Operational Amplifiers

$+vin$ V_+

$-Vin$ V_- Va

— AAA — dissipation
cutoff
point

V_{in} R_1 V_{out}

R_c

Non-Inverting Amp (?)

$A_0 \to \infty$
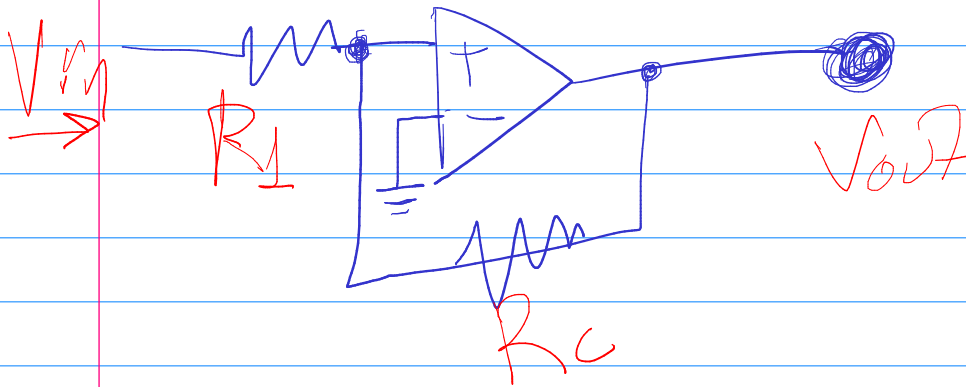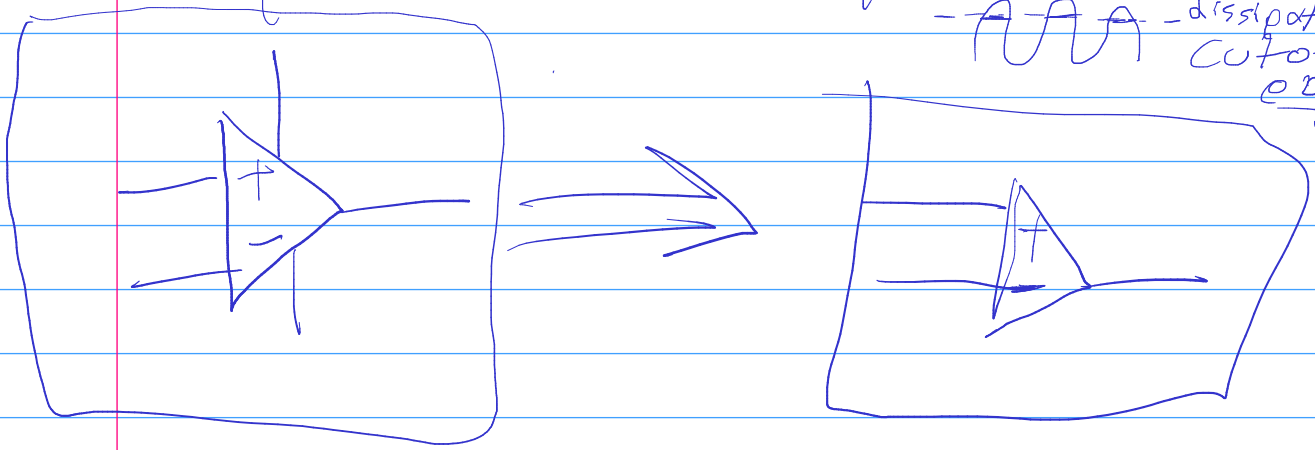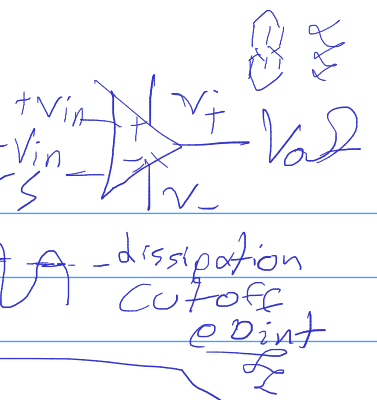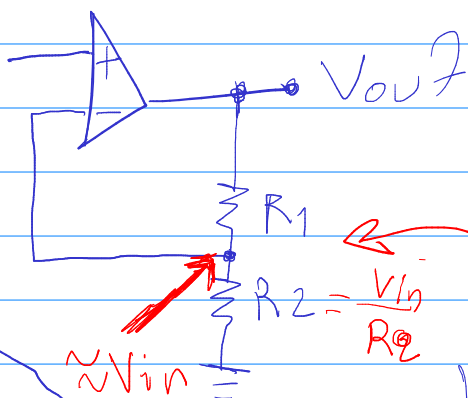
V_{out}

feedback goes to $(-)$
always(?)

fair enough?

