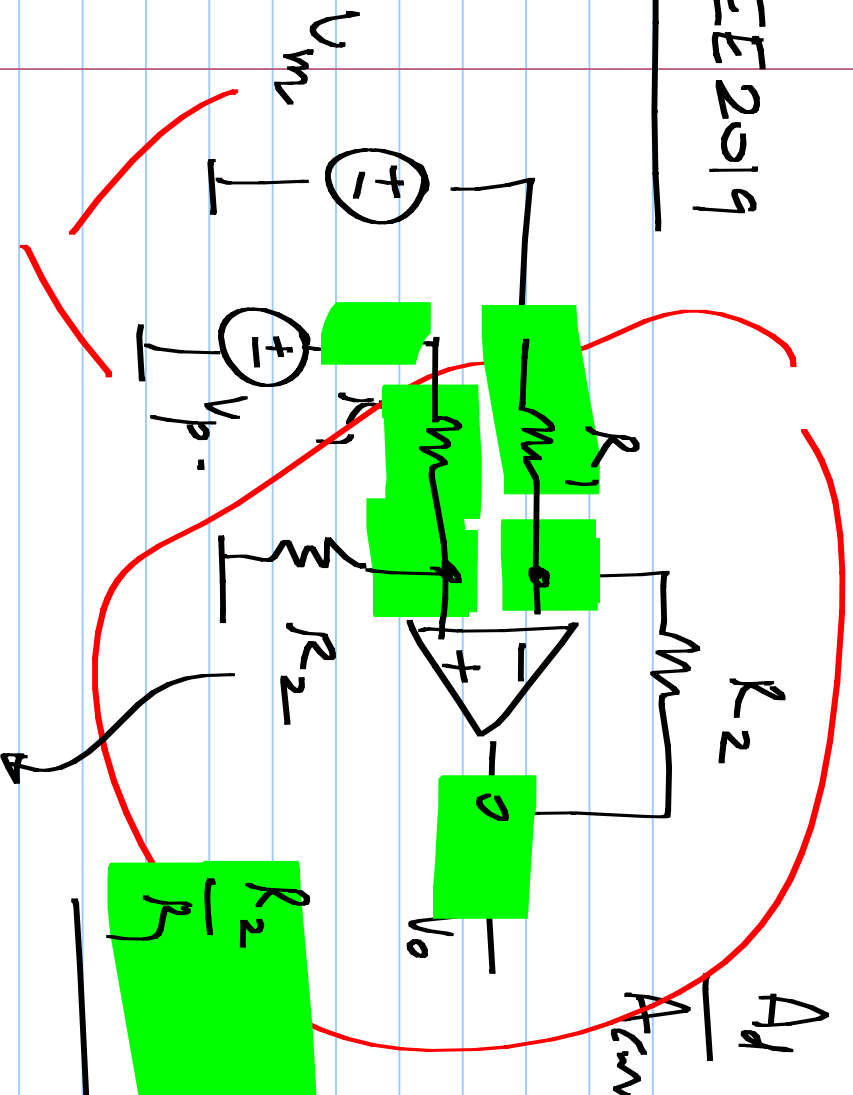


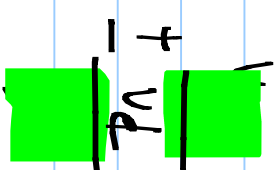
EE 2019



A_{cm}

PSRR · Power supply
CMRR

21/3/2017



$$A_d \cdot V_{cm} + A_{cm} \cdot V_{psrr}$$

