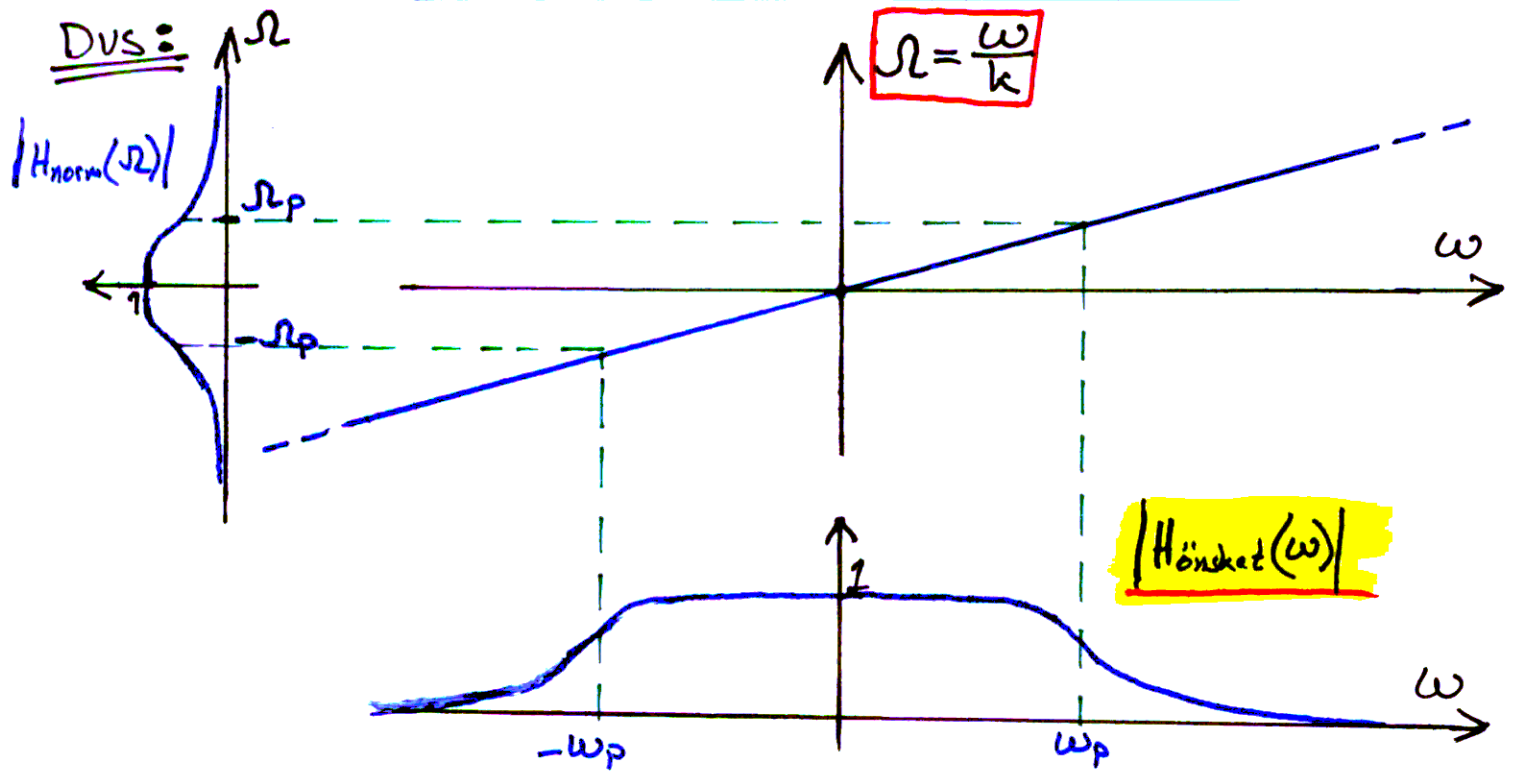
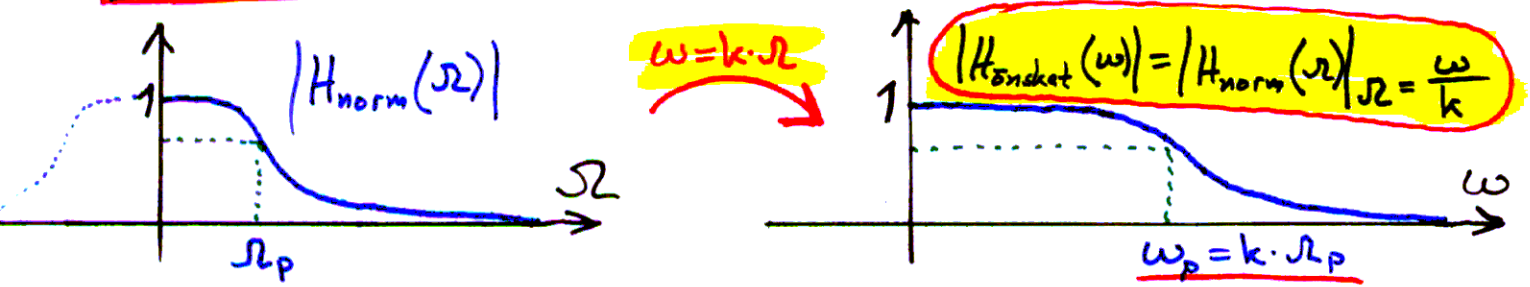


