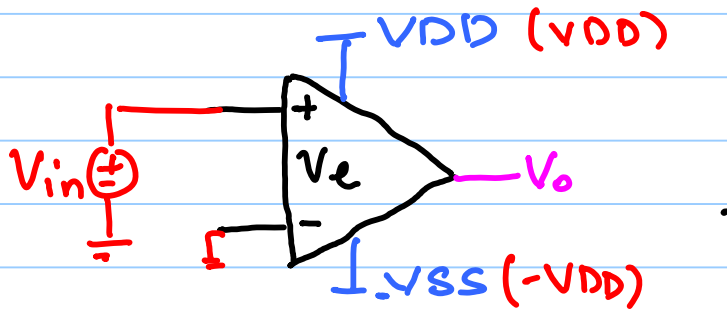
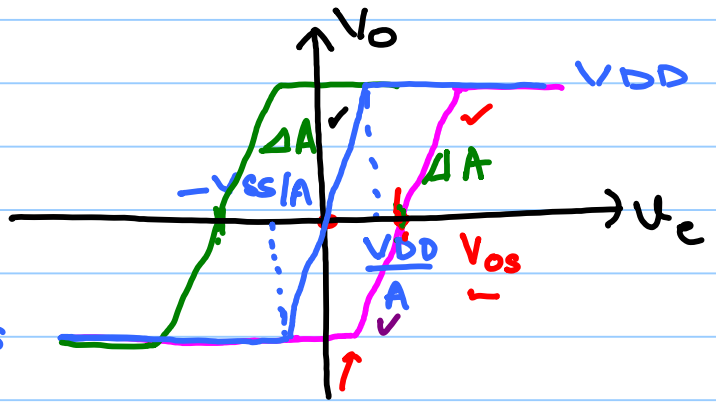
Lecture # 10

