

התוצאה היא

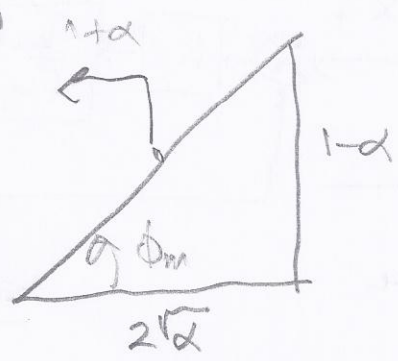
$$\Phi_{\max} = \angle G_c(\omega_m) =$$

$$\tan^{-1} \left\{ T \cdot \frac{1}{T\sqrt{\alpha}} \right\} - \tan^{-1} \left\{ \alpha T \cdot \frac{1}{T\sqrt{\alpha}} \right\} =$$

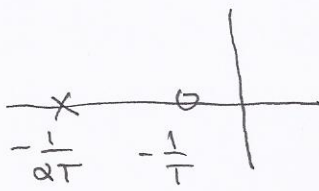
$$\tan^{-1} \frac{1}{\sqrt{\alpha}} - \tan^{-1} \sqrt{\alpha} =$$

$$\begin{aligned} \tan^{-1} \left\{ \frac{\frac{1}{\sqrt{\alpha}} - \sqrt{\alpha}}{1 + \frac{\sqrt{\alpha}}{\sqrt{\alpha}}} \right\} &= \tan^{-1} \left\{ \frac{1}{\sqrt{\alpha}} \cdot \frac{[1-\alpha]}{2} \right\} \\ &= \tan^{-1} \left\{ \frac{1-\alpha}{2\sqrt{\alpha}} \right\} \end{aligned}$$

$$\begin{aligned} &\sqrt{(1-\alpha)^2 + 4\alpha} \\ &\sqrt{1-2\alpha+\alpha^2+4\alpha} \\ &\sqrt{\alpha^2+2\alpha+1} = \\ &1+\alpha \end{aligned}$$