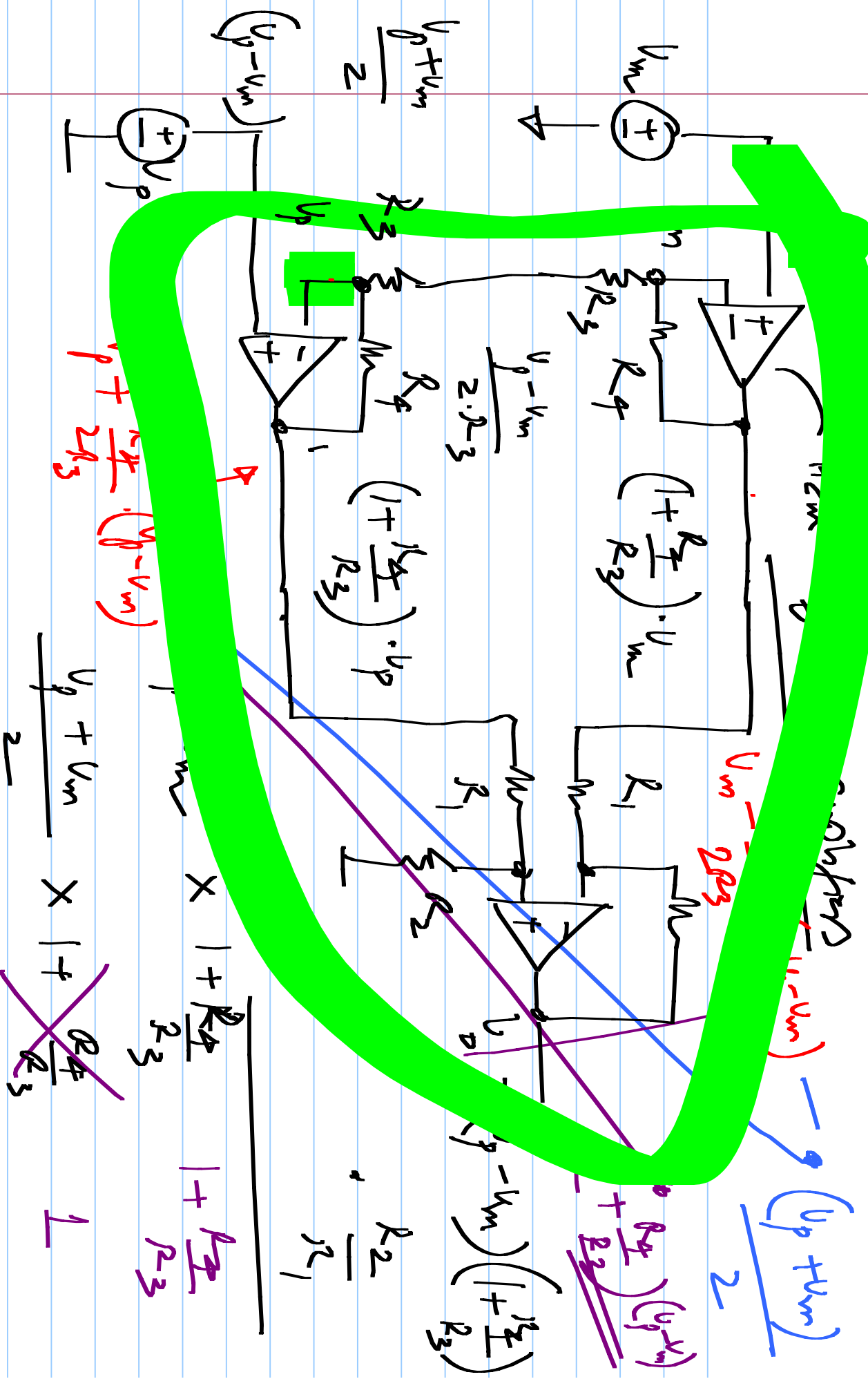
$$V_{cm} = \frac{V_p + V_o}{2}$$

$$V_o = (V_p - V_{cm})$$

$$\frac{R_2}{R_1} \cdot \left[1 + \frac{1}{A_d} \left(1 + \frac{R_2}{R_1} \right) \right] \cdot \frac{A_{cm}}{2A_d}$$