Note Title 18-02-2021

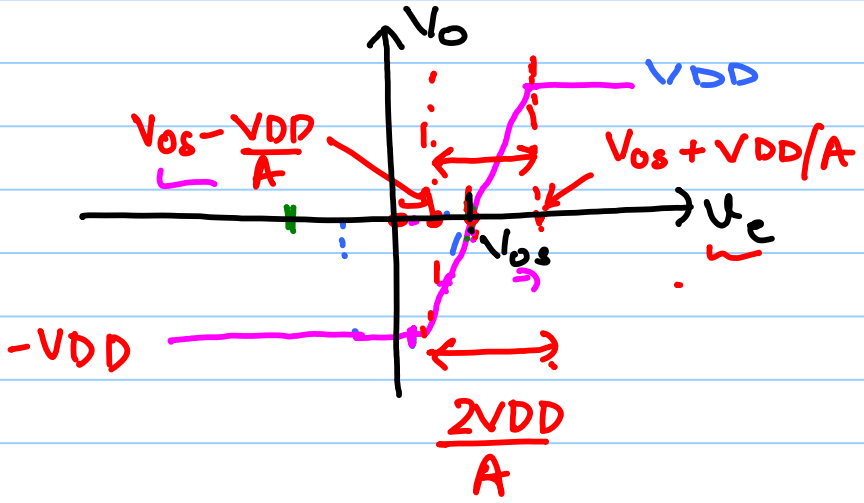


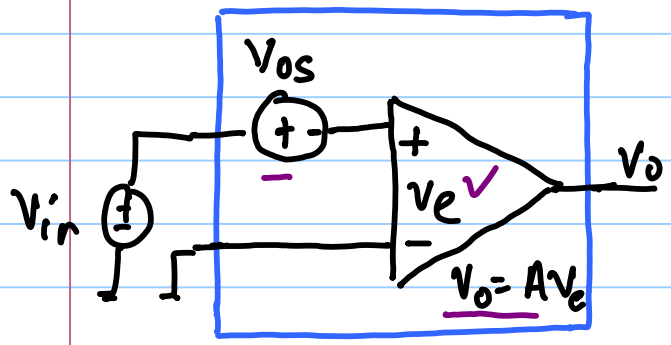
$V_o = A V_e$ ✓



$V_e = V_{in}$

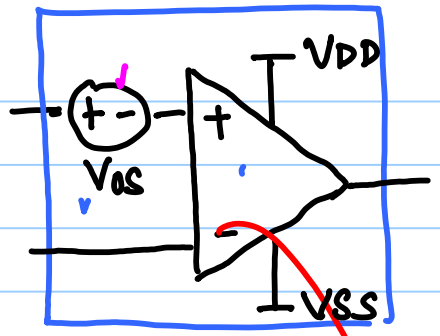
V_{os} : Input Offsed Voltage.

