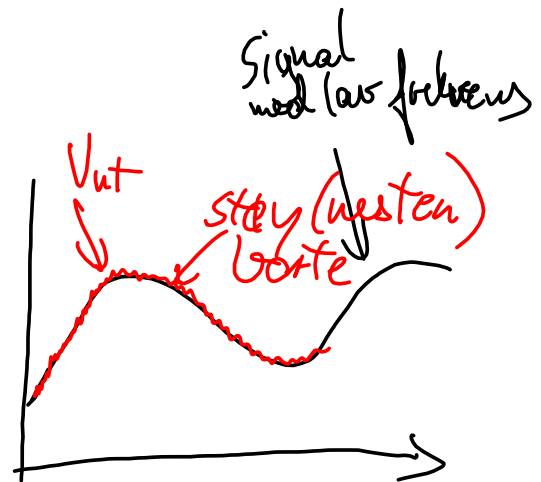
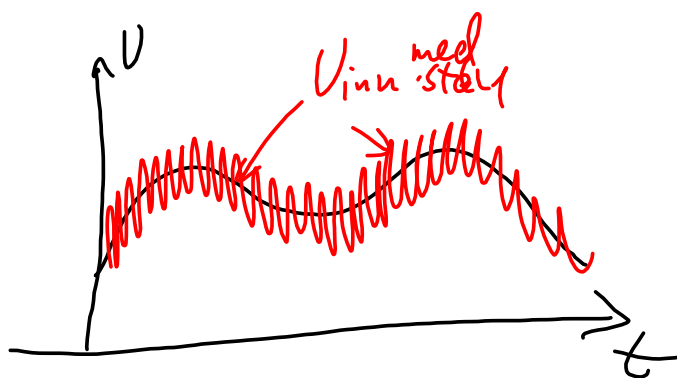


Kondensator

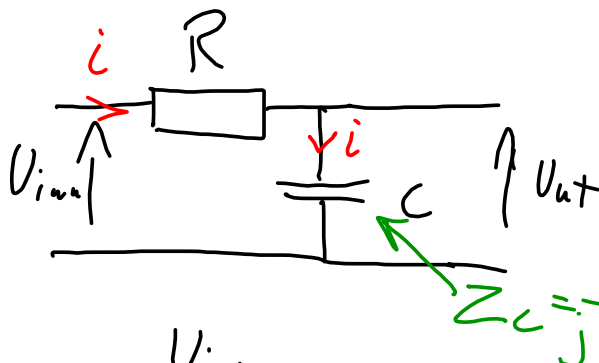
Impedans : $Z_c = \frac{1}{j2\pi f C}$

i fase \uparrow *Motstand* \uparrow *faseinfe*

Lavpassfilter (LP-filter)



LP-filter



$$\frac{V_{ut}}{V_{inn}} = ?$$

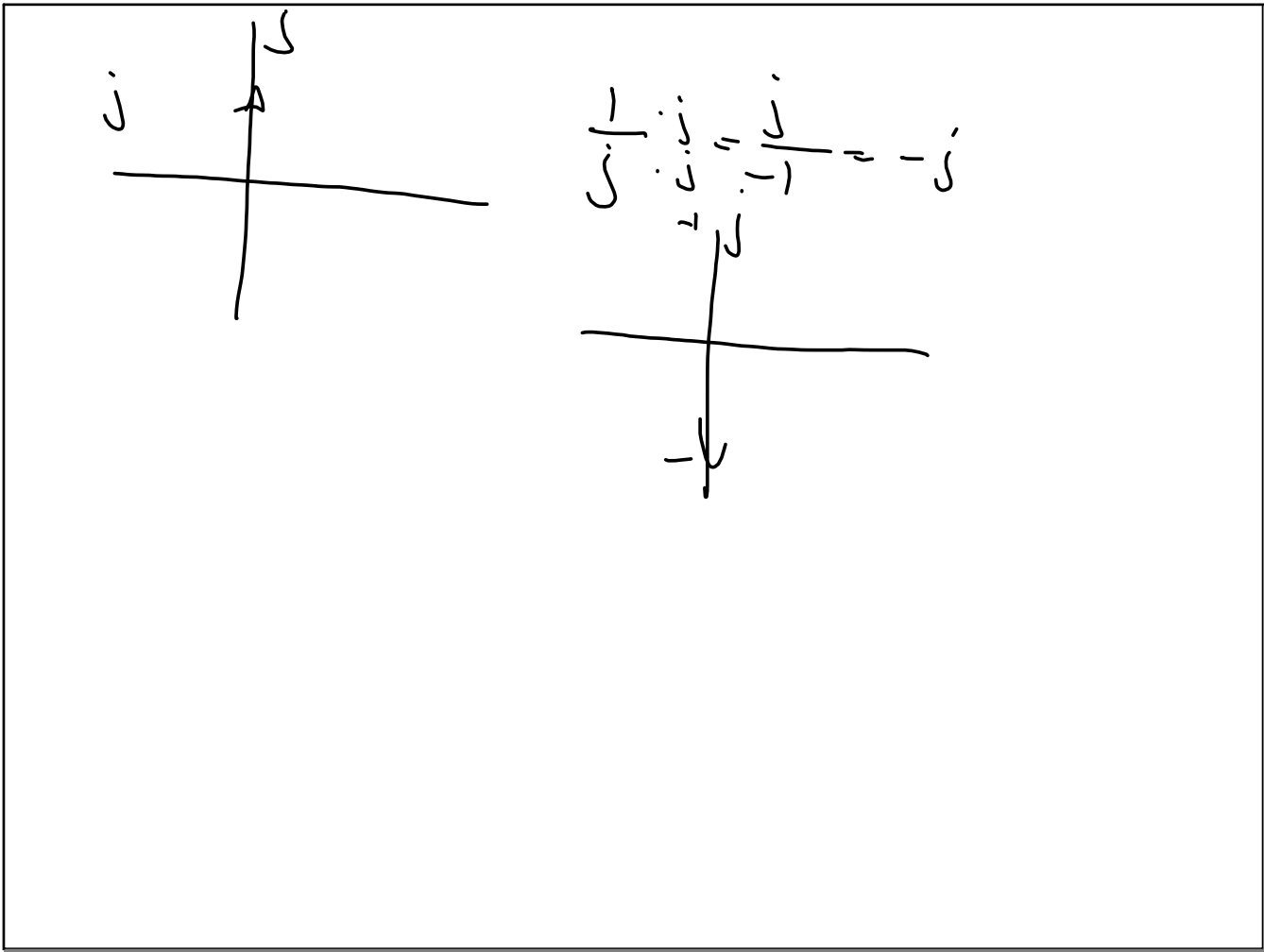
$$i = \frac{V_{inn}}{R + Z_C} \quad V_{ut} = i \cdot Z_C$$

