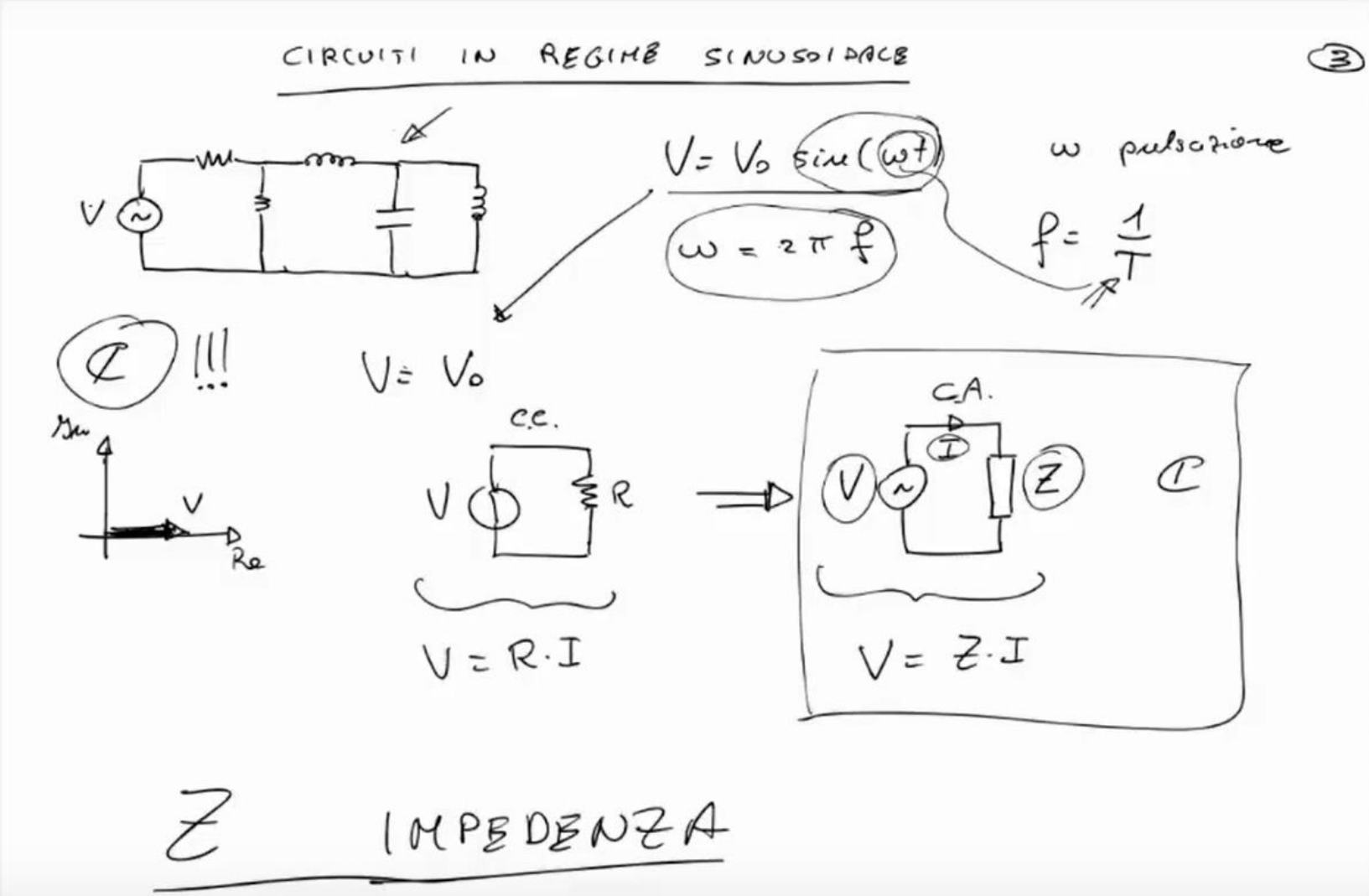
Laboratorio di Elettronica analogica (18-03-2020)

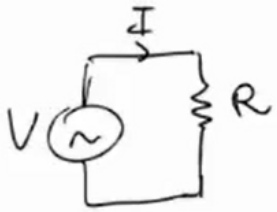
Premi Esc per uscire dalla modalità a schermo intero



