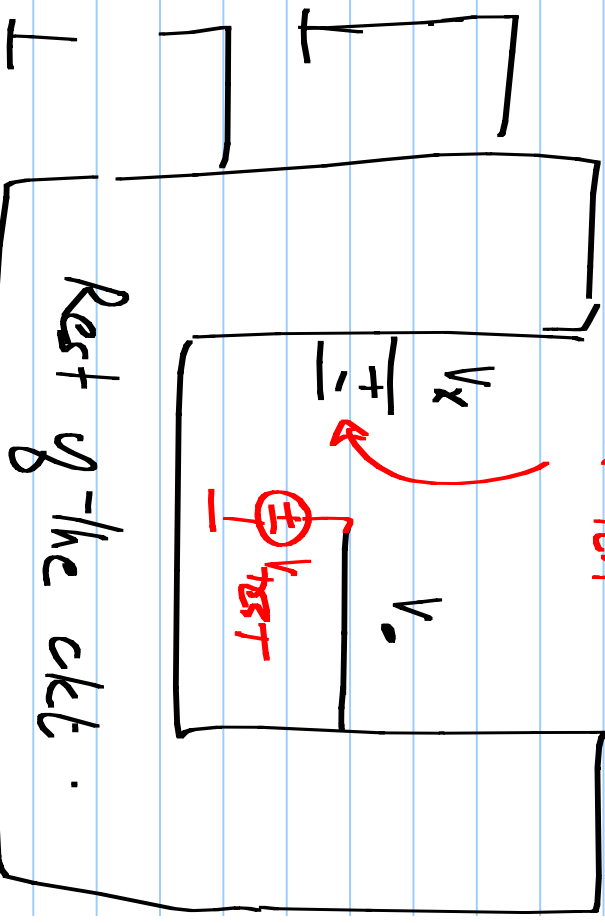
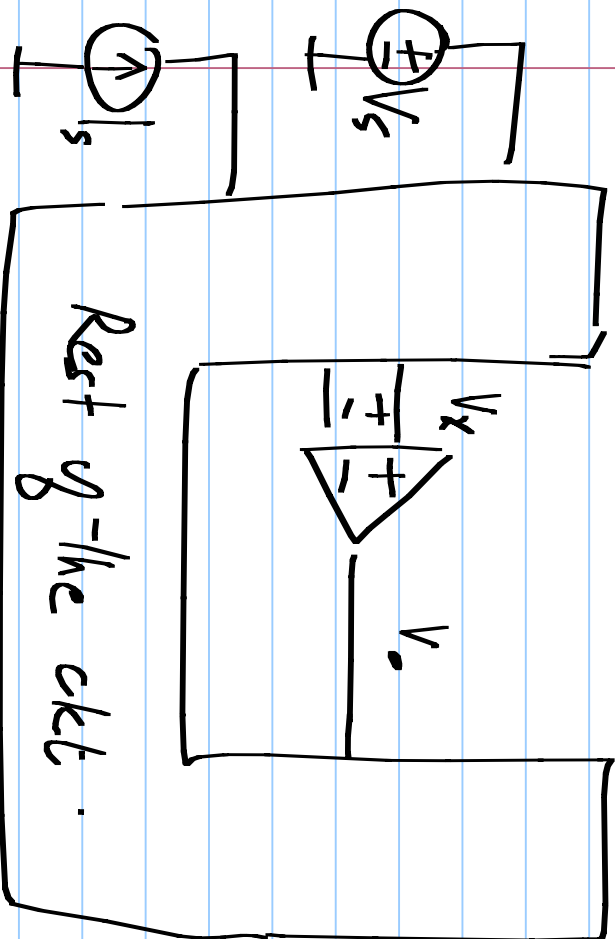
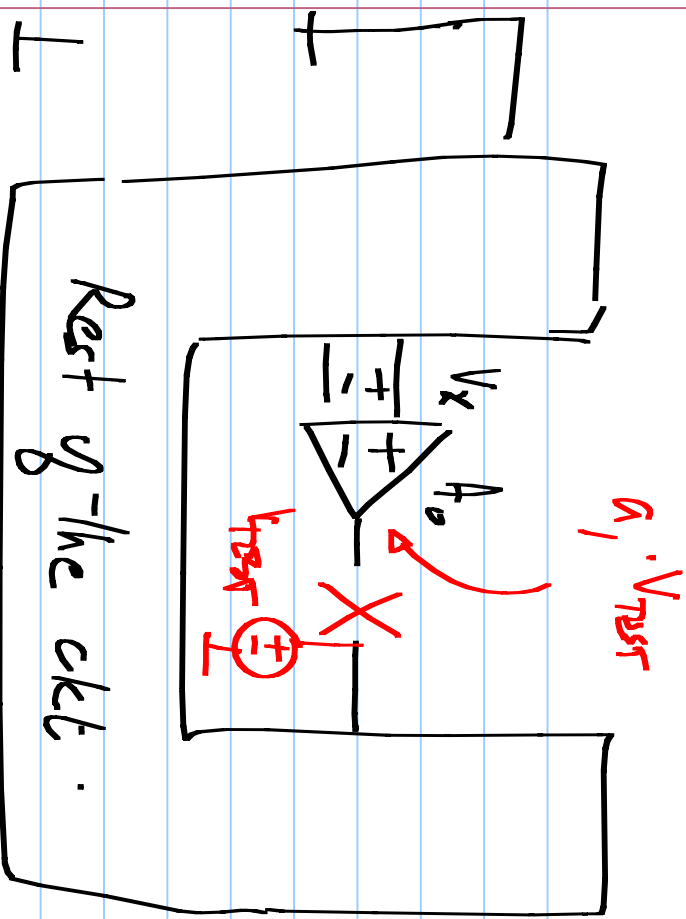