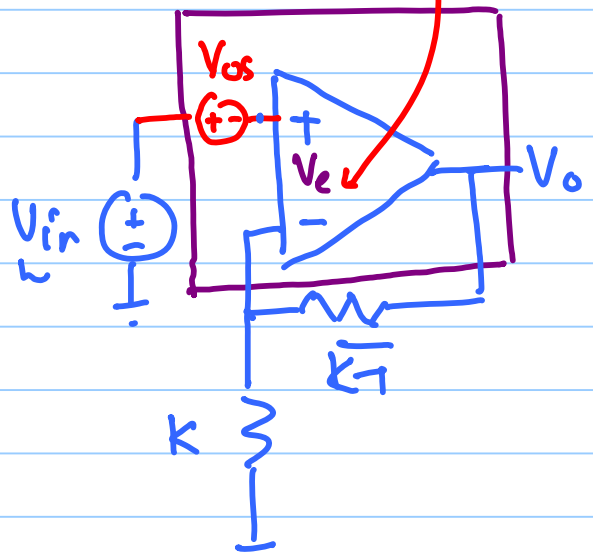




$V_e = V_{in} - V_{os}$

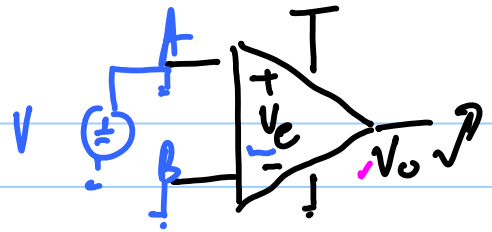
$V_o = A (V_{in} - V_{os}) = A V_e$



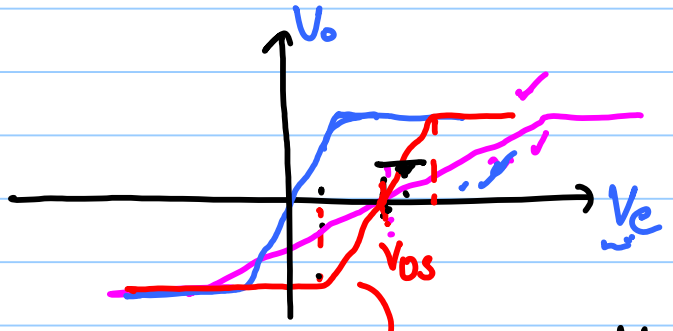


$$\frac{V_o}{V_{in}} = K$$

$$V_o = K V_{in}$$



$$V_o = A V_e$$

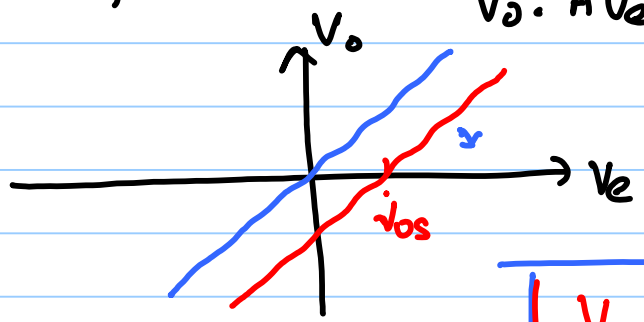


$V_{os} = 0.5V$

$$V_o = A V_e$$

$$\left(V_{in} - V_{os} - \frac{V_o}{K}\right) A = V_o$$

V_e



$$V_o = A V_e$$

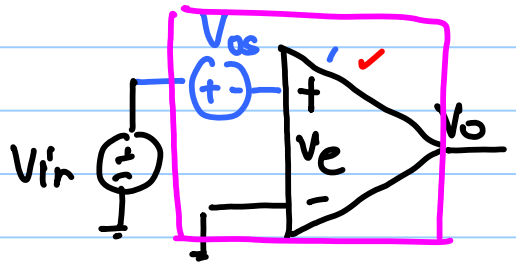
$$V_o = A(V_e - V_{os})$$

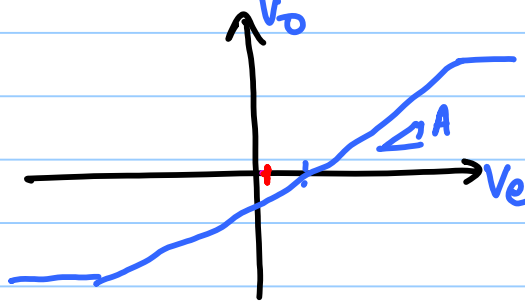
$$V_o = \frac{V_{in}}{\frac{1}{A} + \frac{1}{K}} - \frac{V_{os}}{\frac{1}{K} + \frac{1}{A}} = \frac{K V_{in}}{1 + K/A} - \frac{K V_{os}}{1 + K/A}$$

$$V_o = A V_e - A V_{os}$$

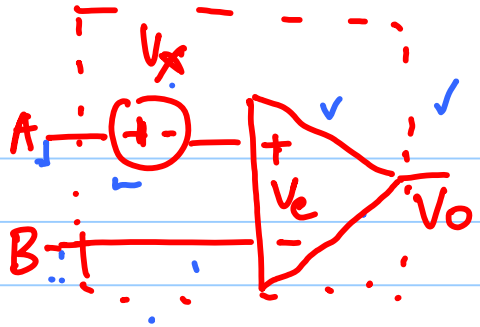
$$V_o = \frac{K V_{in}}{1 + K/A} - \frac{K V_{os}}{1 + K/A}$$

#1



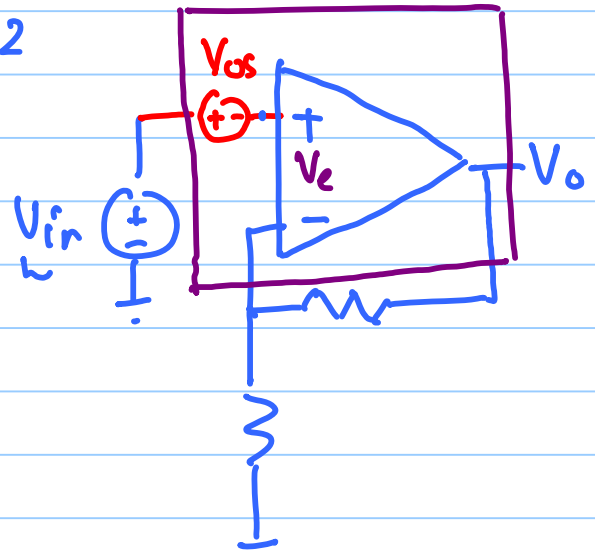


$$V_o = A(V_{in} - V_{os})$$
$$= AV_{in} - AV_{os}$$

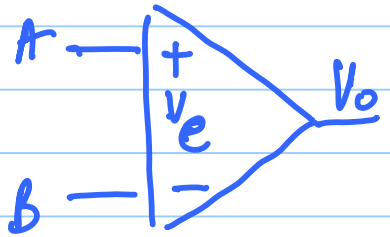


$$V_e = V_{AB} - V_x$$
$$V_o = A(V_{AB} - V_x)$$
$$\boxed{V_o = A(V_{AB} - V_{os})}$$