28:04 / 1:54:40

Scorri per i dettagli

R in reg. sin



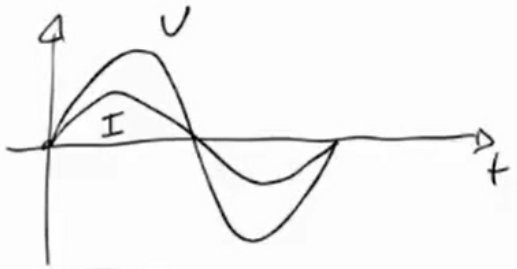
$V = R\,I$

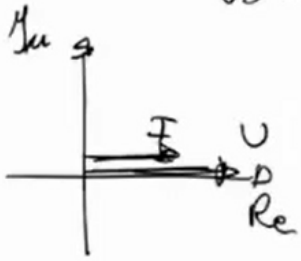
$V(t) = R\,I(t)$

$V(t) = V_0 \sin(\omega t)$

$I(t) = I_0 \sin(\omega t)$

$V_0 = R\,I_0$





V I in fase

$Z_R = R$

Reale

L in regime sin

$V = V_0 \cdot \sin(\omega t)$

$-\cos(\omega t) = \sin(\omega t - \frac{\pi}{2})$

$V_L = L \frac{di(t)}{dt} = V$

$i(t) = \frac{V_0}{L} \int \sin(\omega t)\, dt = -\frac{V_0}{\omega L} \cos(\omega t)$

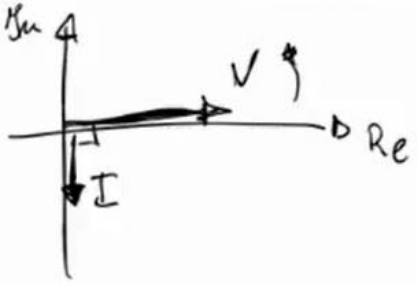
$V(t) = V_0 \sin(\omega t) \Rightarrow \mathbb{C}$

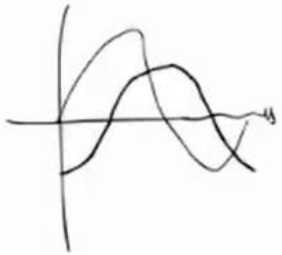
$i(t) = \frac{V_0}{\omega L} \sin(\omega t - \frac{\pi}{2}) \Rightarrow \mathbb{C}$