R_1

$R_2 = \frac{V_{in}}{R_2}$

$\sim Vin$

$V_{1in} \sim V_{2in}$

$$V_{out} = (V_{in_1} - V_{in_2}) A_0$$

finite   very small   very large

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

Voltage Gain:

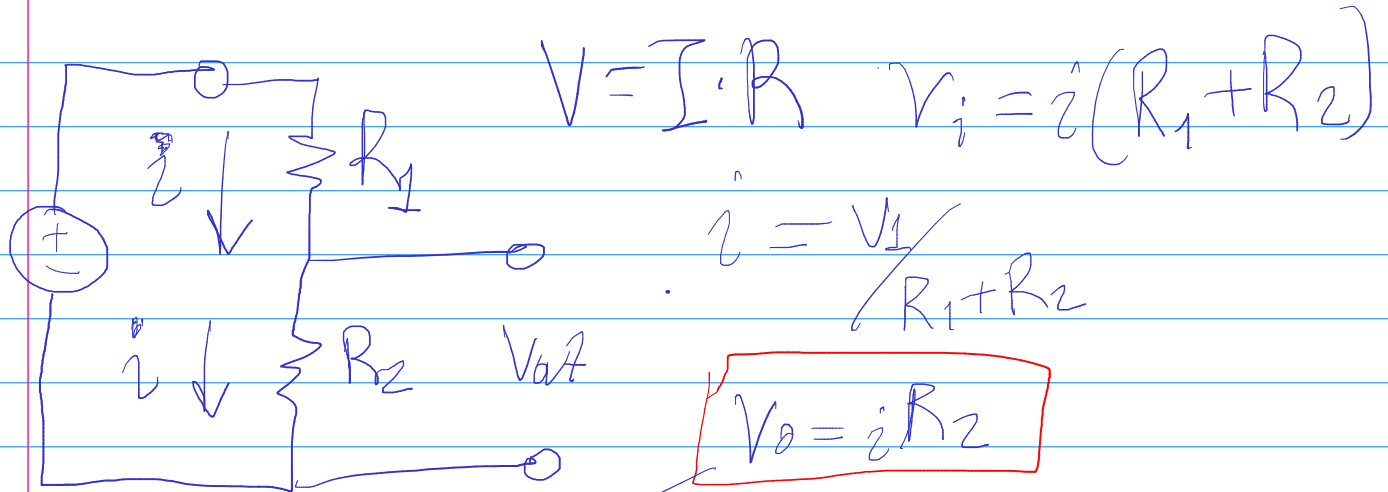$$\frac{V_{out}}{V_{in}} = 1 + \frac{R_1}{R_2}$$

Ground:

A point of reference for voltage, A dump for current.

Case 2: A₀ not very high

Voltage Divider:

Allows you to div the voltage between 2 resistors. Therefore allowing you to step down the voltage, from a power supply. To any other voltage you require.

$$V = I \cdot R \qquad V_i = i(R_1 + R_2)$$

$$i = \frac{V_1}{R_1 + R_2}$$

$$\boxed{V_0 = i R_2}$$

$$i = \frac{V_0}{R_2}$$

μετράμε τα Vout που αφορά τον R_2

MONO

Since: i is the same cause it's a series circuit & same everywhere so.

$$\frac{V_0}{R_2} = \frac{V_i}{R_1 + R_2} \Rightarrow V_{out} = \left(\frac{V_i}{R_1 + R_2}\right) \cdot R_2$$

IMPORTANT or $$\boxed{V_i = \frac{R_2}{R_1 + R_2}}$$