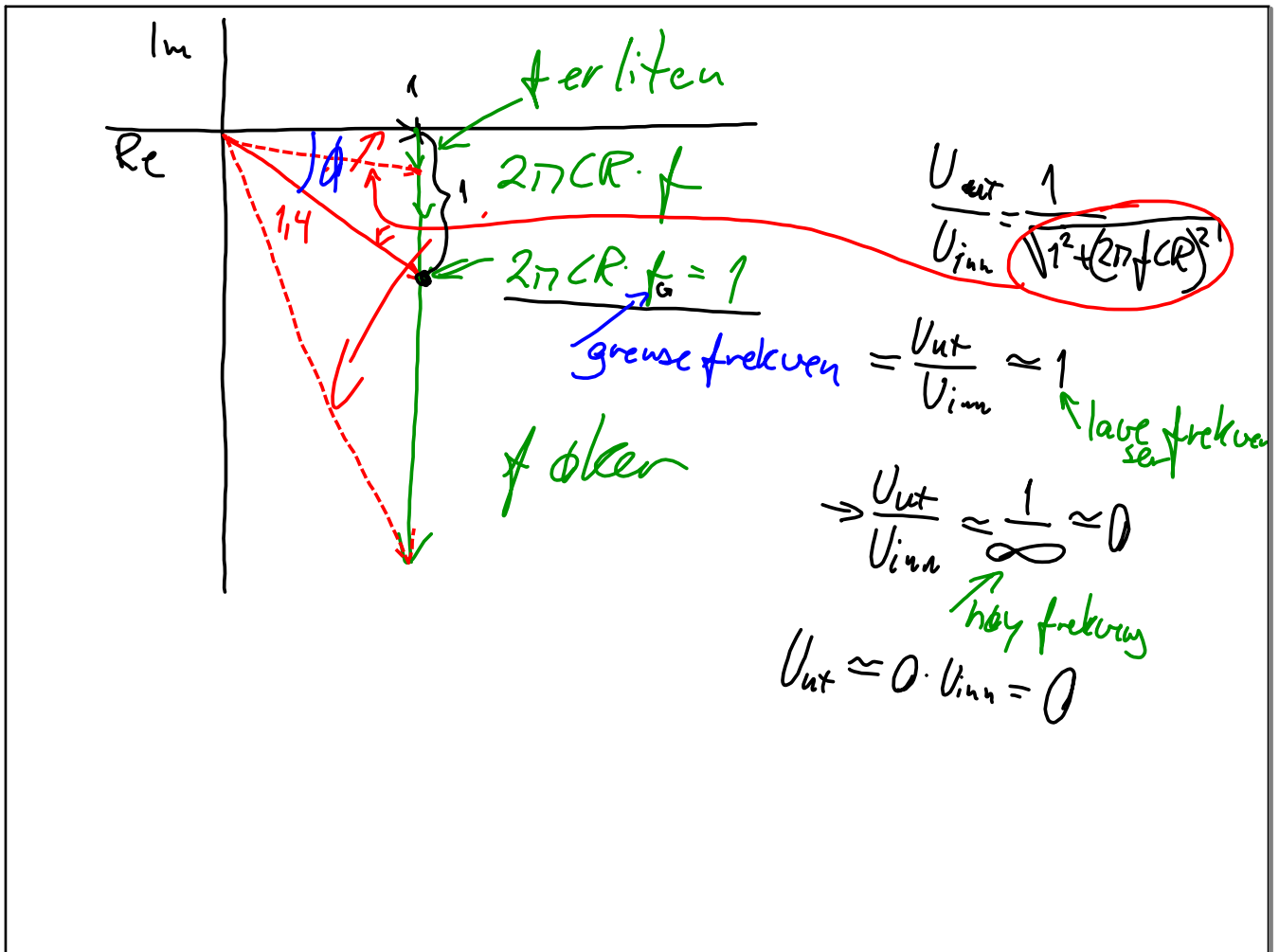
$$V_{ut} = \frac{V_{inn}}{R + Z_C} \cdot Z_C$$