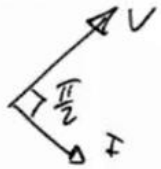
I_0 — SFASAMENTO

$I_0 = \frac{V_0}{\omega L}$

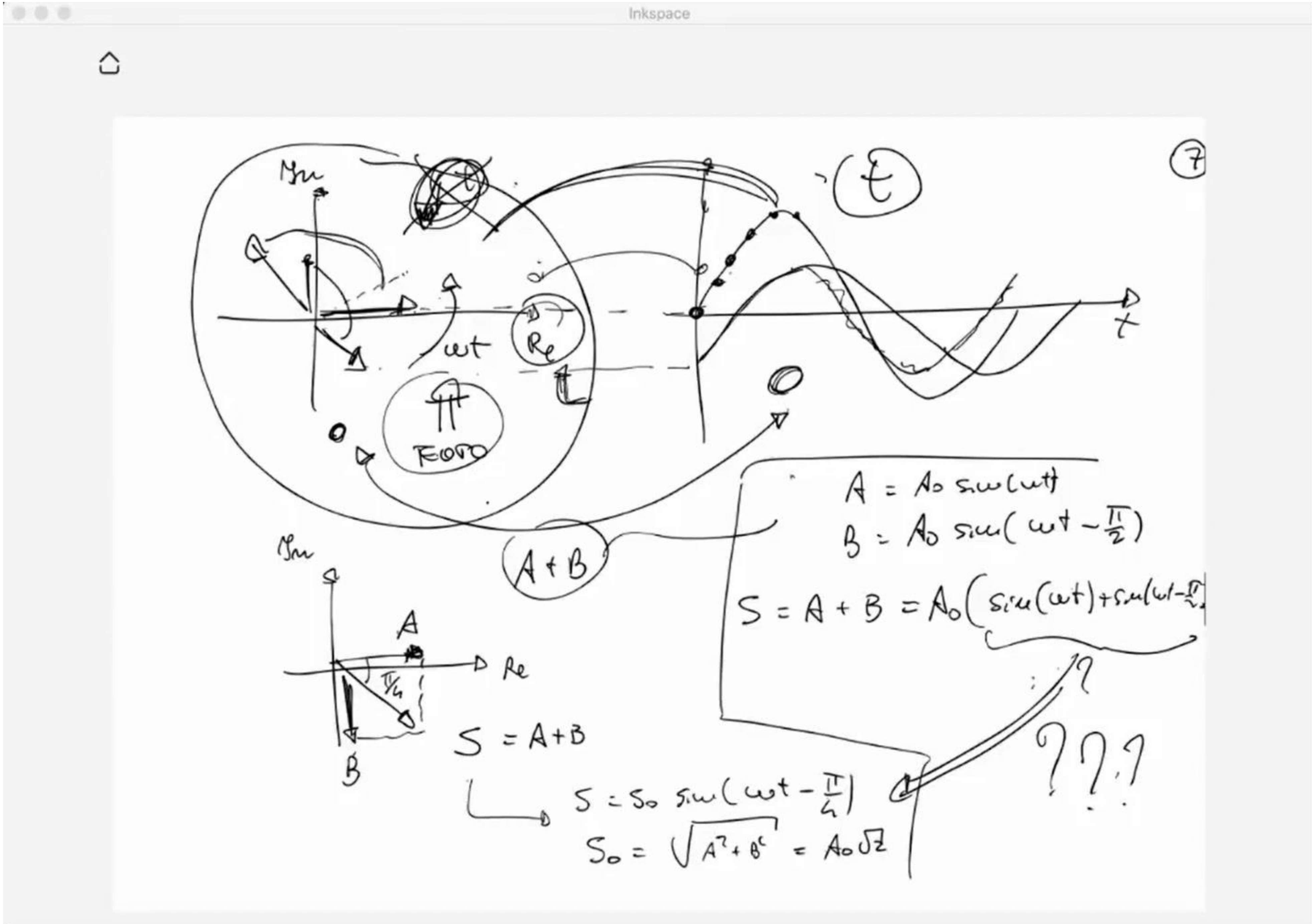
L I sfasata in ritardo di $\frac{\pi}{2}$ rispetto a V



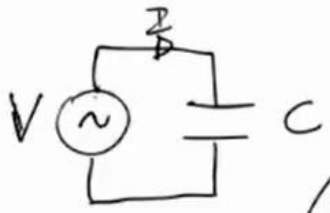




Z ⟹


Inkspace
7
Im
ωt
Re
t
t
FOTO
A + B
Im
A
Re
π/4
B
S = A + B
S = S0 sin(ωt − π/4)
S0 = √(A² + B²) = A0 √2
A = A0 sin(ωt)
B = A0 sin(ωt − π/2)
S = A + B = A0 (sin(ωt) + sin(ωt − π/
???

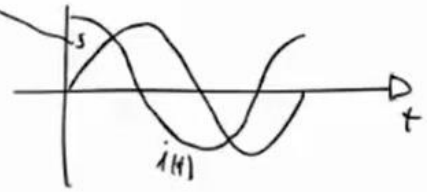
C



$C = \frac{Q}{V}$

$V(t) = V_0 \sin(\omega t)$

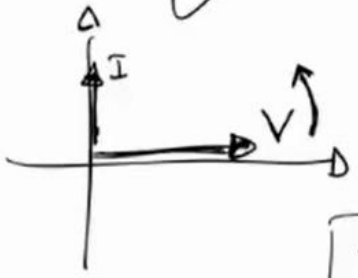
$i(t) = ?$



$Q = C \cdot V$

$i(t) = \frac{dQ(t)}{dt} = C\frac{dV}{dt} = \omega C V_0 \cos(\omega t)$

$i(t) = \omega C V_0 \sin\left(\omega t + \frac{\pi}{2}\right)$



(C) I ANTICIPO DI $\frac{\pi}{2}$ rispetto V

$I = j\omega C V$

$(V = ZI)$

$V = \frac{-jX_C}{} I$

$V = Z_C I$

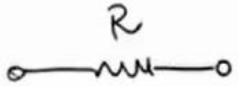
Def REATTANZA CAPACITIVA $X_C = \frac{1}{\omega C}$

Def IMPEDENZA CAPACITIVA $Z_C = -jX_C$

REGIME ALTERNATO SINUSOIDALE

$V = V_0 \sin(\omega t)$ — Reale.

