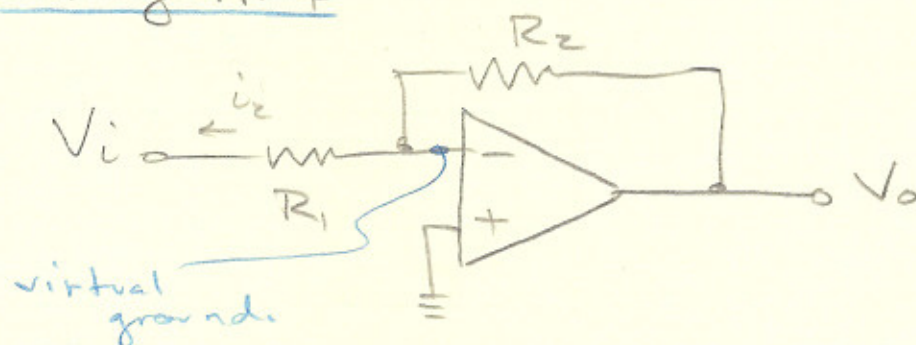


Inverting Amp

note: there is neg feedback

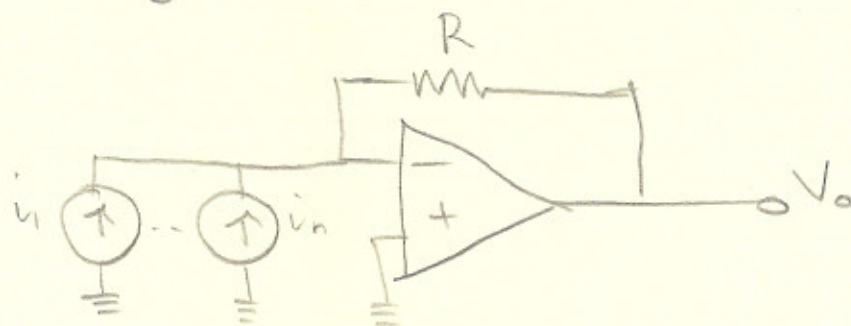
$$i_2 = \frac{V_o - V_i}{R_1 + R_2}$$

$$V_{ID} = 0$$

$$i_2 = -\frac{V_i}{R_1}$$

$$i_2 = \frac{V_o - 0}{R_2}$$

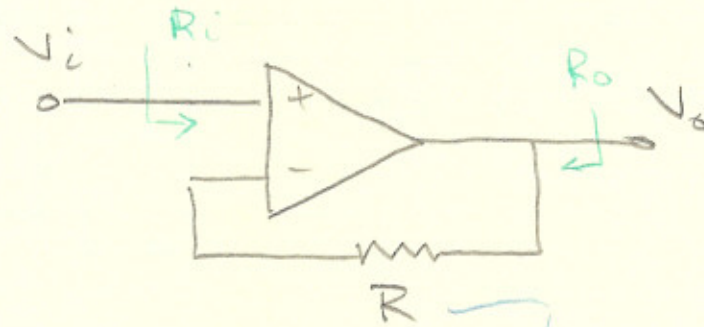
$$V_o = -\frac{R_2}{R_1} V_i$$

Summing Amp

$$V_o = -\sum_{j=1}^n i_j R$$

$$V_o = -i_f R$$

Voltage buffer

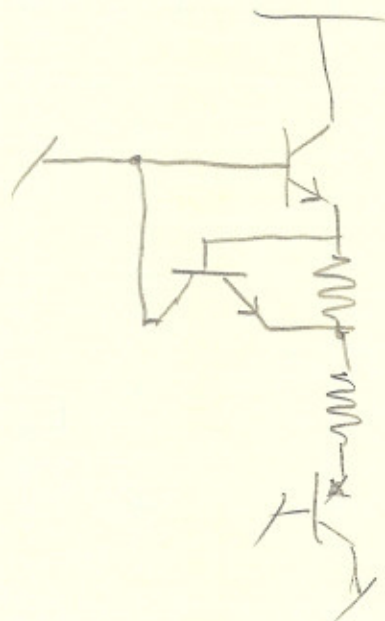


Has no effect.

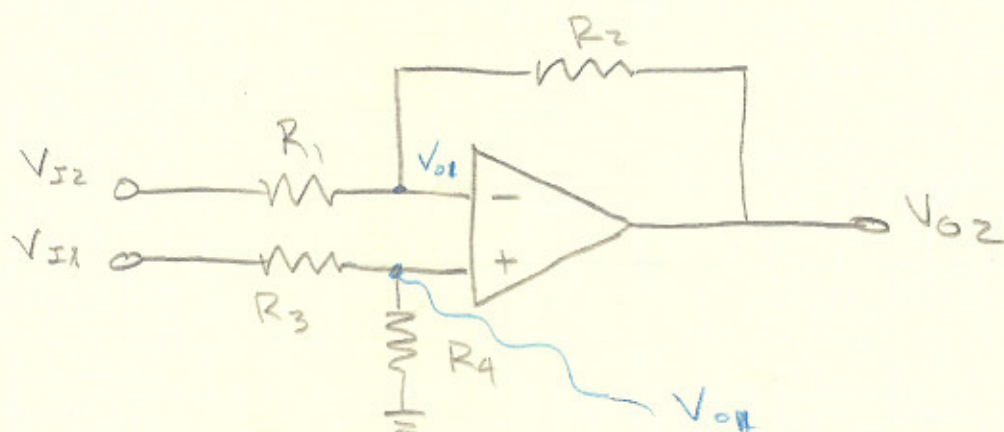
$$\left. \begin{array}{l} R_i \sim \infty \\ R_o \sim 0 \end{array} \right\} \text{In theory.}$$

* max current out of omp amp $\sim 15\text{mA}$.

current limiting o/p of omp amp.



Differential Op amp



$$V^+ = \frac{R_4}{R_3 + R_4} V_{I1}$$

$$V^- = V^+$$

$$\frac{V_{I2} - V^-}{R_1} = \frac{V^- - V_{O2}}{R_2}$$

$$\frac{V_{I2} - V^-}{V^- - V_{O2}} = \frac{R_1}{R_2}$$

$$\therefore V_O = \frac{R_2}{R_1} (V_{I1} - V_{I2})$$

Current Sources

