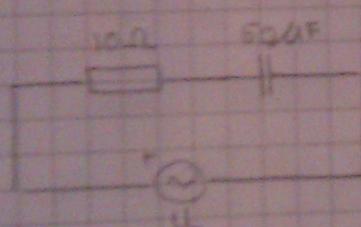
$$\frac{1}{Z} = \frac{1}{R} + \frac{1}{C+jL} + \frac{1}{C-jL} = \frac{1}{R} + \frac{1}{C} + \frac{1}{C} + \frac{1}{C^2+L^2} =$$

$$= \frac{1}{R} + \frac{L^2+L+j^2L}{(C+jL)(C-jL)} = \frac{1}{R} + \frac{jL}{L^2+4CL^2} = \frac{1}{R} + \frac{jL}{4CL^2} =$$

$$= \frac{1}{R} + \frac{1}{5} \cdot \frac{1}{R} = \frac{6+2}{5R} = \frac{8}{5R} = \frac{1}{2}$$

$$Z = \frac{R}{2} \parallel R$$

Q2



$f_1 \rightarrow$ struja prethodi 30°

$f_2 \rightarrow$ struja prethodi 90°

$$\omega = 2\pi f$$

$$I = 10^\circ$$

$$(I = U) e^{j30^\circ}$$

$$I = 10 - j \frac{1}{5000}$$

$$\frac{U}{I} = \frac{j1e^{j30^\circ}}{10^\circ}$$

$$\tan(-30^\circ) = \frac{1}{\frac{U}{I}} = \frac{1}{10(W \cdot 50 \cdot 10^{-6})} \Rightarrow W = 8466,2$$

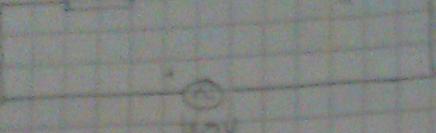
$$-0,577 = \frac{1}{W \cdot 50 \cdot 10^{-6}}$$

$$W \cdot 5 \cdot 10^{-6} = 0,577$$

$$W = 3166,2$$

$$J = 1,8 \cdot 10^{-3} \text{ As}$$

$$U_3 = \frac{1}{2} \Rightarrow J = \frac{1}{400}$$



$$Y_0 = \frac{1}{R} = 10^{-1}$$

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$$Z_0 = R = j0 - 100$$

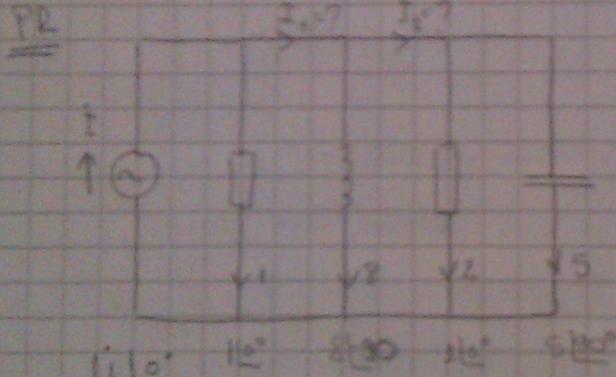
$$t = e^{-j\omega t}$$

$$i = \frac{U}{Z_0} e^{-j\omega t}$$

$$\operatorname{tg}(-63.4^\circ) = \frac{-40}{R}$$

$$R = \frac{-40}{\operatorname{tg}(-63.4^\circ)} = 30 \Omega$$

$$R = 30 \Omega$$



$$\text{per diagonal } \frac{110^\circ}{83.3^\circ}$$

$$I_2 = 1 - j2 = 5.08 A \quad 105.9^\circ$$

$$I_1 = 1 + j5 - j2 = 1 - j3 = 3.6 A \quad -66.30^\circ$$

$$I_{\text{net}} = I_1 + I_2 = 3 - j3 + 5.08 \quad 105^\circ$$

W = 100

pitching stage to 65°

$$I = 10$$

about 2 minutes?

$$L = 10^2$$

W = 100000

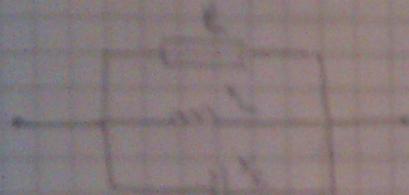
$$F = 10^2 \cdot 10^2 \cdot 10^2 = 10^6$$

do we have enough

2000 - 4000

$$J = 10^2 \times 10$$

so about 1000 N



$$G = \frac{1}{F}$$

$$R_1 = \frac{1}{V_1}$$

$$R_2 = \frac{1}{V_2}$$

had the following
parameters to choose
 (-10) $(+10)$

$$Y = 50000 + 10000$$

$$Y_F = \frac{1}{Y} = \frac{1}{50000 + 10000} = 0.0015 = 10000$$

$$q = 0.0015 \times L = \frac{1}{9} = 11.11$$

$$R_1 = 0.0015 \times V_1 = 10000$$