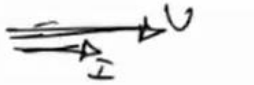
R



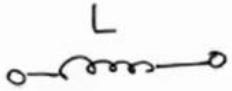
$V = Z_R I$

$Z_R = R$

V I sono in fase



L

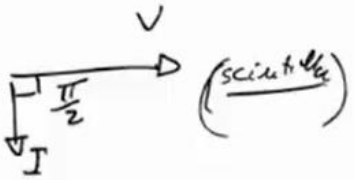


$V = Z_L I$

$Z_L = jX_L$

$X_L = \omega L$

V I I retondo $\frac{\pi}{2}$ risp V



C

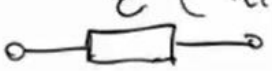
$V = Z_C \cdot I$

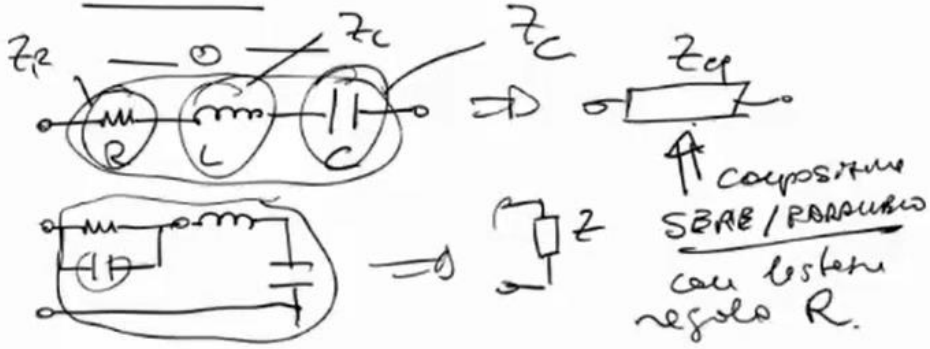
$Z_C = -jX_C$

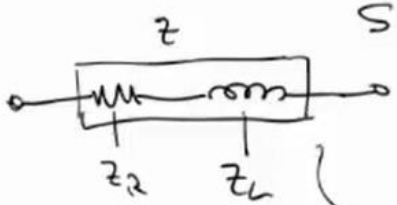
$X_C = \frac{1}{\omega C}$

V I I anticipo $\frac{\pi}{2}$ risp V.

Z (R, L, C)



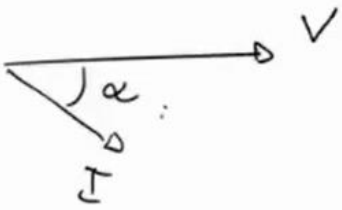




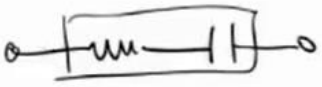
Stessa regola per come R

$$\underline{Z} = Z_R + Z_L = R + jX_L$$

$$\boxed{\underline{Z} = R + jX_L}$$

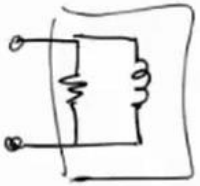


$$\alpha = \operatorname{arctg} \frac{X_L}{R}$$



$$\underline{Z} = R - jX_C$$

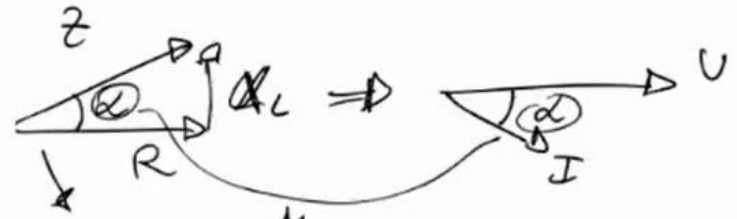
$$\beta = \operatorname{arctg} \frac{X_C}{R}$$



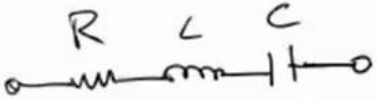
$$\frac{1}{\underline{Z}} = \frac{1}{Z_R} + \frac{1}{Z_L} = \frac{1}{R} + \frac{1}{jX_L} = \frac{jX_L + R}{jRX_L}$$