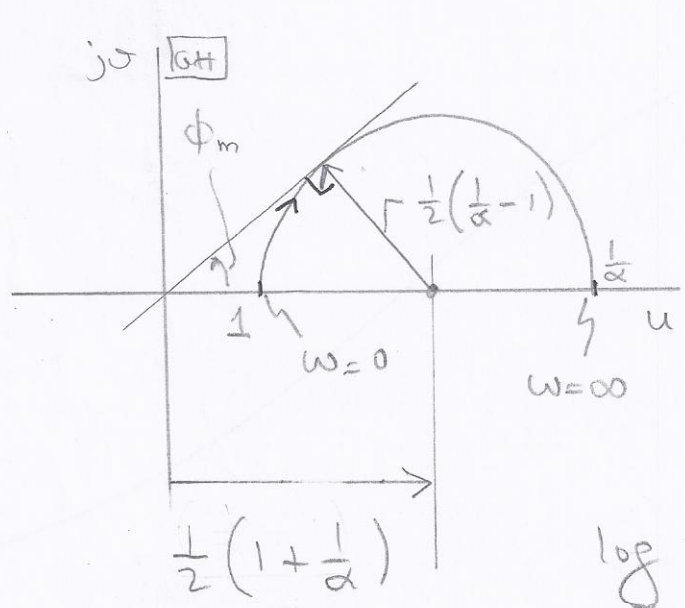
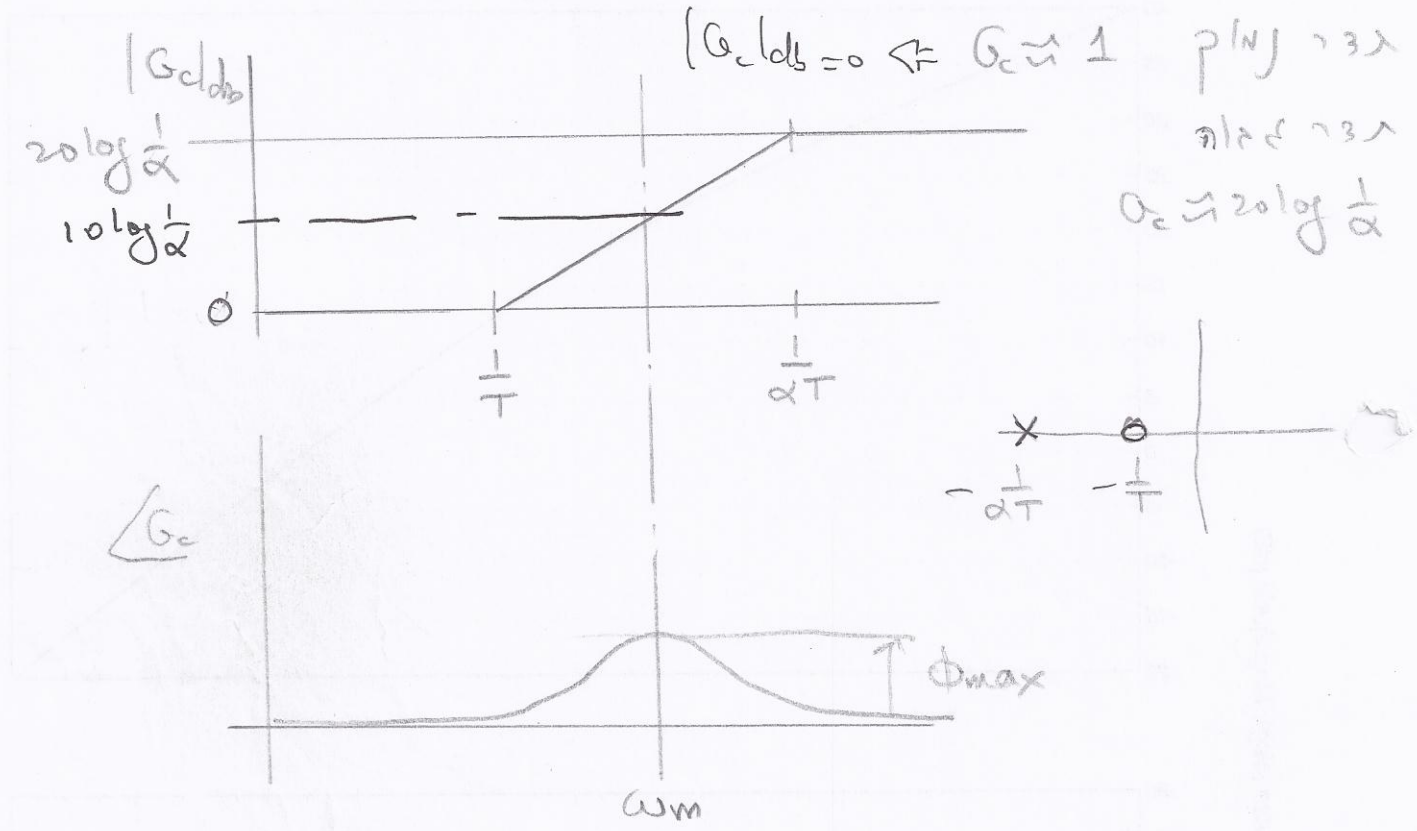
$$\sin \phi_m = \frac{1-\alpha}{1+\alpha}$$



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lead/lag network

$$G_c = \frac{1 + TS}{1 + \alpha TS} \quad 0 < \alpha < 1$$

$$G_c(j\omega) = \frac{1 + Tj\omega}{1 + \alpha Tj\omega}$$



$$\sin \phi_m = \frac{\frac{1}{2} \left( \frac{1}{\alpha} - 1 \right)}{\frac{1}{2} \left( 1 + \frac{1}{\alpha} \right)}$$

$$\boxed{\sin \phi_m = \frac{1 - \alpha}{1 + \alpha}}$$

razka - CNIK, log scale

$$\log \omega_m = \frac{1}{2} \left[ \log \frac{1}{T} + \log \frac{1}{\alpha T} \right]$$

$$\log \omega_m = \frac{1}{2} \log \frac{1}{\alpha T^2} = \log \frac{1}{\sqrt{\alpha} \cdot T}$$

$$\boxed{\omega_m = \frac{1}{\sqrt{\alpha} \cdot T}}$$