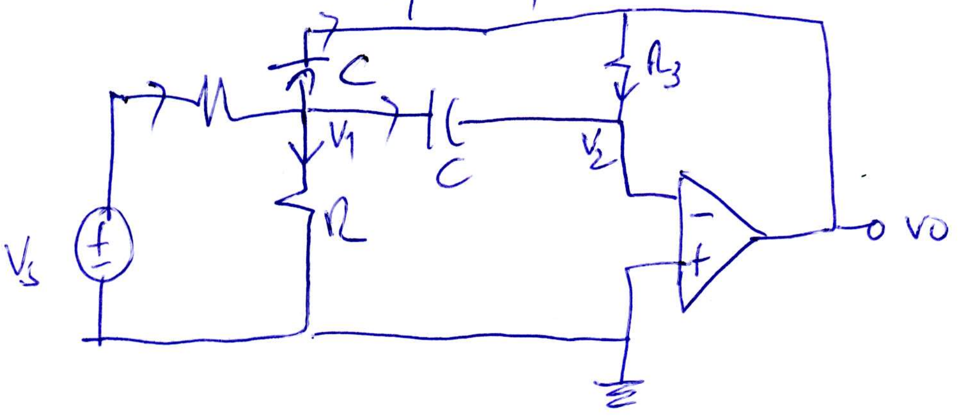
Solución Actividad #11, 2011



$V_2 = V_+ = V_- = 0$

LCK $\quad G(v_s - v_1) = G v_1 + C\dfrac{dv_1}{dt} + C\dfrac{d(v_1 - v_0)}{dt} \qquad (1)$

$G_3 v_0 = -C\dfrac{dv_1}{dt} \Rightarrow \dfrac{dv_1}{dt} = -\dfrac{1}{R_3 C} v_0 \qquad (2)$

De (1) $\quad G v_s = 2G v_1 + 2C\dfrac{dv_1}{dt} - C\dfrac{dv_0}{dt} \qquad /* \dfrac{d}{dt}(\cdot)$

$G\dfrac{dv_s}{dt} = 2C\dfrac{d^2 v_1}{dt^2} + 2G\dfrac{dv_1}{dt} - C\dfrac{d^2 v_0}{dt^2}$

Reemplazando (2) en (1)

$-G\dfrac{dv_s}{dt} = \dfrac{2}{R_3}\dfrac{dv_0}{dt} + \left(\dfrac{2}{RR_3C}\right)v_0 + C\dfrac{d^2 v_0}{dt^2} \qquad \times \dfrac{1}{C}$

$$\boxed{-\frac{1}{RC}\frac{dv_s}{dt} = \frac{d^2 v_0}{dt^2} + \frac{2}{R_3 C}\frac{dv_0}{dt} + \left(\frac{2}{RR_3C^2}\right)v_0}$$

$\therefore \quad \alpha = \dfrac{1}{R_3 C}, \quad \omega_0^2 = \dfrac{2}{RR_3C^2}$

Si $R = R_3 \quad \omega_0 = \dfrac{\sqrt{2}}{RC} > \dfrac{1}{RC} = \alpha$ caso infraamortiguado