

TODO POR UNA

+1 pto $\rightarrow \omega_0$

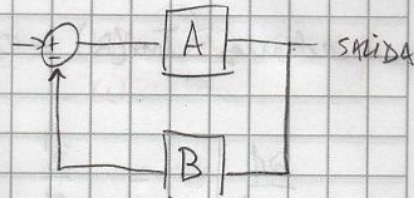
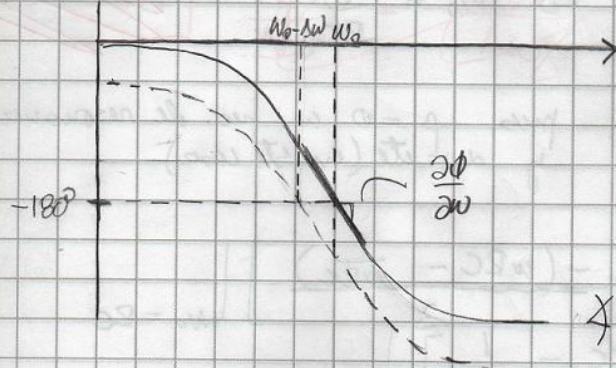
+2 pto $\rightarrow \phi$

-0,5 por número

FECHA:

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PAUTA PG EXAMEN



si $\frac{\partial \phi}{\partial \omega} \uparrow$ es mas estable

$\angle (A \cdot B)$

$\angle (A \cdot B) - \Delta \phi$

Si A es real puro el análisis se centra en B.

linealizando $\Rightarrow \frac{\Delta \phi}{\Delta \omega} = \frac{\partial \phi}{\partial \omega} \quad \phi = \angle B$

Si $B = \alpha + j\beta \Rightarrow \tan \phi = \frac{\beta}{\alpha}$

$\Rightarrow \phi = \arctan\left(\frac{\beta}{\alpha}\right)$

$\frac{\partial \phi}{\partial \omega} = \frac{1}{1 + \left(\frac{\beta}{\alpha}\right)^2} \cdot \frac{\beta' \cdot \alpha - \alpha' \beta}{\alpha^2}$



En este caso $B = \frac{1}{3 + j(\omega RC - \frac{1}{\omega RC})}$

además $\text{Im}(B) = 0 \Rightarrow \omega_0 = \frac{1}{RC}$

$\left. \frac{\partial \phi}{\partial \omega} \right|_{\omega_0} = \frac{A'}{\alpha}$ más $\beta = 0$ en rec. de resonancia
y $\alpha = 1$ (en este caso)

luego: $\frac{\partial \phi}{\partial \omega} = \frac{\partial}{\partial \omega} \left[-\left(\omega RC - \frac{1}{\omega RC} \right) \right] \Big|_{\omega_0 = \frac{1}{RC}}$
 $= \frac{1}{3} \left[-RC - \frac{1}{\omega^2 RC} \right] \Big|_{\omega_0 = \frac{1}{RC}}$
 $= -\frac{2}{3} RC$

entonces: $\frac{\Delta \phi}{\Delta \omega} = -\frac{2}{3} RC$

$\frac{\Delta \omega}{\omega_0} = \frac{\Delta \omega}{\frac{1}{RC}} = \frac{\Delta \phi}{-\frac{2}{3} RC} = -0.05 \cdot \frac{3}{2} = -0.075$

$\boxed{\frac{\Delta \omega}{\omega_0} = -0.075}$

FECHA:

Handwritten notes in red:
 $\omega_0 \rightarrow +1$
 $\frac{\partial \phi}{\partial \omega} \rightarrow +1$
 $\frac{\Delta \omega}{\omega_0} \rightarrow +3$

