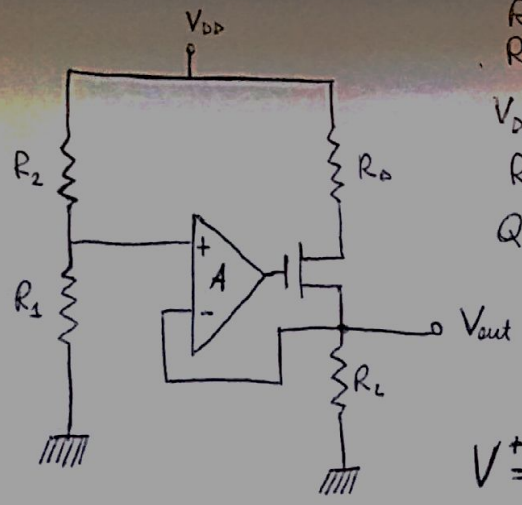
03/02/2010



$R_2 = 7k\Omega$
$R_1 = 3k\Omega$
$V_{DD} = 10V$
$R_D = R_L = 6k\Omega$
$Q = \begin{cases} k = \frac{1}{8}\frac{mA}{V^2} \\ V_t = 1V \end{cases}$

Ampl. $L^+ = |L^-| = 10V$

$$V^+ = V_{DD}\frac{R_1}{R_1+R_3} = 10\cdot\frac{3}{10}V = 3V$$

$V_{out} = 3V$

$$V^+ - R_L I_D = \emptyset$$

$$3 - R_L I_D = \emptyset \Rightarrow I_D = 0{,}5\,mA$$

Cerchiamo V_4

$$I_D = \frac{1}{8}(V_4 - 3 - 1)^2 = 0{,}5\,mA = \frac{1}{8}(V_4 - 4)^2$$

$$V_4^2 + 16 - 8V_4 = -4 = \emptyset$$

$$V_4^2 - 8V_4 + 12 = \emptyset$$

$$V_{4_{1,2}} = 4 \pm \sqrt{16-12} = 4 \pm 2 \begin{cases} 6 \\ 2 \end{cases}$$

$V_4 = 6V$ perché

$V_4 - V_S = V_{4S} = 3V > V_t \quad 3V > 1V$

$V_{DD} - R I_D = V_D = 7V$

$V_{DS} = V_D - V_S = 7 - 3 = 4V$

ok perché

$V_{DS} > V_{4S} - V_t$

$4V > 2V$