Lecture 20



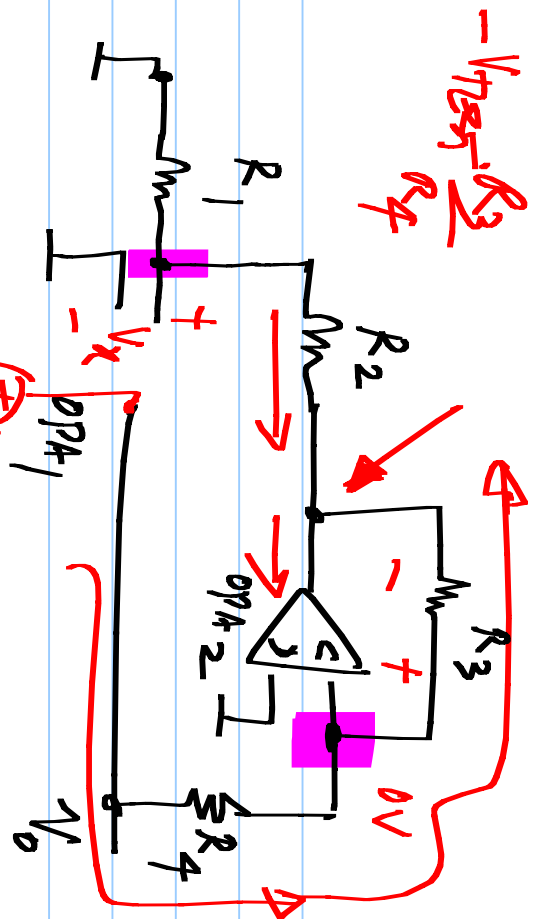
$$V_x = \alpha V_o + \beta V_s + \gamma I_s$$

$\alpha < 0$ for neg. fb.