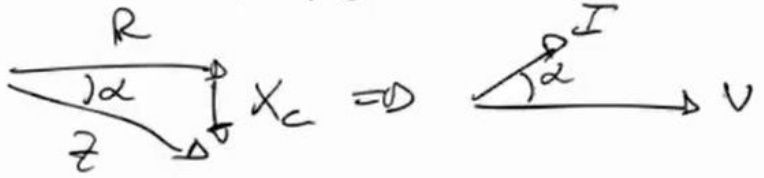
$$\underline{Z} = \frac{jRX_L}{R + jX_L} = \frac{jRX_L(R - jX_L)}{R^2 + X_L^2} = \frac{RX_L^2 + jR^2X_L}{R^2 + X_L^2}$$

$$Z = Z_{Re} + j\,Z_{Im}$$



$$\alpha = \text{arctg}\,\frac{Y_{Im}}{Re}$$



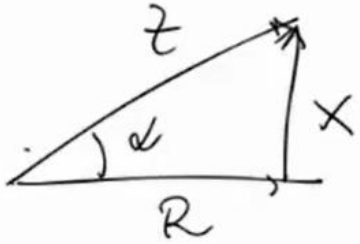


$$X_L = X_C$$

$$z = R + jX_L - jX_C = R$$

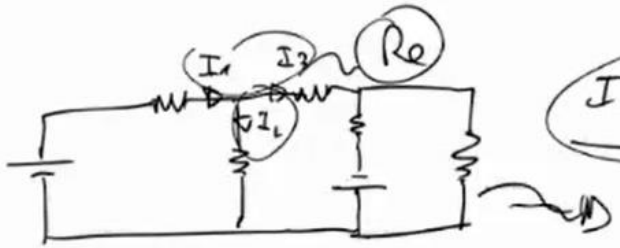
$$\boxed{Z = R + j\,X}$$

Re Im



$$\alpha = \text{arctg}\,\frac{X}{R}$$

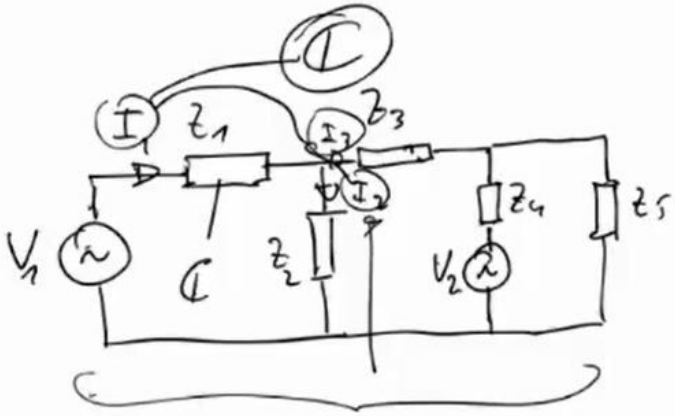
C_C.



I e II Kc

R

C_A.



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I e II Kc.

C

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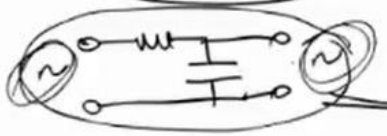
ELETTRONICA ANALOGICA

SIN ? ⟹

FILTRI



RC | CR

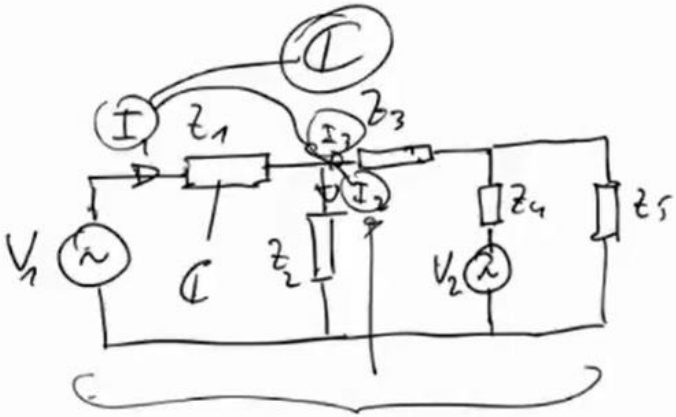
RL | CR

"PARTITORE"

Riduce / sfasa dipende W

C.C.

C.A.



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I e II K.

C

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ELETTRONICA ANALOGICA