$$\frac{V_{ut}}{V_{inn}} = \frac{Z_C}{R + Z_C} = \frac{\frac{1}{j2\pi f C}}{R + \frac{1}{j2\pi f C}} = \frac{1}{j2\pi f C \cdot R + 1}$$

$$\frac{V_{ut}}{V_{inn}} = \frac{1}{1 + j2\pi f C R}$$

Imaginær-led \nearrow Real-del \nearrow





$$2\pi CR \cdot f_0 = 1$$

$$f_0 = \frac{1}{2\pi CR}$$

$\frac{U_{ut}}{U_{inn}}$	f
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$$\left| \frac{U_{ut}}{U_{inn}} \right| = \frac{1}{\sqrt{1^2 + (2\pi f CR)^2}}$$

Vi har en krets med en verdi på C og R

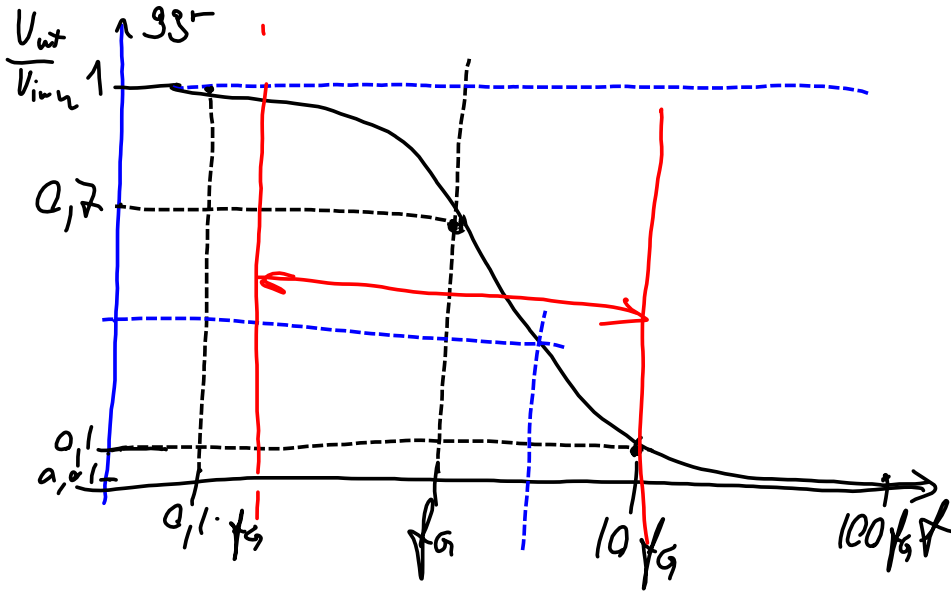
$$f_0 = \frac{1}{2\pi CR} \Rightarrow 2\pi CR = \frac{1}{f_0}$$

$$\frac{1}{\sqrt{1^2 + (2\pi CR \cdot f)^2}}$$

$$\frac{1}{\sqrt{1^2 + \left(\frac{f}{f_0}\right)^2}}$$

$\frac{f}{f_0}$	$\left \frac{U_{ut}}{U_{inn}} \right $	f
0,1	~ 1	$0,1 \cdot f_0 = 0,1 \cdot 100 = 10 \text{ Hz}$
1	0,7	$f_0 = 100 \text{ Hz}$
10	$\sim 0,1$	$10 \cdot f_0 = 1000 \text{ Hz}$

Erkenn $f_0 = 100 \text{ Hz}$



Man bruker desibel skala istedet gar

$$20 \cdot \log \left| \frac{U_{out}}{U_{in}} \right|$$

$$20 \log 1 \approx 0, \text{ dB}$$

$$20 \log 0,7 \approx -3,0$$

$$20 \log 0,1 \approx -20$$