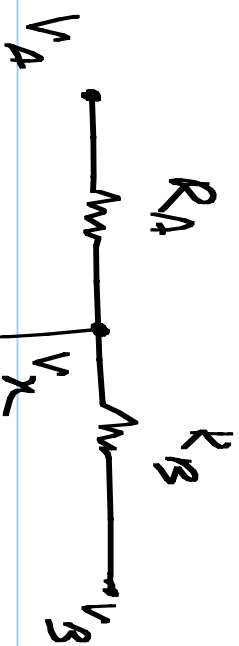
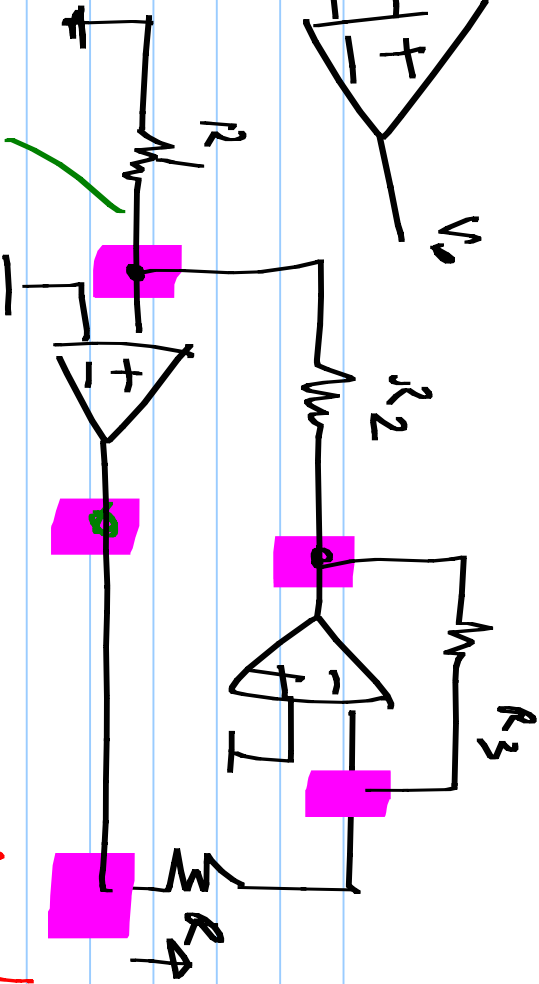
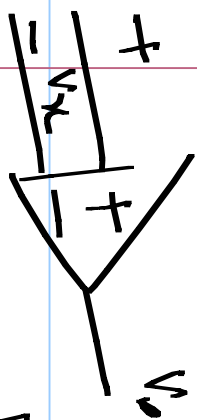
$$a_1 \cdot V_{test}$$

$$V_{test} \frac{R_3}{R_4} + V_{test} \frac{R_3}{R_4} \frac{1}{R_1 + R_2}$$



$$V_0 = -V_{test} \frac{R_3}{R_4} \frac{R_1}{R_1 + R_2}$$

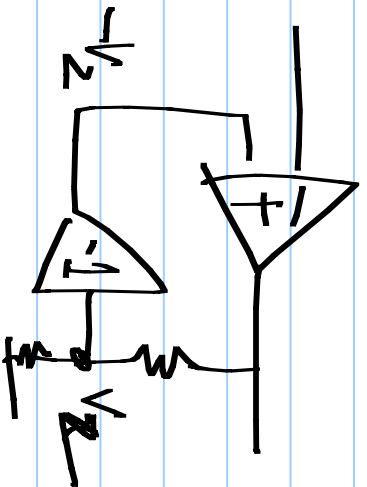
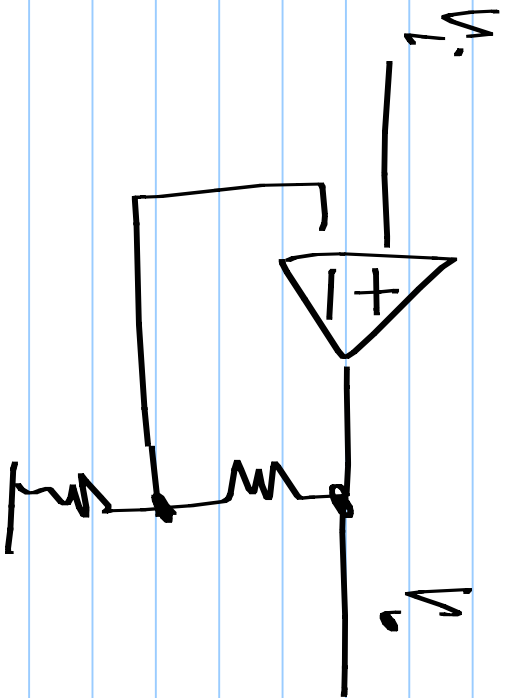