FREKVENSTRANSFORMATIONER / FILTERTRANSFORMATIONER

$$\begin{cases} |H_{norm}(\Omega)| \rightarrow |H_{\text{önsket}}(\omega)| \\ H_{norm}(s) \rightarrow H_{\text{önsket}}(s) \end{cases}$$

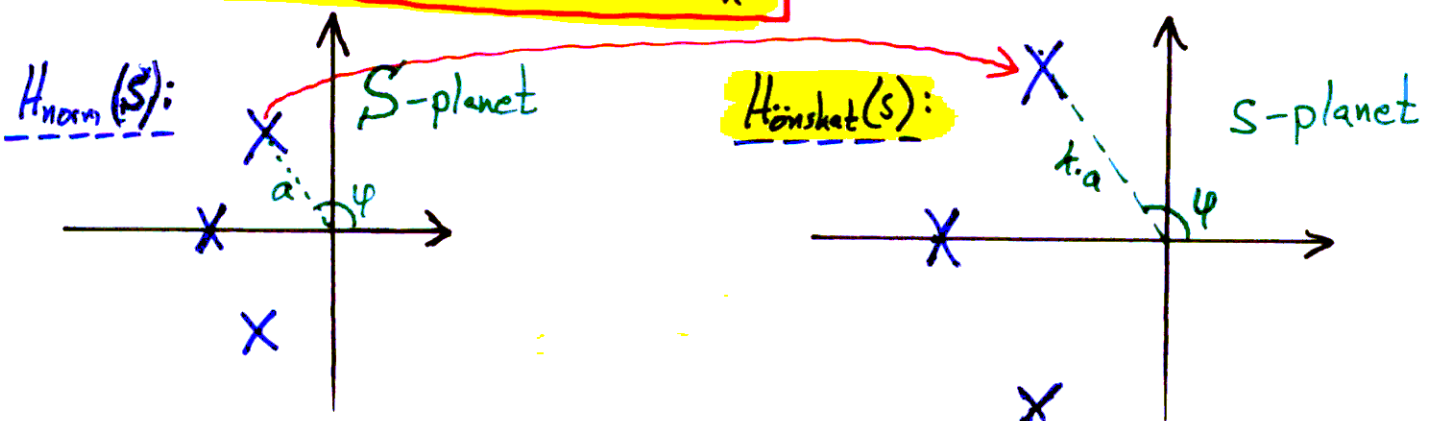
$H_{norm} = H_{LP}$
 $H_{\text{önsket}} = LP, HP, BP, BS$

