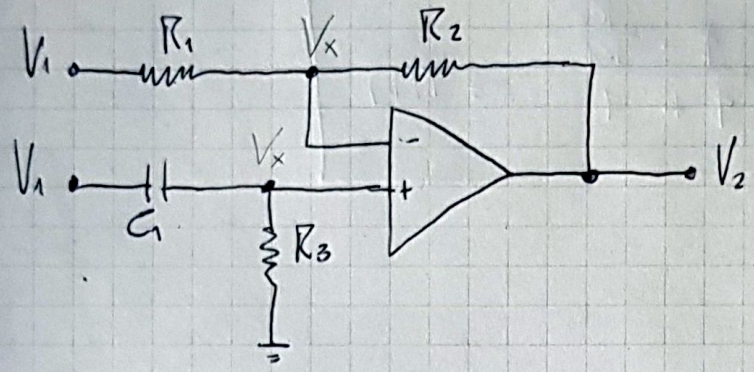
• Trabajo Semanal 1



① $\frac{V_2}{V_1}$? $\longrightarrow$ $V_x = V_1 \cdot \frac{R_3}{R_3 + \frac{1}{sC_1}}$, $I_{R1} = I_{R2}$

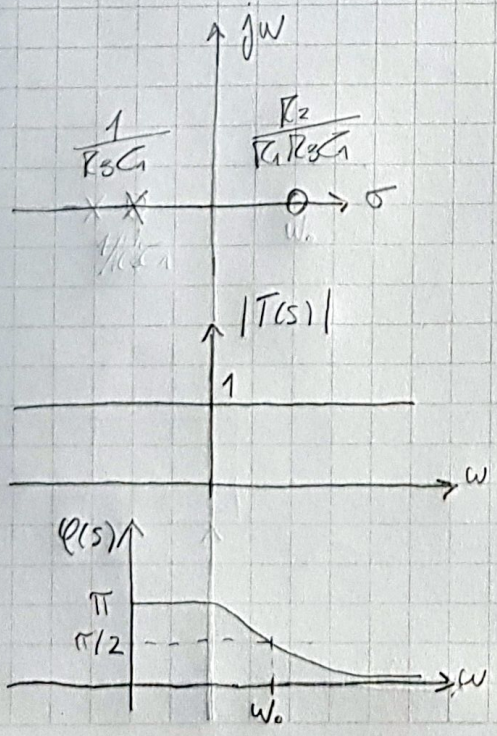
$$I_x = \frac{(V_1 - V_x)}{R_1} = \frac{(V_x - V_2)}{R_2}$$

$$V_1 \left(1 - \frac{R_3}{R_3 + 1/sC_1}\right) \frac{R_2}{R_1} = +V_1 \frac{R_3}{R_3 + 1/sC_1} + V_2$$

$$V_2 = V_1 \left(\left(- \frac{R_2}{R_1} \left(+ \frac{\frac{R_2 R_3}{R_1}}{R_3 + 1/sC_1} + \frac{R_3}{R_3 + 1/sC_1} \right) \right) \right)$$

$$\frac{V_2}{V_1} = \frac{R_3 + \frac{R_3 R_2}{R_1}}{R_3 + 1/sC_1} + \frac{R_2}{R_1} = \frac{R_1 R_3 + R_2 R_3 - R_2 R_3 + R_2/sC_1}{R_1 R_3 + R_1/sC_1}$$

$$\frac{V_2}{V_1} = \frac{-R_1 R_3 C_1 s - R_2}{R_1 R_3 C_1 s + R_1} \Rightarrow \boxed{\frac{V_2}{V_1} = \frac{s + \frac{R_2}{R_1 R_3 C_1}}{s + \frac{1}{R_3 C_1}}}$$



$$T(s)\Big|_{s=jw} = \frac{jw + \frac{R_2}{R_1 R_3 C_1}}{jw + \frac{1}{R_3 C_1}}$$

$$|T(jw)| = \frac{\sqrt{w^2 + \left(\frac{R_2}{R_1 R_3 C_1}\right)^2}}{\sqrt{w^2 + \left(\frac{1}{R_3 C_1}\right)^2}}$$

$$\varphi(jw) = \text{arctg}\left(\frac{-w}{R_2/R_1 R_3 C_1}\right) - \text{arctg}\left(\frac{w}{1/R_3 C_1}\right)$$

$$\varphi(jw) = \pi - \text{arctg}\left(\frac{w}{R_2/R_1 R_3 C_1}\right) - \text{arctg}(w R_3 C_1)$$