$$V_{out} = A_o \cdot \frac{R_1}{R_1 + R_2}$$

$$V_A \cdot \frac{R_B}{R_A + R_B}$$

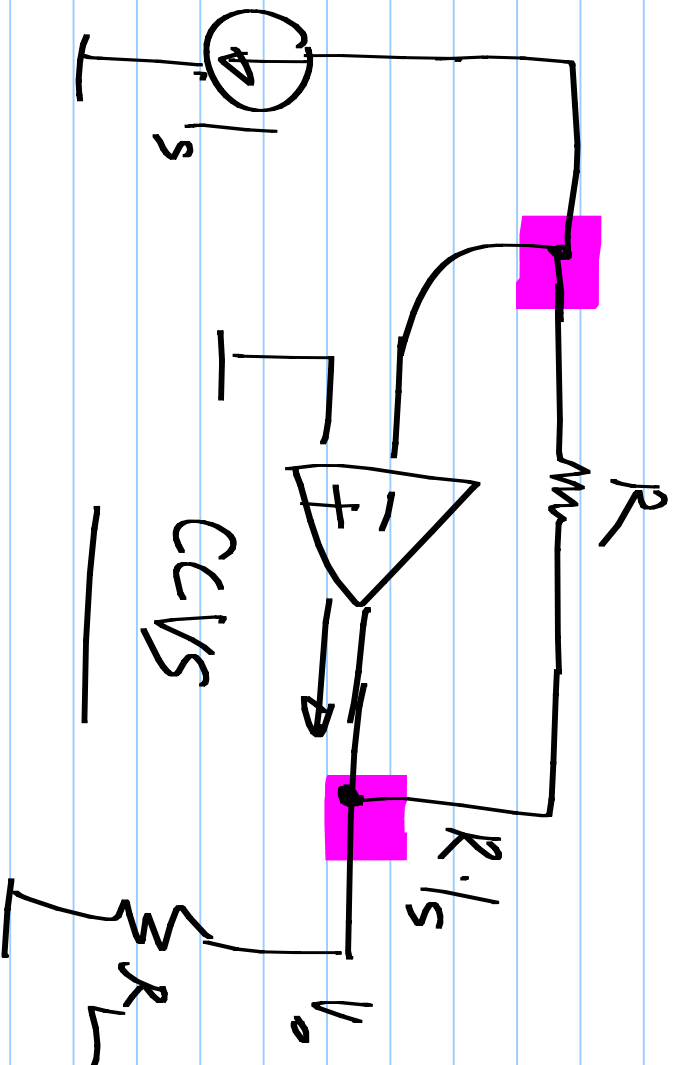
$$+ V_B \cdot \frac{R_A}{R_A + R_B}$$



input output

CCVS: I_s V_o

$V_o = (R) \cdot I_s$

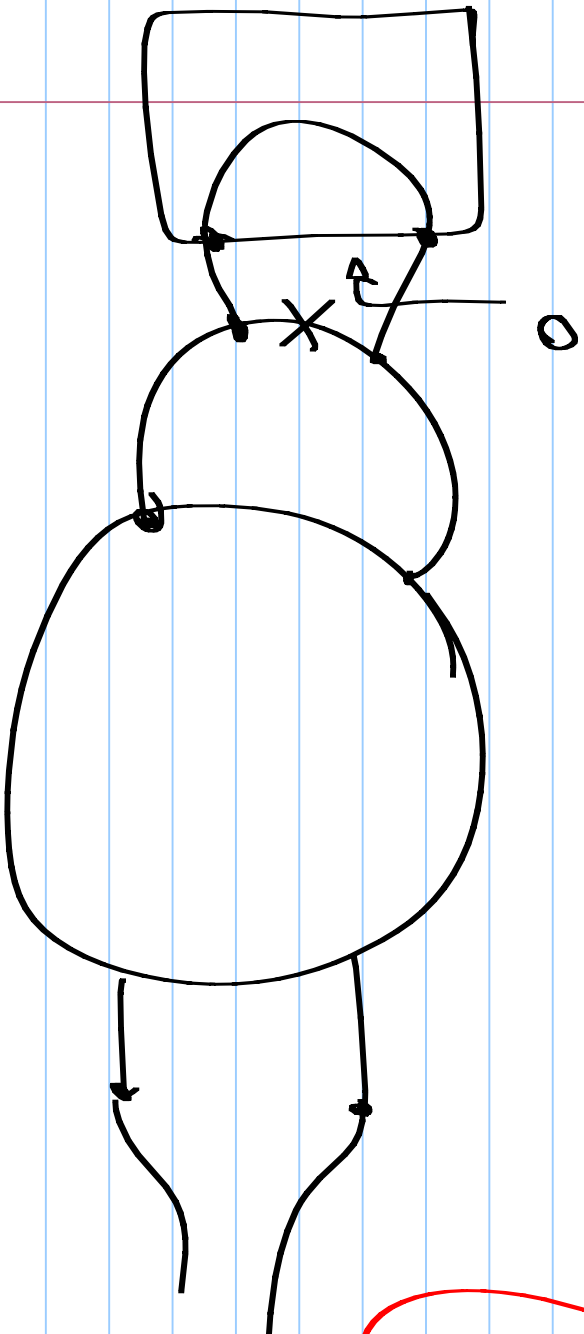


$V_o - R \cdot I_s = 0$

