

# BEISPIEL: VON ZEITFESTIGKEIT IM ZEITFESTIGKEIT - UND IM COMPLEX

ZEITFESTIGKEIT

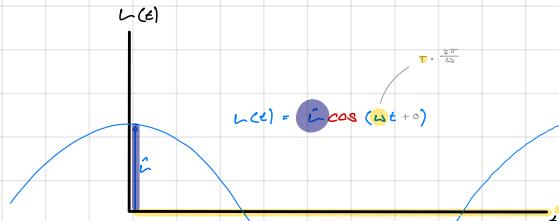
$$L(t) = L_0 \cos(\omega t + \varphi) \quad t \in \mathbb{R}$$

ROTIERENDER ZEITER

$$\hat{L} = L_0 e^{j\omega t} e^{j\varphi} \quad t \in \mathbb{C}, \omega \in \mathbb{R}$$

STILLER ZEITER

$$\hat{L} = L_0 e^{j\varphi} \quad t \in \mathbb{C}$$



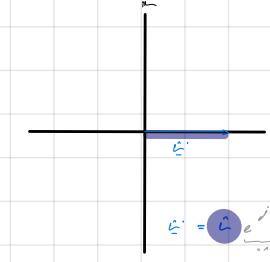
WIR FASSEN EIN  
SIGNAL IM ZEITFESTIGKEIT  
ALS REALTEIL EINES  
KOMPLEXEN ROTIERENDEN  
ZEITERS AUF.

$$L(t) = \operatorname{Re} \hat{L} e^{j\omega t}$$

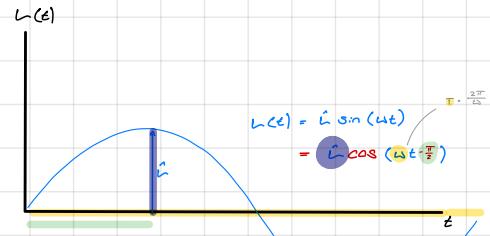
IMPLIZITE SEITE



$$\hat{L} = L_0 e^{j\omega t} e^{j\varphi}$$

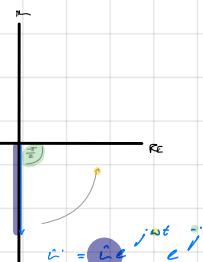


$$\hat{L} = L_0 e^{j\varphi}$$

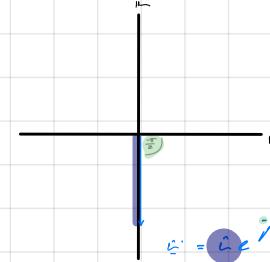


$$L(t) = \operatorname{Re} \hat{L} e^{j\omega t}$$

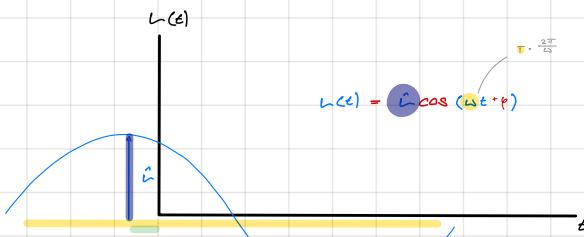
$$= L_0 \cos\left(\omega t + \frac{\pi}{2}\right)$$



$$\hat{L} = L_0 e^{j\omega t} e^{j\pi/2}$$

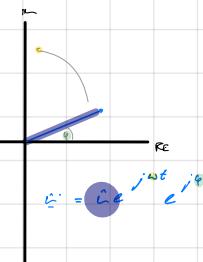


$$\hat{L} = L_0 e^{j\pi/2}$$

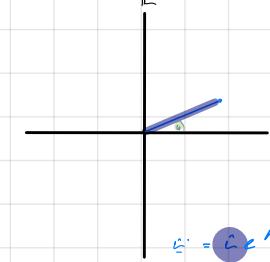


$$L(t) = L_0 \cos(\omega t + \varphi)$$

$$L(t) = \operatorname{Re} \hat{L} e^{j\omega t}$$



$$\hat{L} = L_0 e^{j\omega t} e^{j\varphi}$$



$$\hat{L} = L_0 e^{j\varphi}$$

DIFFERENTIAL

$$L(t) = 2 \cos(\omega t + \varphi) \quad t \in \mathbb{R}$$

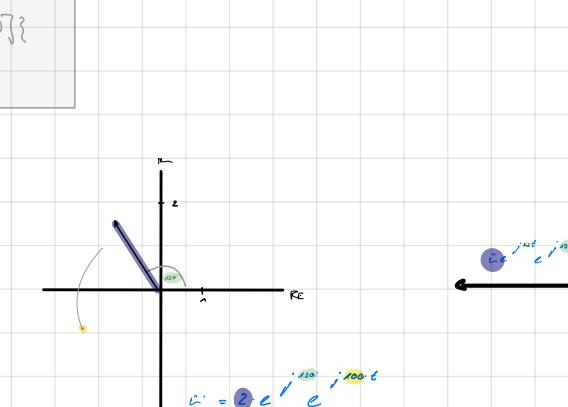
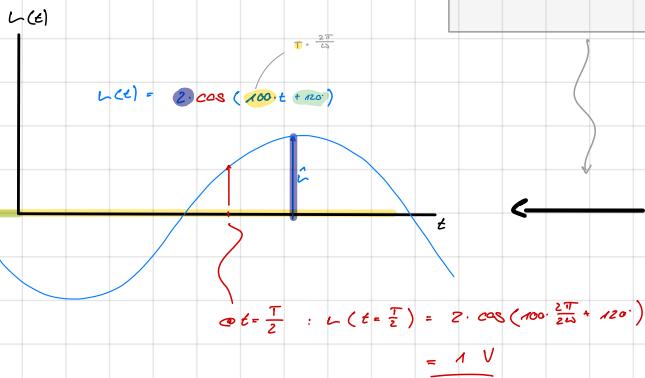
REFLEKTIERENDER ZEITER

$$\hat{L} = 2 e^{i \omega t} e^{i \varphi} \quad t \in \mathbb{C}, \varphi \in \mathbb{R}$$

STILLER ZEITER

$$\hat{L} = 2 e^{i \varphi} \quad t \in \mathbb{C}$$

GESETZ:  $\hat{L} = 2V$  und  $\omega = 100 \frac{1}{\text{Hz}}$



an  $t=0$  WELLE WIR  
 $\hat{L} = -1 + i \cdot \sqrt{3} = 2 e^{i 120^\circ}$   
(28 ALS EINER HARMONISCHE)

