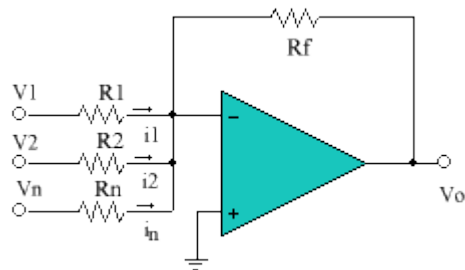


Tarea 1.

Johan Miguel Arrieta Morera

Amplificadores Operacionales

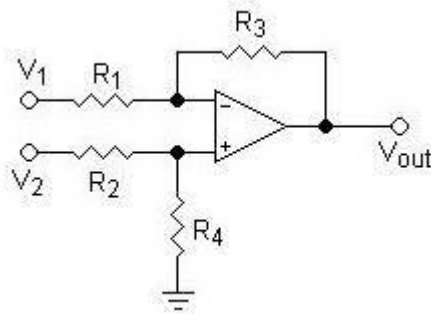
1. Suma



$$V_{out} = -R_f * \left(\frac{V_1}{R_1} + \frac{V_2}{R_2} + \dots + \frac{V_n}{R_n} \right)$$

En este caso la F(s) estará condicionada a la relación entre voltaje de entrada y sus respectivas resistencias.

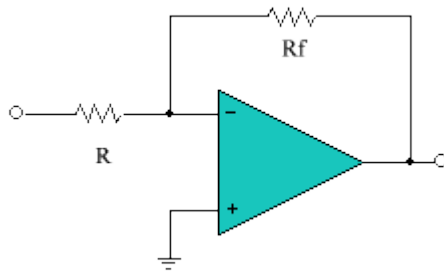
2. Resta



$$V_{out} = V_2 * \left(\frac{(R_3 + R_1) * R_4}{(R_4 + R_2) * R_1} \right) - V_1 * \left(\frac{R_3}{R_1} \right)$$

En este caso la F(s) estará condicionada a la relación entre voltaje de entrada y sus respectivas resistencias.

3. Inversor



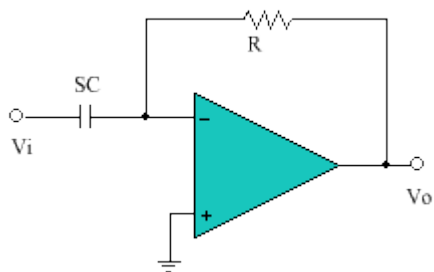
$$Z1 = R$$

$$Z2 = Rf$$

$$F(s) = \frac{-Z2}{Z1} = \frac{-Rf}{R}$$

$$V_{salida}(s) = \frac{-Rf}{R} * V_{entrada}(s)$$

4. Derivación



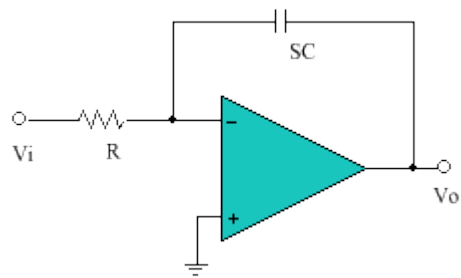
$$Z1 = \frac{1}{j\omega c} == \frac{1}{sC}$$

$$Z2 = R$$

$$F(s) = \frac{-Z2}{Z1} = \frac{-R}{\frac{1}{sC}} = -RSC$$

$$V_{salida}(s) = -RSC * V_{entrada}(s)$$

5. Integrador



$$Z1 = R$$

$$Z2 = \frac{1}{j\omega C} = \frac{1}{SC}$$

$$S = \theta + j\omega \rightarrow s = j\omega$$

$$F(s) = \frac{-Z2}{Z1} = \frac{\frac{-1}{SC}}{R} = \frac{-1}{SCR}$$

$$V.\text{salida}(s) = \frac{-1}{SCR} * V.\text{entrada}$$