LP \rightarrow LP

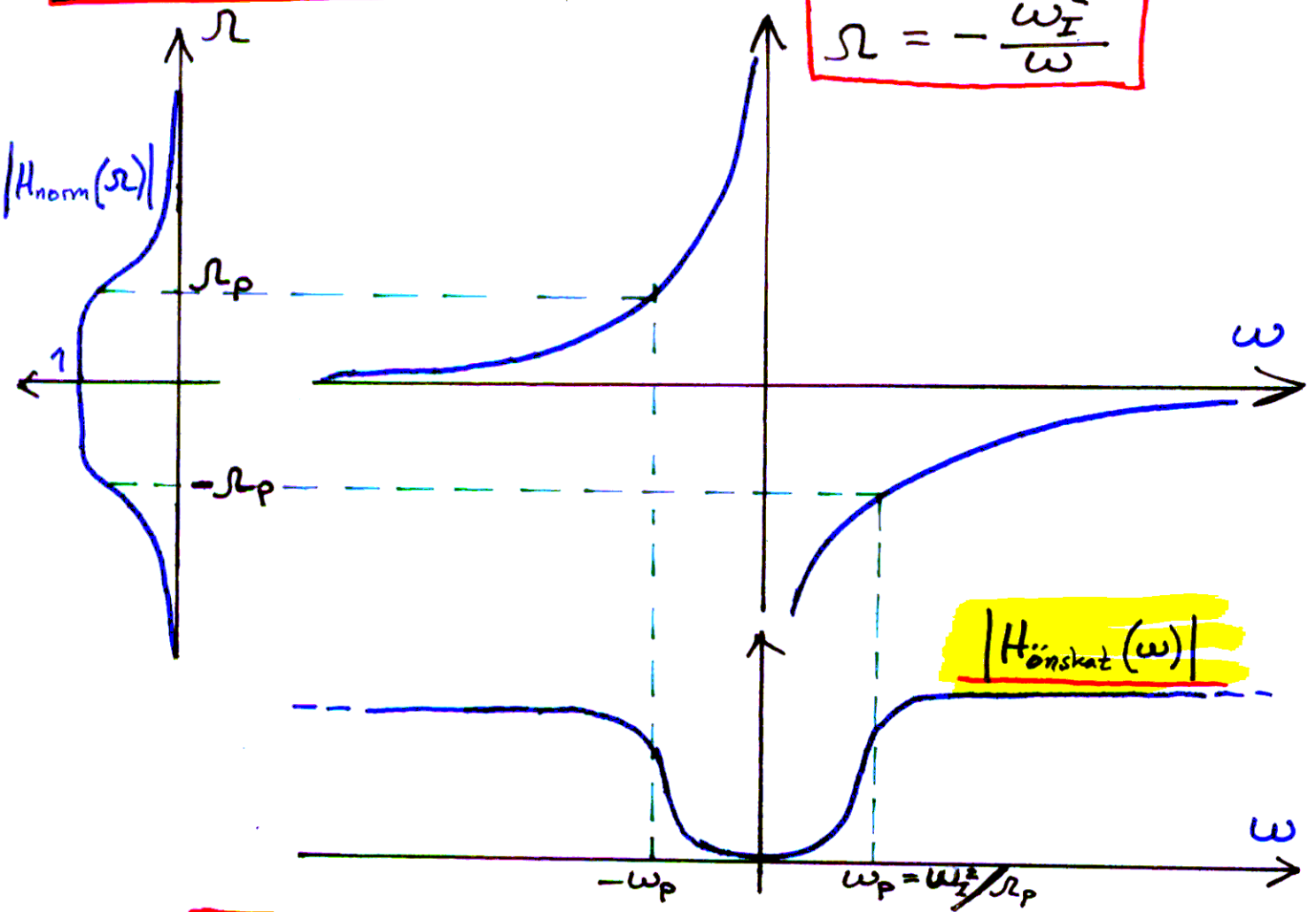


$H_{\text{önsket}}(s) = H_{norm}(S) \Big|_{S = \frac{s}{k}}$

$S = j\Omega \rightarrow s = j\omega = jk\Omega$



LP \rightarrow HP



$\Omega = -\frac{\omega_I^2}{\omega}$

$|H_{\text{önskat}}(\omega)| = |H_{\text{norm}}(\Omega)|_{\Omega = -\frac{\omega_I^2}{\omega}}$

