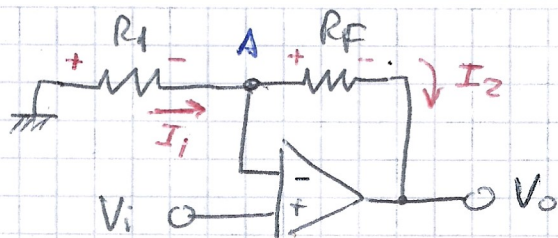


1)



$$I_2 = I_1 + 0 \Rightarrow I = I_1 = I_2$$

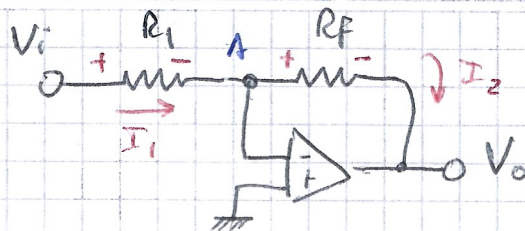
$$V_A = -I \cdot R_1 = V_i$$

$$V_o = V_A - I \cdot R_F = V_i - I \cdot R_F$$

$$A = \frac{V_o}{V_i} = \frac{V_i - I \cdot R_F}{V_i} = 1 - \frac{I \cdot R_F}{(-I \cdot R_1)}$$

$$\therefore A = 1 + R_F/R_1$$

No inverting



$$I_2 = I_1 + 0 \Rightarrow I = I_1 = I_2$$

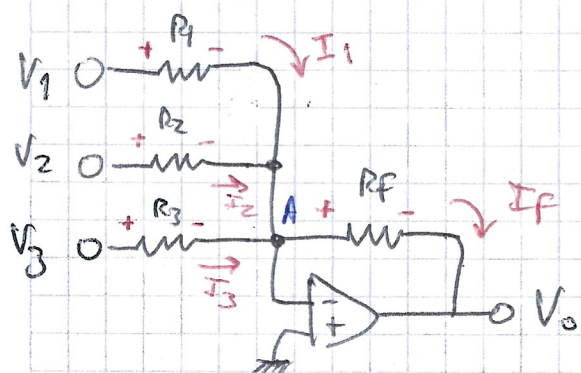
$$V_A = V_i - I \cdot R_1 = 0$$

$$\therefore V_i = I \cdot R_1$$

$$V_o = V_A - I \cdot R_F = -I \cdot R_F$$

$$A = \frac{V_o}{V_i} = \frac{-I \cdot R_F}{I \cdot R_1} = \boxed{-\frac{R_F}{R_1}}$$

Inverting



$$I_F = I_1 + I_2 + I_3$$

$$V_A = V_1 - I_1 \cdot R_1 = 0 \Rightarrow I_1 = V_1/R_1$$

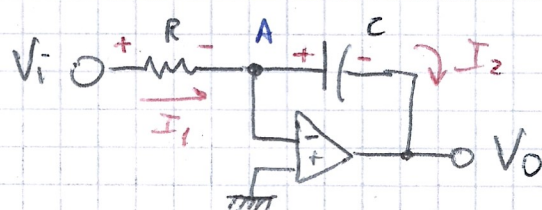
$$V_A = V_2 - I_2 \cdot R_2 = 0 \Rightarrow I_2 = V_2/R_2$$

$$V_A = V_3 - I_3 \cdot R_3 = 0 \Rightarrow I_3 = V_3/R_3$$

$$V_o = V_A - I_F \cdot R_F = -R_F \cdot I_F$$

$$\therefore V_o = -R_F \cdot \sum \frac{V_i}{R_i}$$

Sumador



$$I_2 = I_1 + 0 \Rightarrow I = I_1 = I_2$$

$$V_A = V_i - I \cdot R = 0 \Rightarrow I = V_i/R$$

$$V_o = V_A - V_C(t) = -\frac{1}{C} \int i(t) dt$$

$$\therefore V_o = -\frac{1}{RC} \int V_i(t) dt$$

Integrador