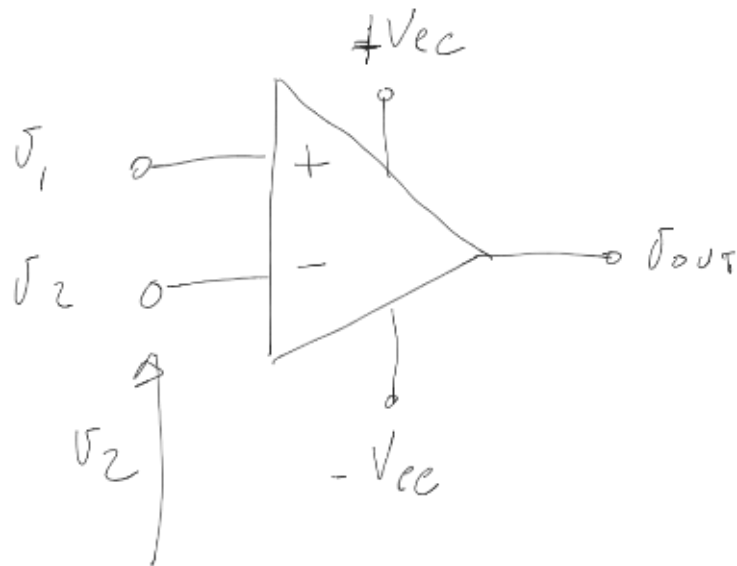
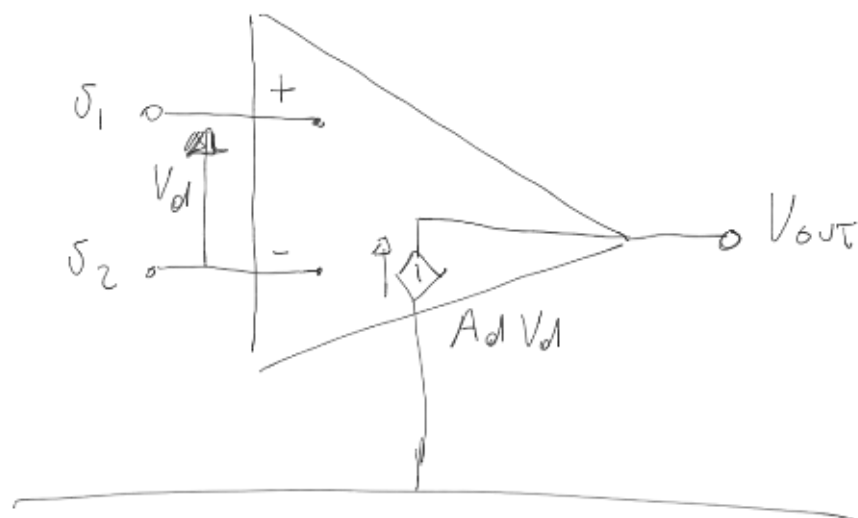