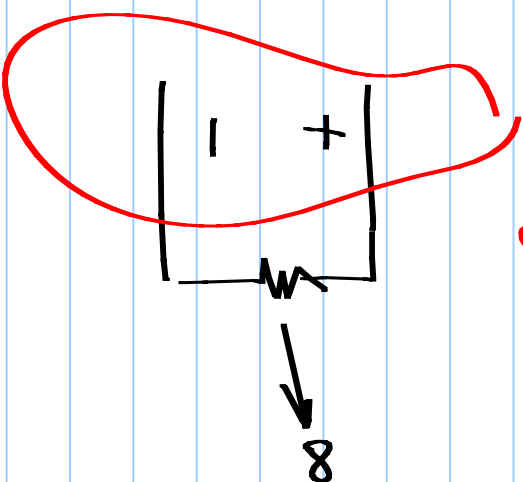
$V_o - R I_s > 0$

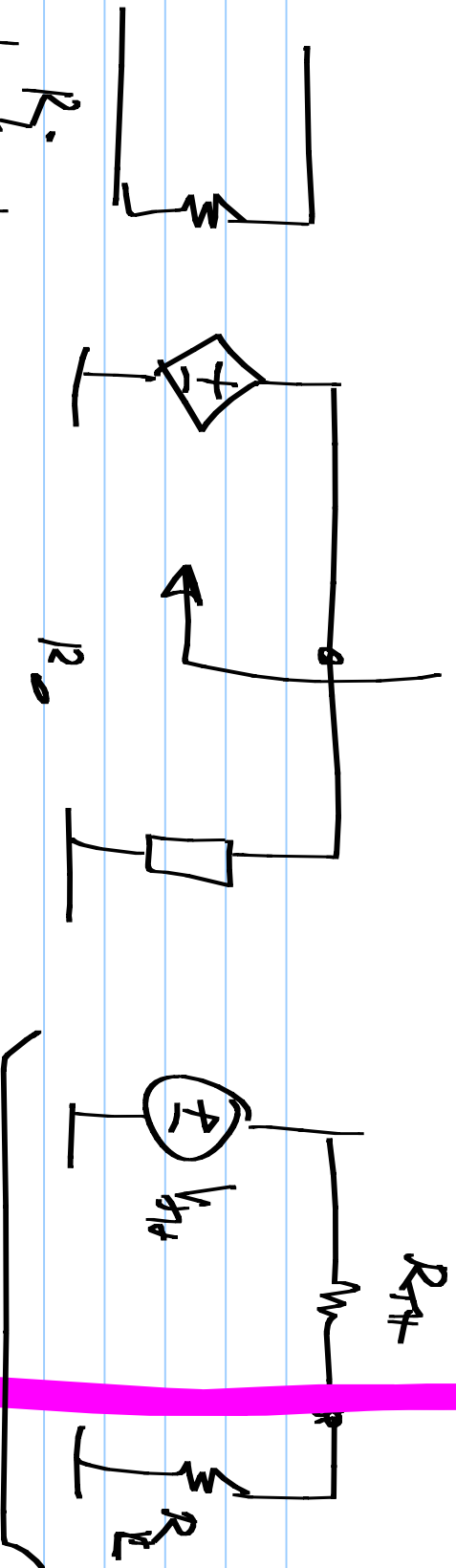
Controlling quantity

Voltage controlled



Sense the
Voltage





Input resistance o/p resistance

V_{CVS}	∞ (large)	0 (small)
V_{CCS}	∞ (large)	∞
C_{CVS}	0	0
C_{CCS}	0	∞

