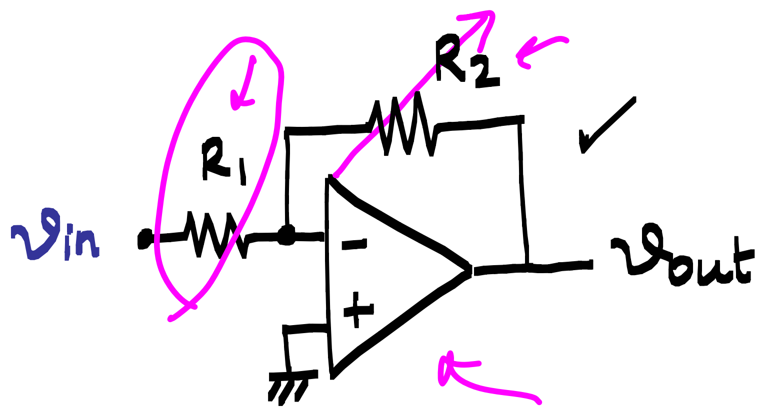
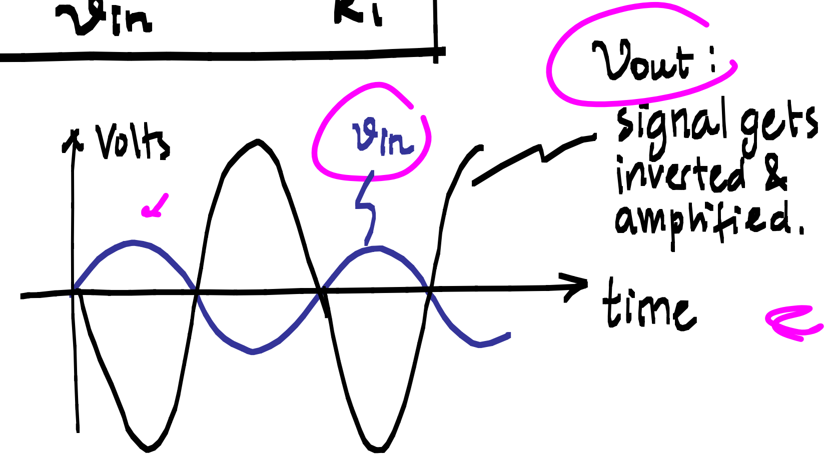
BRIEF CONTACT WITH AMPLIFIER DESIGN

INVERTING AMPLIFIER

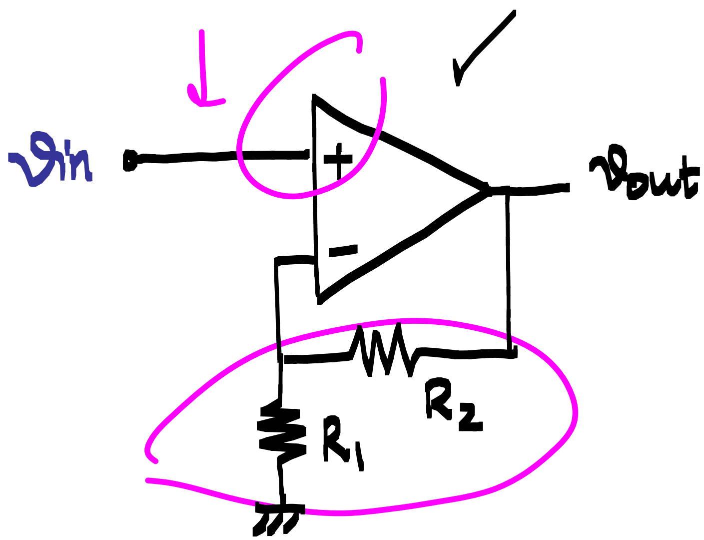
Gain: $\frac{v_{out}}{v_{in}} = \frac{-R_2}{R_1}$