# App. OPERAZIONALI

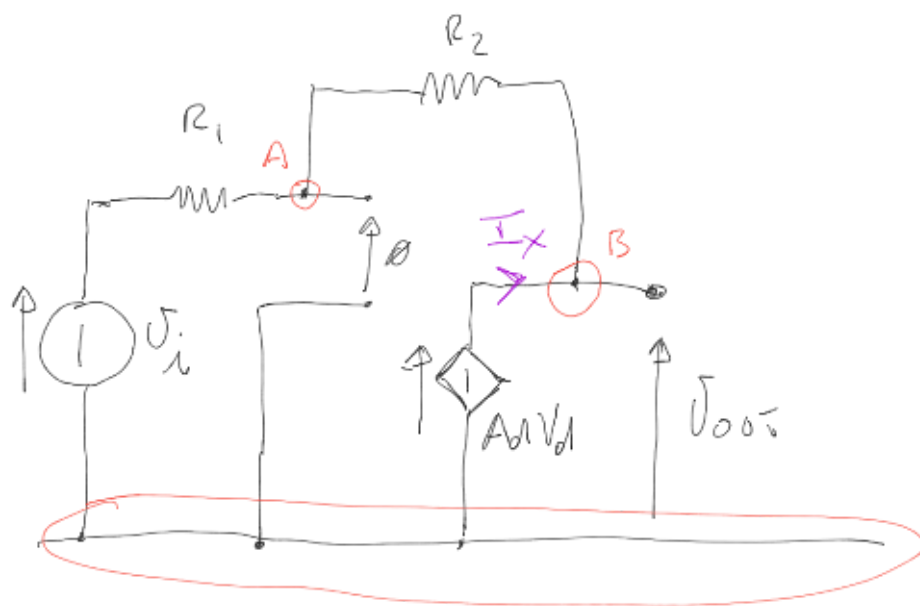
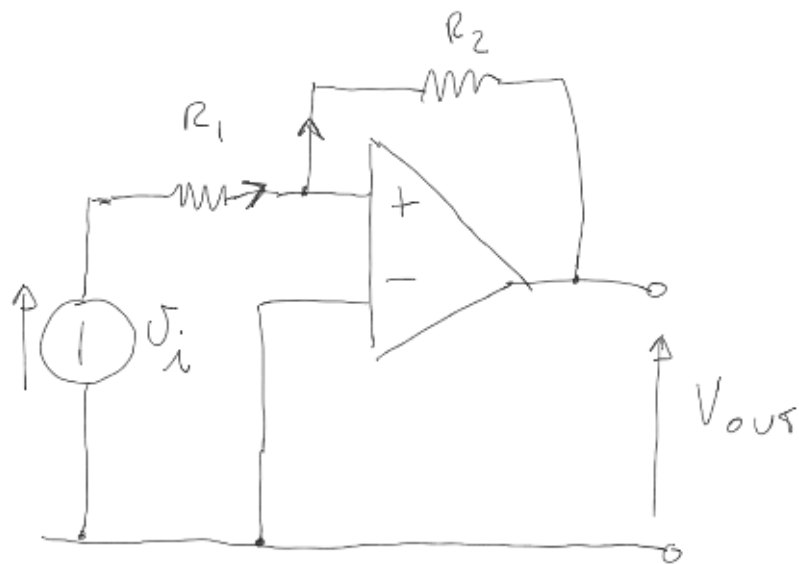


## MODELLO IDEALE



$$V_d = v_1 - v_2$$

# APP. OF CONFIGURATIONS INVERSE



$$\begin{matrix} & A & & B \\ A & \begin{bmatrix} G_1 + G_2 \\ -G_2 \end{bmatrix} & & \begin{bmatrix} -G_2 \\ G_2 \end{bmatrix} \\ B & & & \end{matrix} \begin{bmatrix} V_A \\ V_B \end{bmatrix} = \begin{bmatrix} \frac{V_i}{R_1} \\ I_X \end{bmatrix}$$

— A

B

77

7

7

7

7

7

$$\begin{bmatrix} A & B \end{bmatrix} \begin{bmatrix} G_1 + G_2 & -G_2 \\ -G_2 & G_2 \end{bmatrix} \begin{bmatrix} 0 \\ V_{out} \end{bmatrix} = \begin{bmatrix} \frac{V_i}{R_1} \\ I_X \end{bmatrix}$$

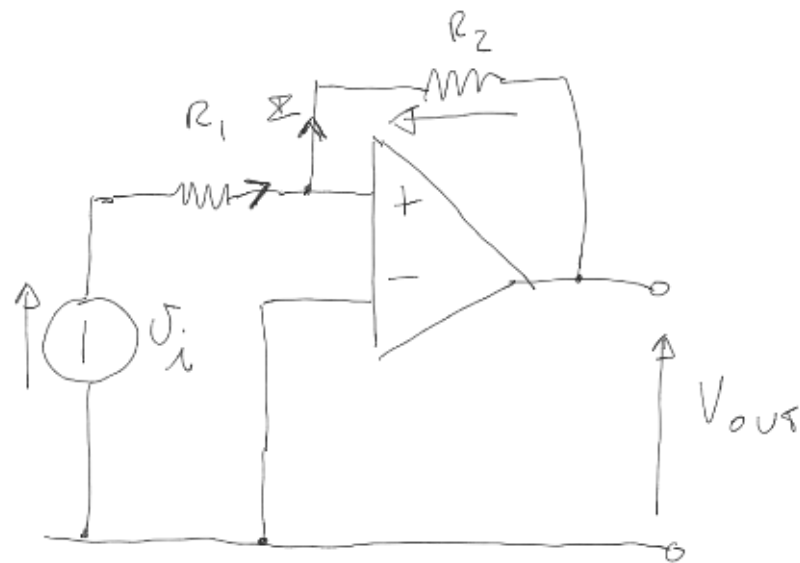
$$\cancel{\begin{bmatrix} G_1 + G_2 \\ -G_2 \end{bmatrix}} + \begin{bmatrix} -G_2 \\ G_2 \end{bmatrix} V_{out} = \begin{bmatrix} \frac{V_i}{R_1} \\ 0 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} I_X$$

