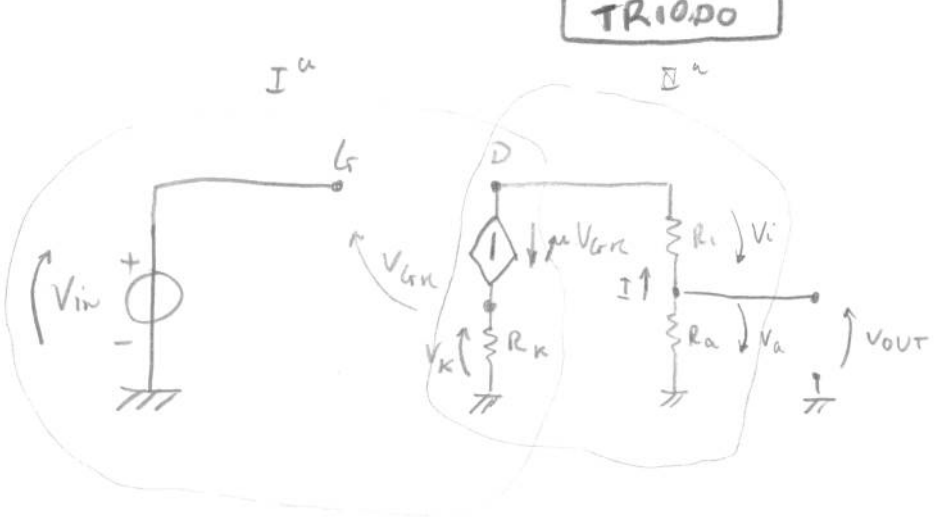
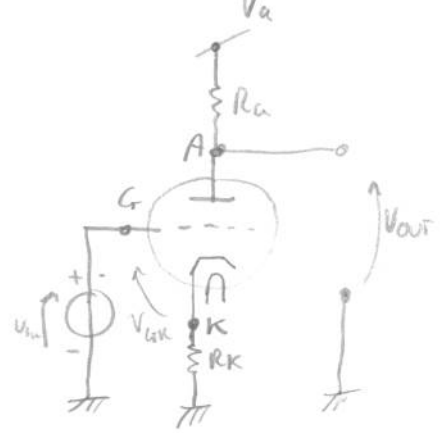
TRIODO





I^a maglia $\quad V_{in} = V_{GK} + V_K \Rightarrow \quad V_{GK} = V_{in} - R_K I$

II^a maglia $\quad V_K + V_i + V_a = V_{GK} \Rightarrow I\left(R_K + R_i + R_a\right) = \mu V_{GK} = \mu\left(V_{in} - R_K I\right)$

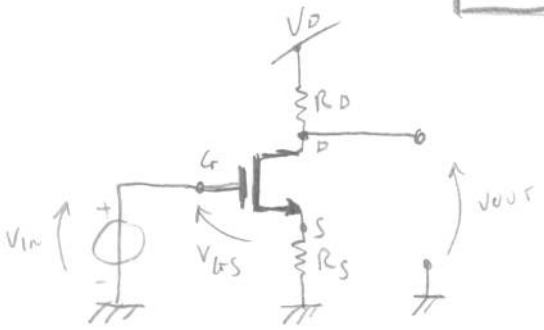
$$I\left(R_K + R_i + R_a + \mu R_K\right) = \mu V_{IN} \quad \Rightarrow \quad I = \frac{\mu V_{IN}}{R_K + R_i + R_a + \mu R_K}$$

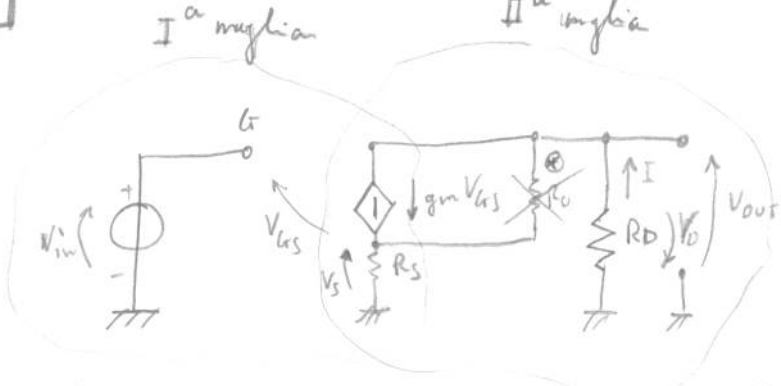
$$V_{OUT} = -V_a = -R_a I = -\frac{\mu V_{in} R_a}{R_i + R_a + R_K(1+\mu)}$$

$$A = \frac{V_{OUT}}{V_{in}} = -\mu \frac{R_a}{R_i + R_a + R_K(1+\mu)} \qquad (\text{INVERTENTE})$$

$$\lim_{\mu \to \infty} A = -\frac{R_a}{R_K} \qquad (\text{COINCIDE CON } \mu \text{ INFINITO})$$

MOS





Per semplicità non consideriamo la modulazione di canale $\Rightarrow \lambda = 0\,V^{-1} \Rightarrow R_o = \infty$

I^a) $\quad V_{in} = V_{GS} + V_S \Rightarrow \quad V_{GS} = V_{in} - R_S I$

II^a) $\quad V_S + V_D = V_{GS} \Rightarrow \quad I\left(R_S + R_D\right) = g_m V_{GS} = g_m\left(V_{in} - R_S I\right)$

$$I\left(R_S + R_D + g_m R_S\right) = g_m V_{IN} \quad \Rightarrow \quad I = \frac{g_m V_{IN}}{R_S + R_D + g_m R_S}$$

$$V_{OUT} = -R_D I = -\frac{g_m V_{IN} R_D}{R_D + R_S(1+g_m)}$$

$$A = \frac{V_{OUT}}{V_{in}} = -g_m \frac{R_D}{R_D + R_S(1+g_m)}$$