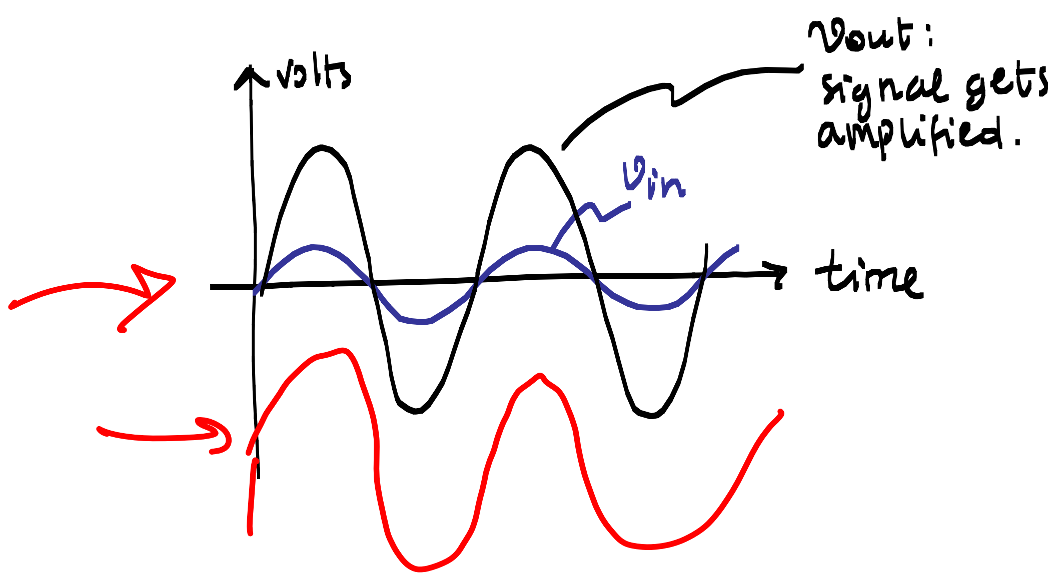




NON-INVERTING AMPLIFIER

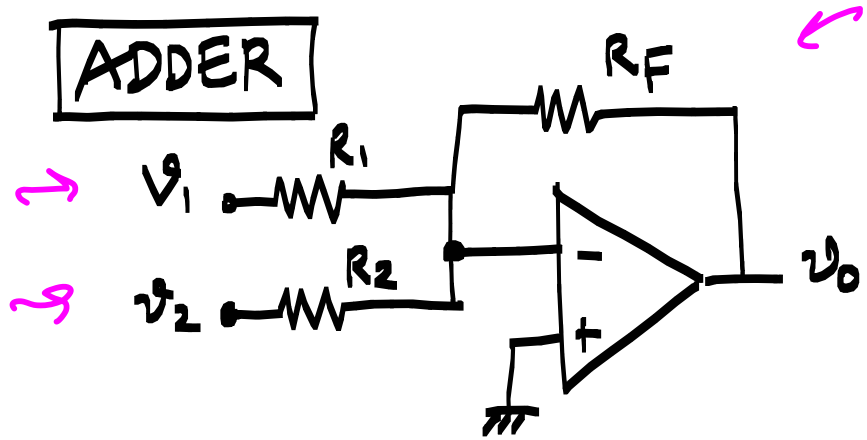
Gain: $\frac{v_{out}}{v_{in}} = 1 + \frac{R_2}{R_1}$