$$+ \left(\frac{V_p + V_{cm}}{2} \right) \cdot \frac{R_2}{R_1}$$

$$\frac{A_d}{A_{cm}}$$



w/ individual amplifiers

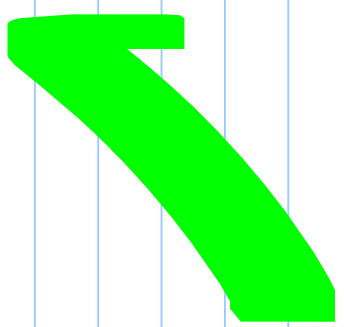
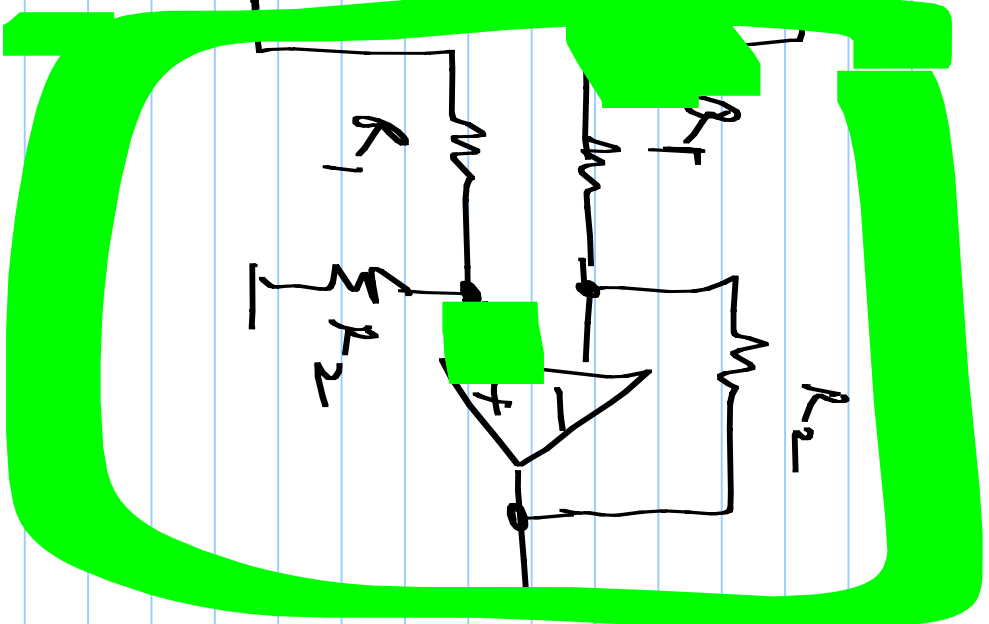
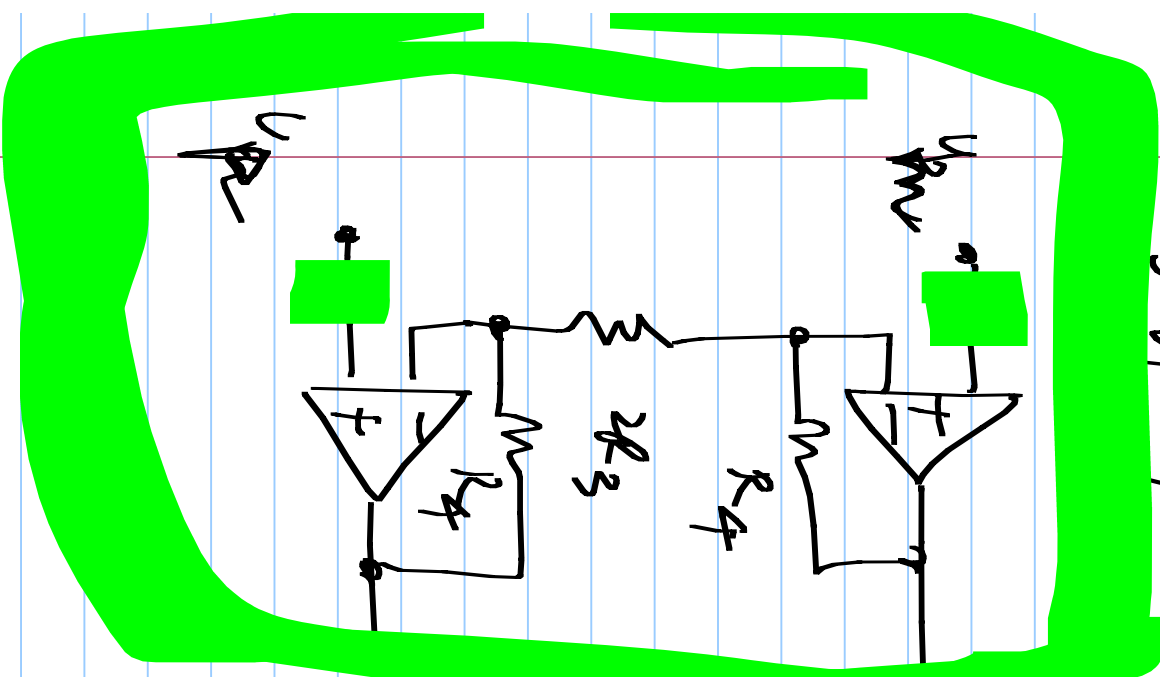
$$V_o = (V_p - V_m) \left(1 + \frac{R_2}{R_3} \right) \cdot \frac{R_2}{R_1} \cdot \frac{1}{\left(\frac{V_p + V_m}{2} \right) \left(1 + \frac{R_2}{R_3} \right) \cdot \frac{R_2}{A_m} \cdot \frac{1}{A_m} \left(\frac{1}{A_m} \right)}$$

w/ gnom) lifted up:

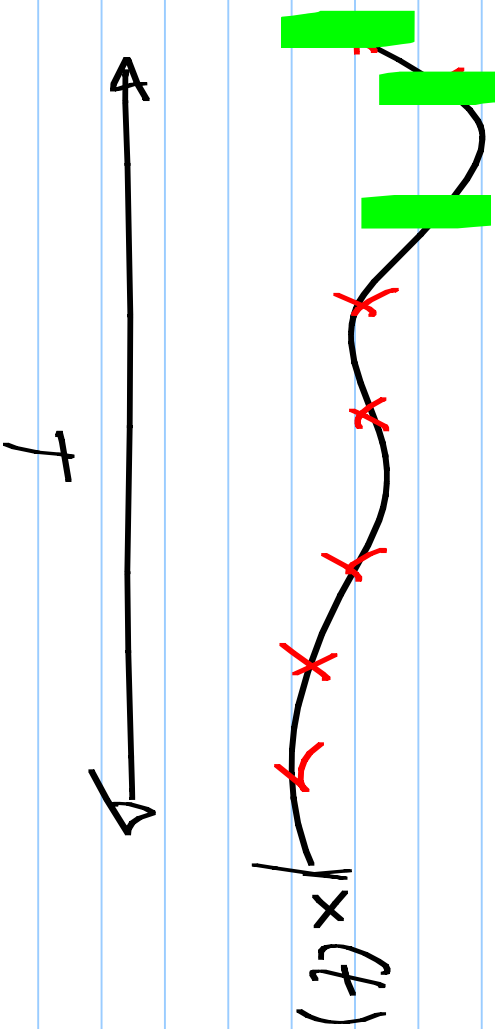
$$V_p = (V_p - V_m) \cdot \frac{R_2}{R_1} \cdot \frac{1}{\left(\frac{V_p + V_m}{2} \right)}$$

$$+ \left(\frac{V_p + V_m}{2} \right) \cdot \frac{R_2}{R_1} \cdot \frac{A_m}{A_m} \cdot \frac{1}{\left(\frac{1}{A_m} \right)}$$

3-opamp instrumentation amplifier



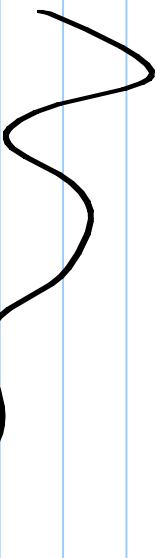
Filters using
controlled sources / opamps } Active filters



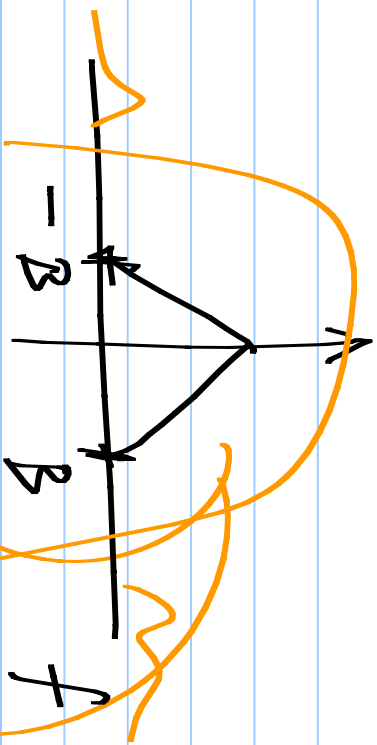
time

frequency

$x_c(t)$



$X_c(f)$

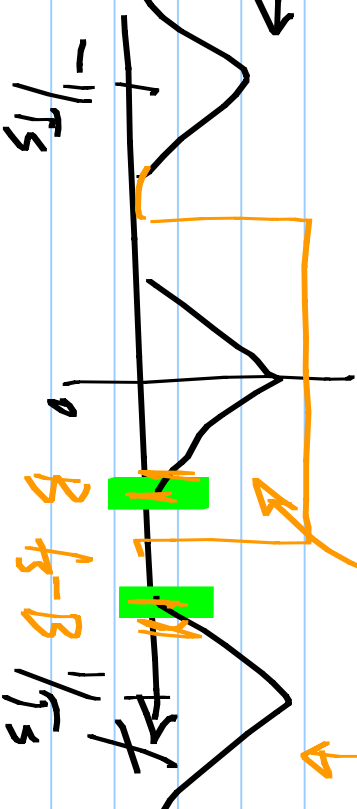


$x_s(t)$

$$\sum x(nT_s) \delta(t - nT_s)$$



$X_s(f)$



$$x_d[n] = x_c(nT_s)$$

$$\sum X_c\left(f - \frac{n}{T_s}\right)$$