


~~Handwritten scribbles and crossed-out text.~~

$$V_c = -V_i \frac{G_1}{G_2 + SC} - V_o \frac{G_3}{G_2 + SC}$$

$$V_A = -V_o$$

$$\frac{V_c}{R_3} = \frac{V_A SC}{R_3}$$

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$$V_o = V_c \frac{G_3}{SC}$$

$$\frac{SC}{G_3} V_o = -V_i \frac{G_1}{G_2 + SC} - V_o \frac{G_1}{G_2 + SC}$$

~~Large handwritten scribbles and crossed-out text.~~

$$V_o \left(\frac{SC}{G_3} + \frac{G_1}{G_2 + SC} \right) = -V_i \frac{G_1}{G_2 + SC}$$

$$\frac{V_o}{V_i} = - \frac{\frac{G_1}{G_2 + SC}}{\frac{SC}{G_3} + \frac{G_1}{G_2 + SC}}$$

$$\frac{V_o}{V_i} = \frac{G_1 G_3}{S^2 C^2 + SC G_2 + G_1 G_3}$$

$$H(s) = - \frac{\frac{1}{R_1 R_3 C^2}}{s^2 + s \frac{1}{CR_2} + \frac{1}{R_3^2 C^2}}$$

luego $R_1 = KR_3 \Rightarrow H(s) = - \frac{1}{K} \cdot \frac{\frac{1}{R_3^2 C^2}}{s^2 + s \frac{1}{CR_2} + \frac{1}{R_3^2 C^2}}$

donde $\omega_0 = \frac{1}{R_3 C}$ y $\frac{Q\omega_0}{\omega} = \frac{1}{CR_2} \Rightarrow Q = \omega_0 CR_2$

que es la forma de F. Transferencia de un filtro de 2° orden

b) $\omega_0 = 1 \Rightarrow R_3 = 1, C = 1$

luego $\frac{1}{3} = \frac{1}{CR_2}$ para $C = 1 \Rightarrow$

$$\boxed{R_3 = 1, C = 1, R_1 = 1} \quad \boxed{R_2 = 3}$$

luego

$R_1 = kR_3 \Rightarrow R_1 = k$ para $|T(0)| = 20 \text{ db} \Rightarrow$

$H(0) = 10 \Rightarrow k = 1/10 \Rightarrow$

$$\boxed{R_1 = 0.1}$$