BRIEF CONTACT WITH AMPLIFIER DESIGN

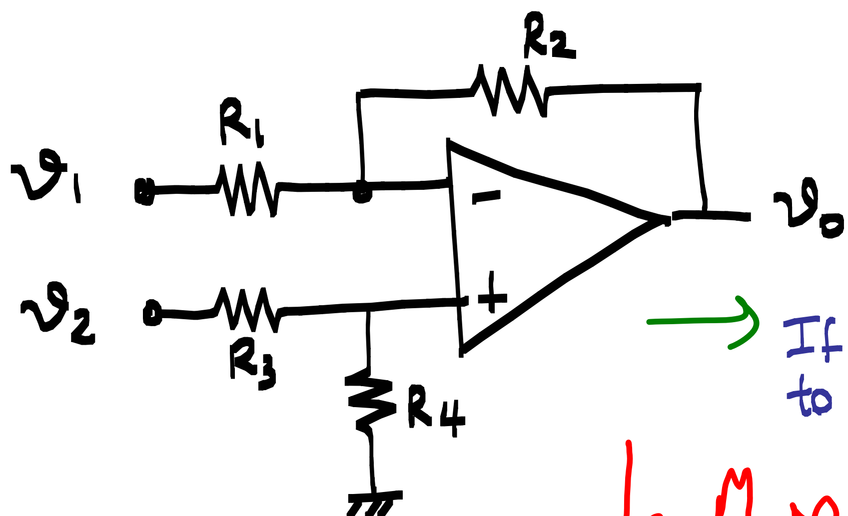
ADDER



$$v_o = v_1\left(-\frac{R_F}{R_1}\right) + v_2\left(-\frac{R_F}{R_2}\right)$$

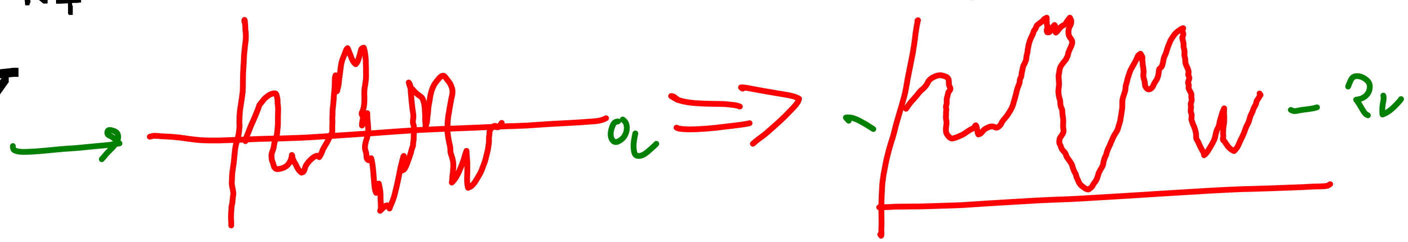
Use this topology to amplify the sum of two signals