$$\begin{bmatrix} -G_2 \\ G_2 \end{bmatrix} V_{out} + \begin{bmatrix} 0 \\ -1 \end{bmatrix} I_X = \begin{bmatrix} \frac{V_i}{R_1} \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} -G_2 & 0 \\ G_2 & -1 \end{bmatrix} \begin{bmatrix} V_{out} \\ I_X \end{bmatrix} = \begin{bmatrix} \frac{V_i}{R_1} \\ 0 \end{bmatrix}$$

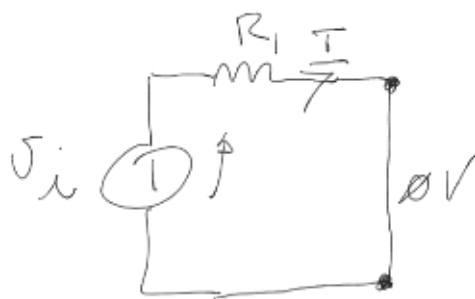
$$-G_2 V_{out} + \cancel{0 \cdot I_X} = \frac{V_i}{R_1}$$

$$V_{out} = -\frac{V_i}{R_1 G_2} = -\frac{R_2}{R_1} V_i$$



$$+V_{out} + R_2 \Sigma = 0$$

$$V_{out} = -R_2 \Sigma$$



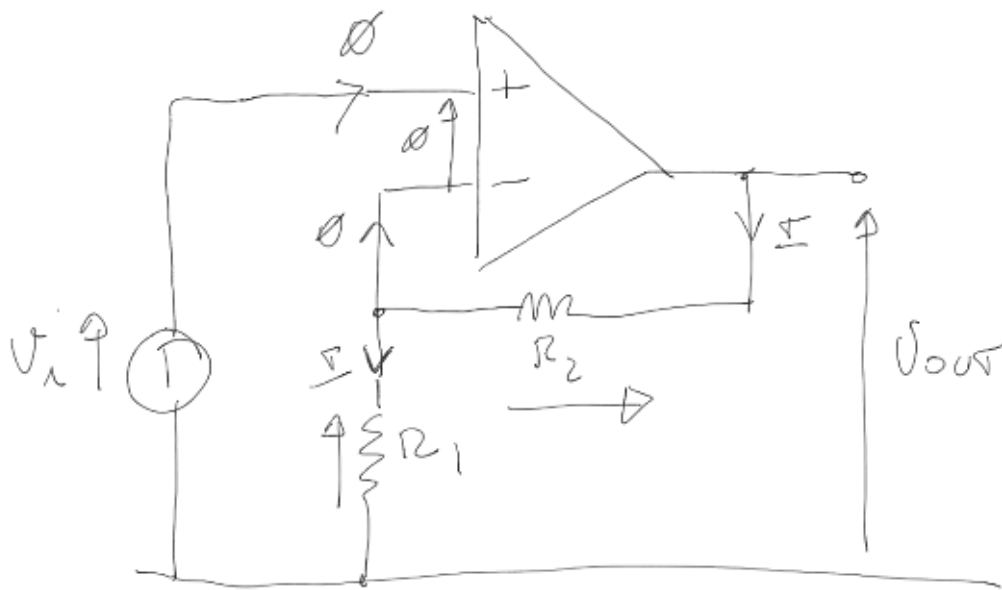
$$I_i = R_1 \Sigma$$

$$\Sigma = \frac{I_i}{R_1}$$

$$V_{out} = -R_2 \frac{I_i}{R_1}$$



AMP OPERAZIONALE NON INVERTENTE



$$V_{out} - R_2 \Sigma - R_1 \Sigma = 0$$

$$V_{out} = (R_1 + R_2) \Sigma$$

$$V_i - R_1 \Sigma = 0 \Leftrightarrow \Sigma = \frac{V_i}{R_1}$$

$$V_{out} = \left( \frac{R_1 + R_2}{R_1} \right) V_i$$