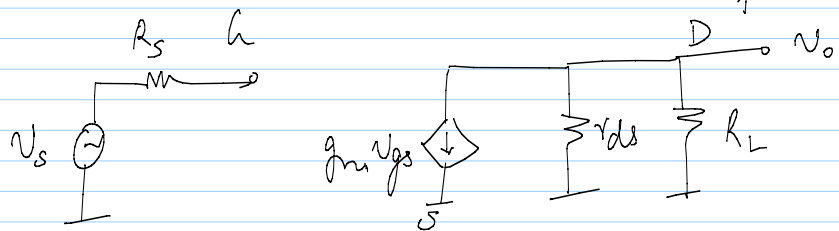
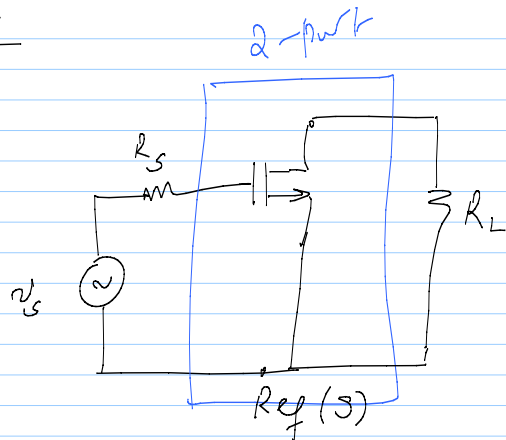
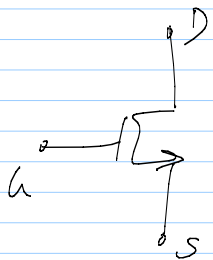


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lec 7



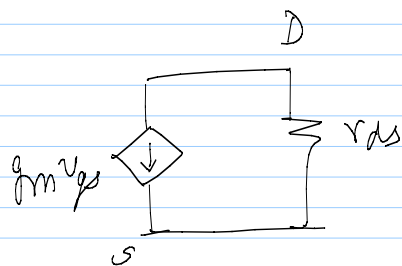
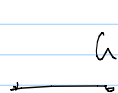
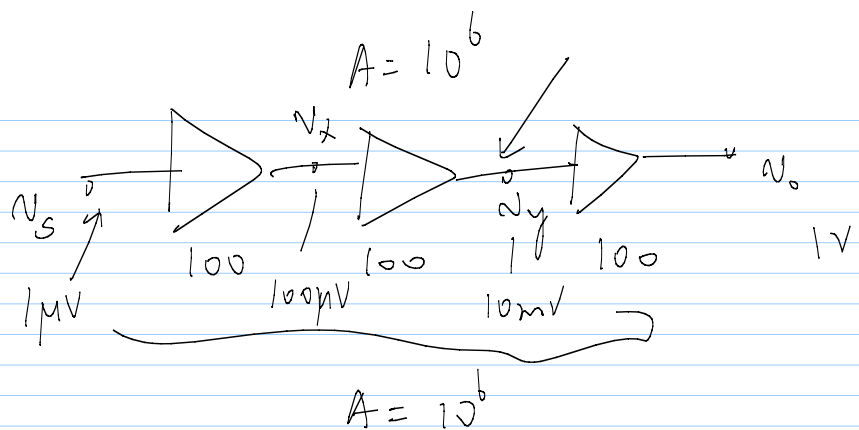
$$v_{gs} = v_s$$

$$v_o = -(g_m v_{gs}) (r_{ds} \parallel R_L)$$

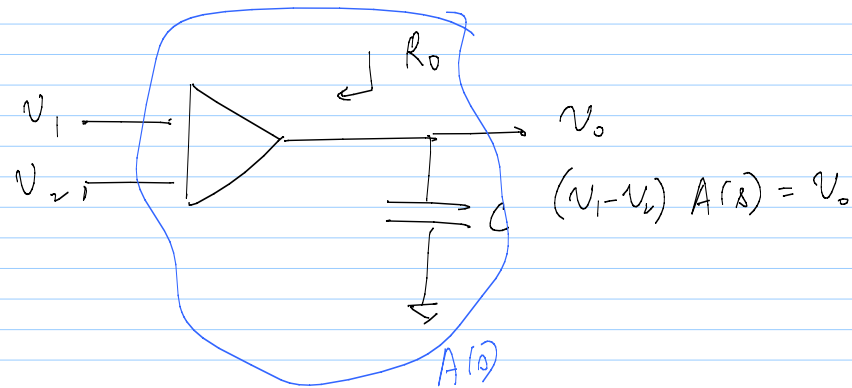
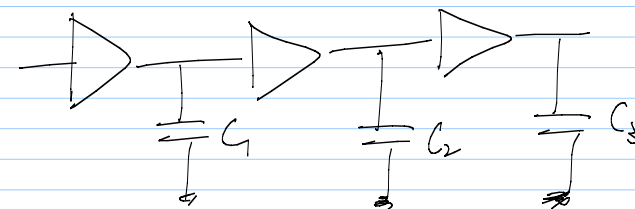
$$\frac{v_o}{v_s} = -g_m (r_{ds} \parallel R_L)$$