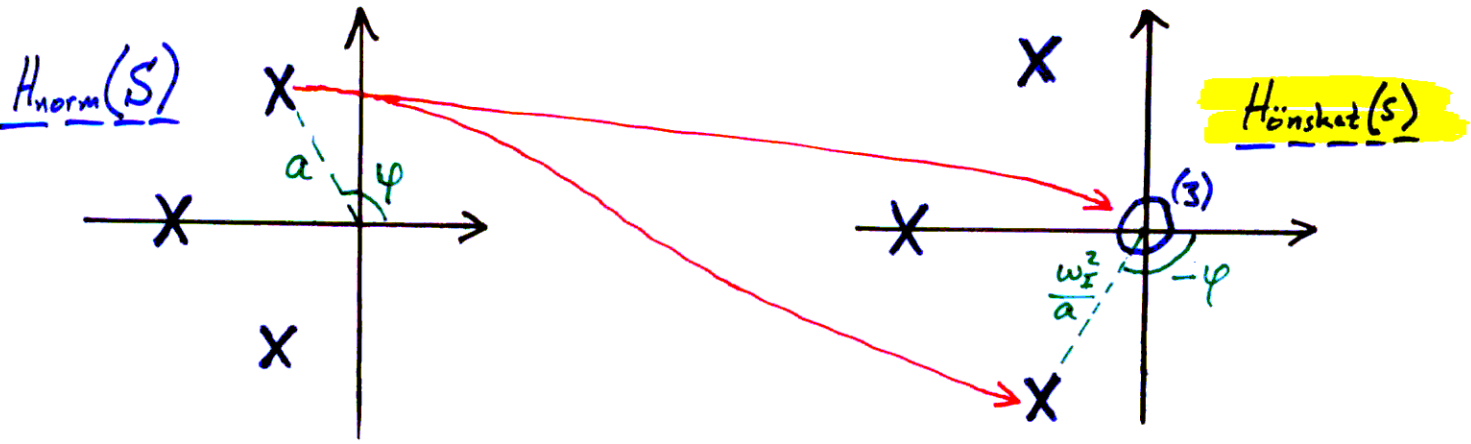
$-\Omega_p \rightarrow +\omega_p$
 $\pm \text{ex.} \Rightarrow \underline{\omega_I^2 = \Omega_p \cdot \omega_p}$

$H_{\text{önskat}}(s) = H_{\text{norm}}(S) \Big|_{S = \frac{\omega_I^2}{s}}$

$S = j\underline{\Omega} = \frac{\omega_I^2}{j\omega} = j \left(-\frac{\omega_I^2}{\omega} \right)$

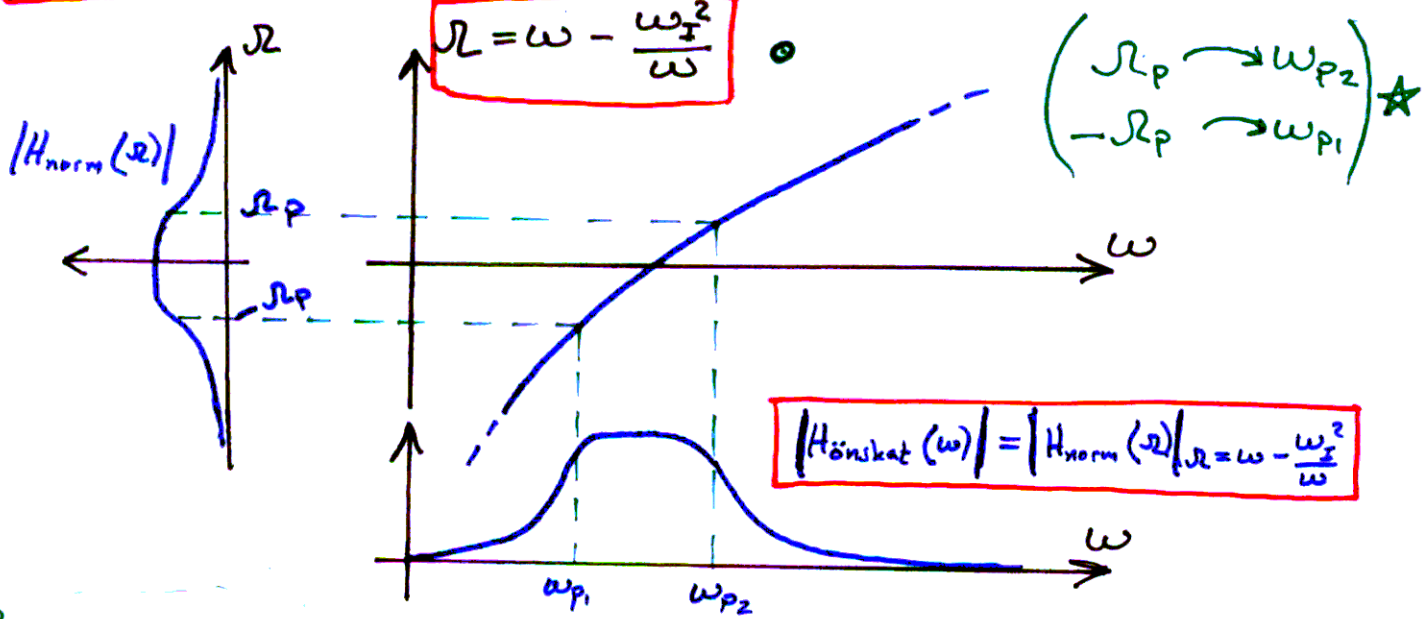
Abbildung für pol i P_i hos $H_{\text{norm}}(S)$:

$\frac{1}{s - P_i} \Big|_{S = \frac{\omega_I^2}{s}} = \frac{1}{\frac{\omega_I^2}{s} - P_i} = \frac{-1}{P_i} \cdot \frac{s}{s - \frac{\omega_I^2}{P_i}}$, dvs. pol \rightarrow pol nollst. i origo



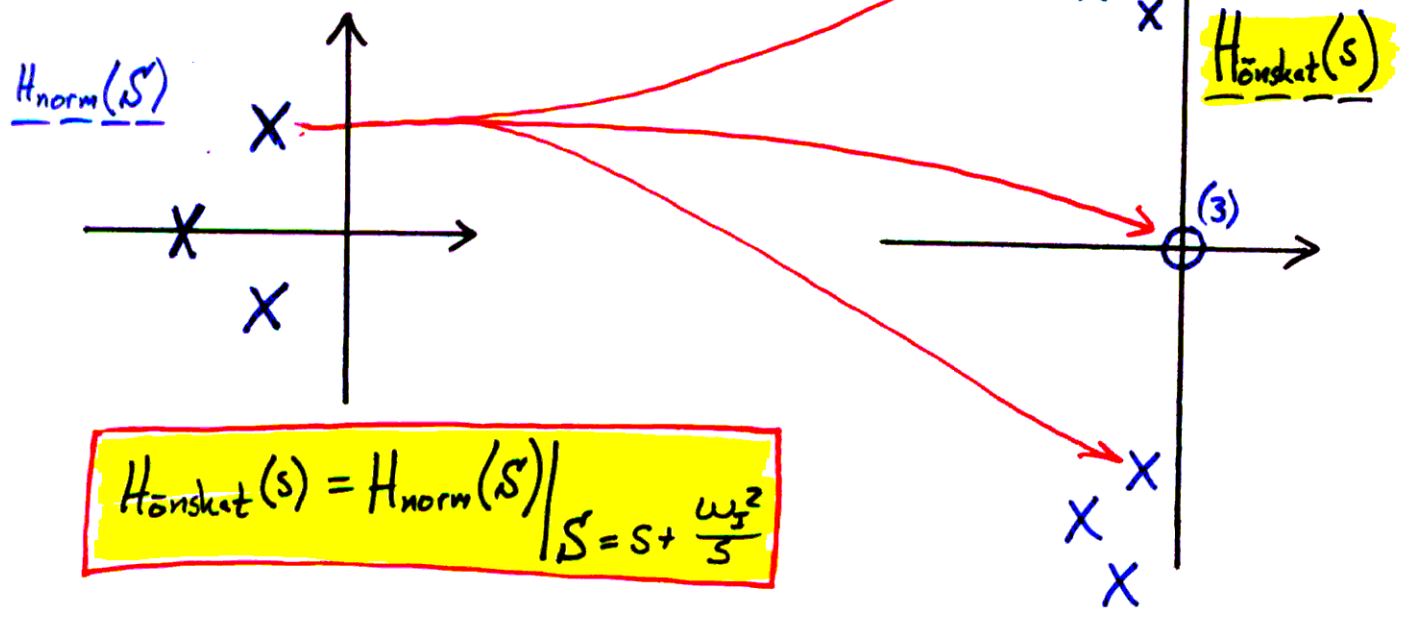
LP → BP

se ppt-bild 21!



$\star \& \odot \Rightarrow$
 $\omega_I^2 = \omega_{p1} \cdot \omega_{p2}$

$\omega_p = \omega_{p2} - \omega_{p1}$



LP → BS

$H_{\text{bskat}}(s) = H_{\text{norm}}(s) \Big|_{s = \frac{\omega_I^2}{s + \frac{\omega_I^2}{s}}}$