DIFFERENTIAL AMPLIFIER

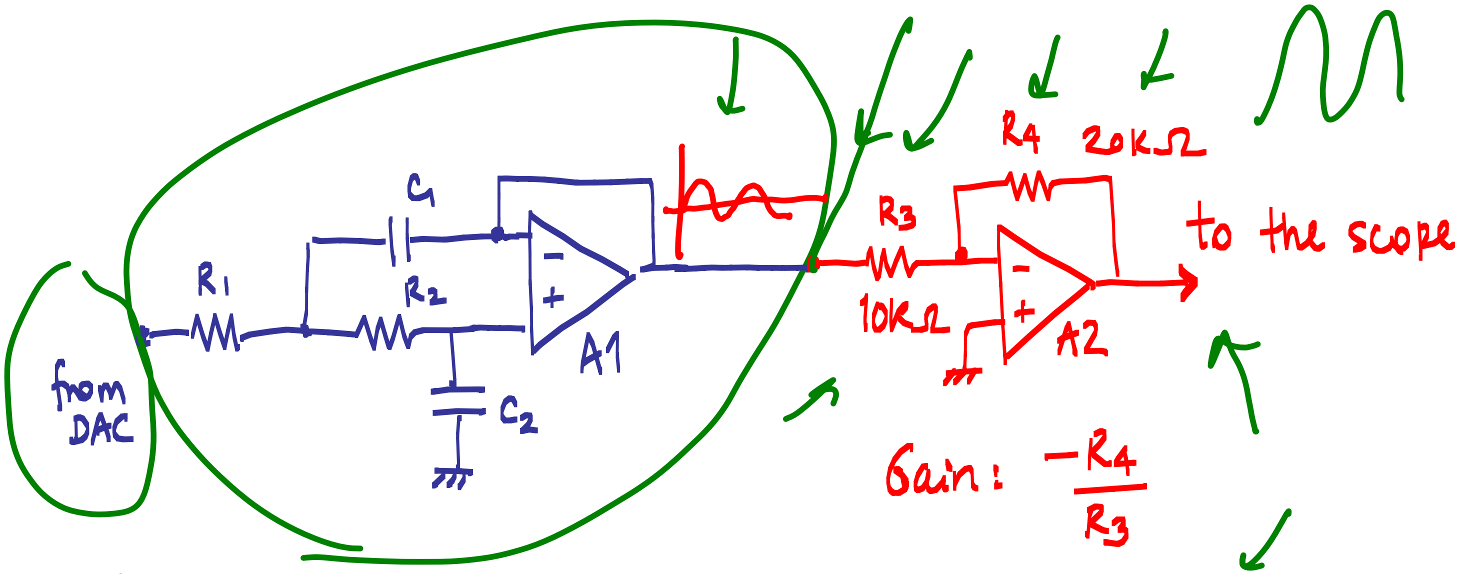


$$v_o = v_2\left[\frac{R_4}{R_3+R_4}\right]\left[1+\frac{R_2}{R_1}\right] - v_1\frac{R_2}{R_1}$$

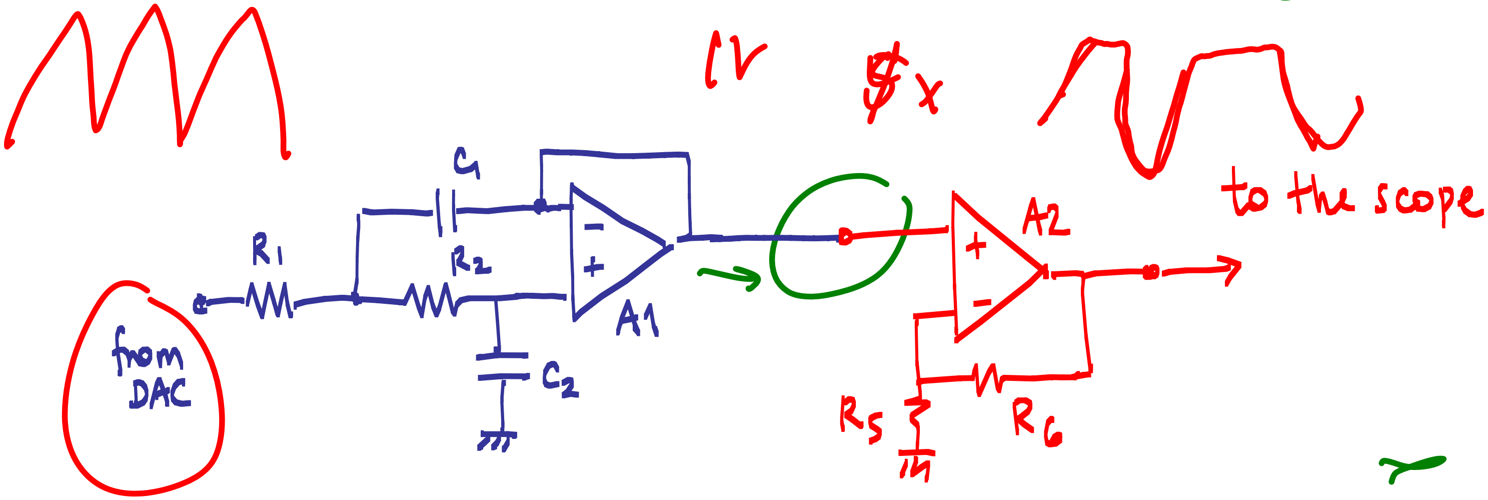
If v_2 is a DC value, you could use this topology to add an OFFSET to a signal



So, for instance, how would a filter followed by an amplifier look like?



In this one resistor R_3 poses a load to amplifier A1. It's important to consider that for the power requirements of R_3 (hence, R_3 can't be small)



In this one no load effect is imposed on A1 but if resistors R_5 & R_6 are small then A2 will have to provide the current for them.

Gain: $1 + \frac{R_6}{R_5}$

For gain of 2: $R_6 = R_5$