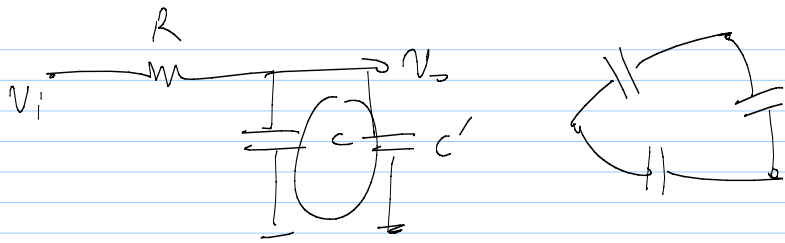
When $R_L = \infty$, $\frac{v_o}{v_s} = -g_m r_{ds}$ (Intrinsic gain)

* Limit on max. intrinsic gain

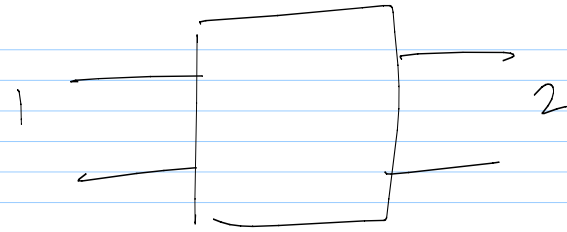
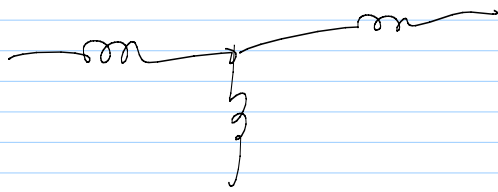


capacitive elements

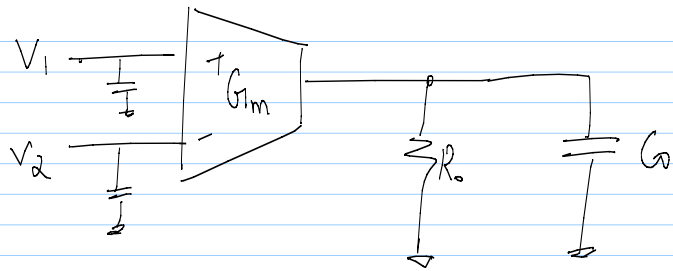
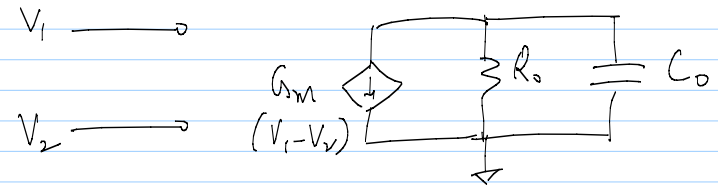




order = # of $(L+C)$ - # all cap. loops
 - # all inductor nodes



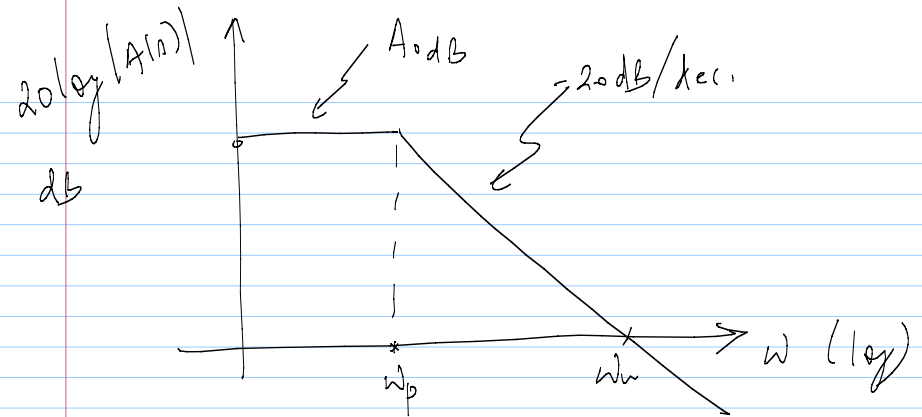
$$H(s) = \frac{N(s)}{D(s)} \leftarrow \text{degree}$$



Low freq. gain $A_o = G_m R_o$

$$A(s) = \frac{A_o}{1 + s/\omega_p}$$

$$|\omega_p| = \frac{1}{R_o C_o}$$



$$\omega_u = A_o \cdot \omega_p$$