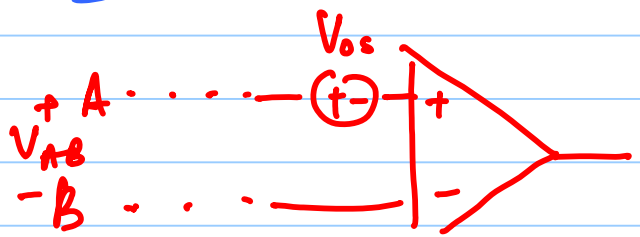
#2



$$V_o = \frac{K V_{in}}{1 + K/A} - \frac{K V_{os}}{1 + K/A}$$

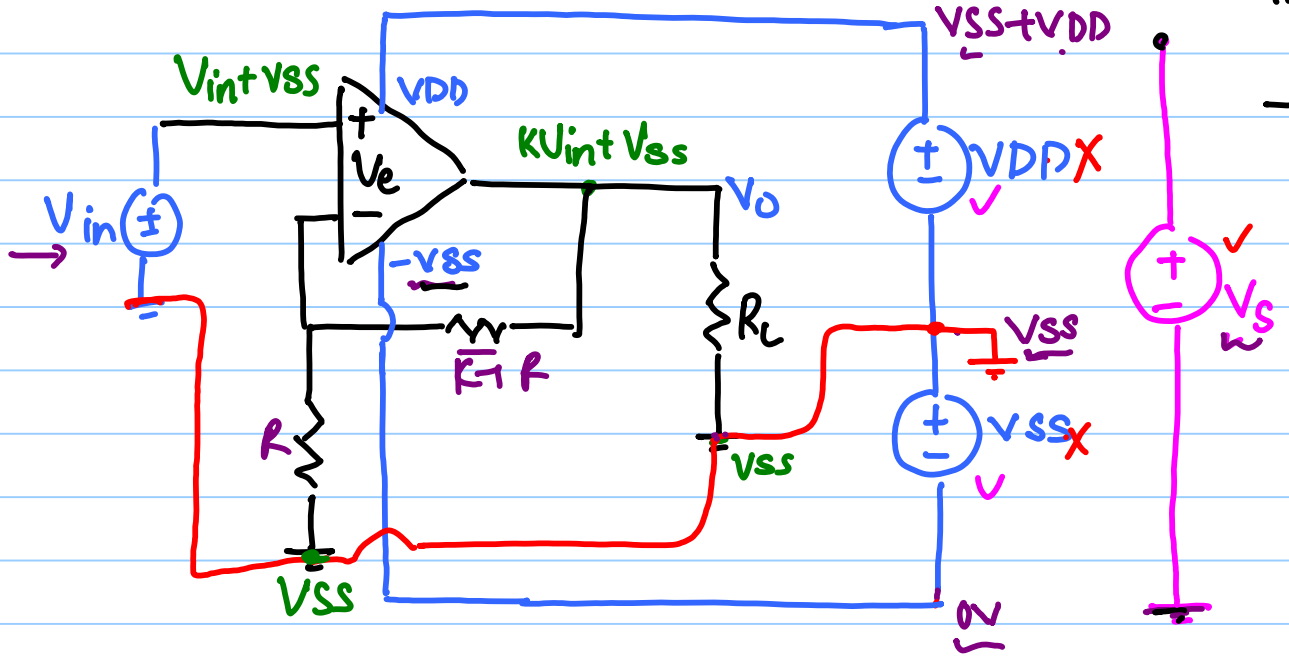


$$V_e = V_{AB}$$



"Offset Cancellation"

- Two supply voltages.



$V_s = VSS + VDD$ ✓